Hands On: DIGITAL CAMERA Breakthrough **First 3-GIGAHERTZ PCs**

PC WORLD

JANUARY 2003 • TECHNOLOGY ADVICE YOU CAN TRUST™ • AOL KEYWORD: PCWORLD • WWW.PCWORLD.COM

Lab Tests of 10 Picture-Perfect **Photo Printers,** From $79 to $700

Faster for Free! **Quick PC Tune-Up** Tips That Won't Cost You a Dime

Phone, Web, and E-Mail: Which **Wireless Devices** Really Deliver?

WHAT'S HOT FOR 2003

SAMSUNG
3 Messaging
Call History

NEW PCs, WEB TOOLS, SOFTWARE, GADGETS & MORE

PRINTED IN USA ▼ $6.99

www.gateway.com/digitalzone/photopro

Digital photo solutions

Gateway's 500s Photo PC system is tailor-made for managing and storing your photos — from the 6-in-1 card reader to the huge 80GB hard disk and color-accurate monitor, to the little details like the included Adobe® Photoshop® Elements 2.0 software. Accept no substitutes; a real Gateway® Photo PC along with a photo printer and digital camera for real photographers.

$299.99

Epson® Stylus 925 Inkjet Photo Printer

Professional photo lab-quality images

- Up to 5760 X 720 dpi resolution
- Prints up to 8ppm, 4 x 6 color photos
- True BorderFree™ 4 x 6, 5 x 7, 8 x 10 and letter-size photo printing with automatic roll paper cutter
- 6-Color demand Micro Piezo™
- One black & one color ink cartridge
- Free 50 pack of 4 x 6 photo paper, a $15 value

$1298

Gateway 500S PHOTO PC

- Intel® Pentium® 4 Processor 2.00GHz
- 256MB DDR SDRAM
- 80GB 7200RPM Hard Drive
- 40x/12x/48x CD-RW Drive
- VX930 19" color monitor (18" viewable)
- Microsoft® Windows® XP
- Integrated Audio
- GCS 300 speakers
- Gateway Mid Tower Case
- 10/100 Ethernet
- *Survive and Thrive* Training‡
- Dazzle 6-in-1 reader
- Adobe Photoshop Elements 2.0

intel inside pentium 4

$179.99

Epson Stylus 825 Inkjet Photo Printer

Print photos with or without a PC.

- 5760 x 720 optimized dpi
- Prints up to 8ppm black and color
- True BorderFree 4 x 6, 5 x 7, 8 x 10 and letter-size photo printing
- USB cable included, a $10 value
- Free 50 pack of 4 x 6 photo paper, a $15 value

$199.99

HP® PhotoSmart 7350 Inkjet Photo Printer

- Sharp detail and color
- Up to 4800 optimized dpi resolution
- Print speed up to 17ppm black, up to 13ppm color
- Resists fading twice as long as most traditionally processed photos — up to 65 years
- One black and one color ink cartridge
- Free 50 pack of 4 x 6 photo paper, a $15 value

$449.99

Minolta® DiMAGE F100

4-megapixel quality in a compact camera

- 3X optical zoom and 2.5X digital zoom
- 4.00-megapixel effective resolution
- 6MB Secure Digital™ memory card

$799.99

Canon® Powershot G3 Digital Camera

Unsurpassed image quality, advanced features, easy operation

- 4.0-megapixel CCD
- High-speed 4X optical zoom
- Rechargeable Lithium Ion battery, wireless remote control included
- 32MB CompactFlash™ Card

$399.99

FujiFilm® FinePix 3800 Zoom Digital Camera

6X optical zoom brings the action up close

- 3.20-megapixel CCD
- 6X optical zoom and 2.5X digital zoom
- 16MB xD Picture Card

| 1-800-424-1462 | www.gateway.com |

Gateway™
A better way.℠

Gateway recommends Microsoft® Windows® XP.

Advertised merchandise and in-store configuration may not be available at all store locations or through all sales channels. Prices and configurations subject to change without notice or obligation. Prices exclude shipping, handling and taxes (if applicable).

Gateway has great gifts

for everyone on your list.

www.gateway.com/digitalzone/music

Digital music solutions

This PC was designed with digital music in mind. It has enough storage to hold more than 1000 CDs of encoded music and includes everything you need to turn your PC into the ultimate ripping, mixing and CD-burning machine. Pick up a Creative® NOMAD® MP3 player or Jukebox 3 to get the most out of your digital music experience.[9]

$999

Gateway® 500s Music PC

- Intel® Pentium® 4 Processor 2.00GHz
- 256MB DDR SDRAM
- 60GB 7200RPM Hard Drive
- 40x/12x/48x CD-RW Drive
- EV700 17" Color Monitor
- 10/100 Ethernet
- Microsoft® Windows® XP
- Sound Blaster Audigy with FireWire
- Boston Acoustics® BA745 Speakers w/Subwoofer
- CD Creator Pack

$99.99 after rebate[1]

($114.99 - $15 mail-in rebate = $99.99. Good from 11/27 - 12/27/02.)

Creative NOMAD MuVo™ MP3 Player/USB Drive

- Incredibly easy to use – no software or cables required!
- Ultracompact and extremely lightweight
- Up to two hours of skip-free music playback
- Doubles as a USB drive that can hold 64MB of pictures, documents or presentations

$299.99 after rebate[2]

($349.99 - $50 mail-in rebate = $299.99. Good from 11/27 - 12/27/02.)

Creative NOMAD Jukebox 3

- Carry up to 8,000 songs in the palm of your hand!
- FireWire interface for lightning-fast file transfers
- Appears on your computer desktop as a 20GB hard drive

www.gateway.com/digitalzone/video

Digital video solutions

The 700s Movie Creator PC has it all to make your own DVD movies, including IEEE 1394 FireWire® interface and cables to connect a digital video camcorder, large hard drive for video storage, award-winning Pinnacle® Studio Version 8 movie-making software, DVD/CD recorder, blank media and CD Stomper® kit to make your own video CD and DVD movies. To complete your digital video experience, purchase a Canon® Digital Video Camcorder so you can transfer your old home footage from analog camcorder into the PC and mix it into your new movies.[9]

$1499

Gateway 700s Movie Creator PC

- Intel® Pentium® 4 Processor 2.40GHz w/512K L2 Cache
- 256MB RDRAM®
- 80GB 7200RPM Hard Drive
- DVD-RAM/-R/CD-RW Drive
- 15" LCD Flat Panel Monitor
- Microsoft® Windows® XP
- Sound Blaster Audigy Audio with IEEE 1394 FireWire
- Boston Acoustics BA745 Speakers w/Subwoofer
- Movie Creator VCD/DVD

$499.99 with PC purchase

Canon ZR45

Digital Video Camcorder

- 18X optical, 360X digital zoom
- Color night-shooting mode
- Image stabilizer
- 8MB memory card for digital photos
- $599.99 regular price

$799.99 with PC purchase

($999.99 regular price; $899.99 after $100 Canon mail-in rebate)

Canon Elura 40

Digital Video Camcorder

- Four shooting modes: digital video, digital photo, XGA (1024 x 768 pixels) photos, motion JPEG
- 8MB memory card for digital photos
- $899.99 regular price
- One of the smallest camcorders in the industry

$99.99 with PC or Digital Camcorder purchase

Movie Creator VCD/DVD

- Pinnacle Studio Version 8
- 1394 FireWire cables
- Blank CD and DVD media and CD/DVD Stomper Pro Kit
- *Capture, Create and Share* digital movie book and CD training[6]
- $199.99 regular price

'Tis the season to give cool stuff.

$3499

Gateway® 700XL

- Intel® Pentium® 4 Processor with HT Technology 3.06GHz
- 512MB RDRAM® PC1066
- 128MB ATI Radeon 9700G AGP Graphics
- 400GB Storage
- 19" LCD Flat Panel Display
- Gateway Tower
- Floppy Drive
- 48X CD-RW
- DVD-RAM/-R/CD-RW Drive
- Sound Blaster Audigy Audio w/IEEE 1394 FireWire®
- Boston Acoustics® BA7800 Speakers with Subwoofer and Surround Sound
- Digital SST's w/SUR
- 56K Voice Modem
- 10/100/1000 Ethernet
- Wireless Keyboard
- Wireless Optical Mouse
- 1 Year America Online® internet access (creation of new account required)
- Microsoft® Windows® XP Home Edition

Intel® Pentium® 4 Processor with HT Technology 3.06GHz gives you the power to do more at once.

Introducing the world's first high quality, affordable Plasma TV from Gateway.

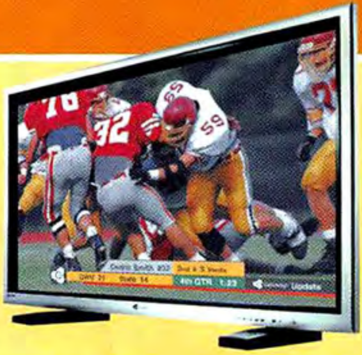
The Gateway 42" wide-screen Plasma TV gives you a crisp, bright and amazingly clear picture in an ultrathin, wall-mountable design.

$2999

Gateway Plasma Digital TV

- 852 x 480 native pixel with progressive scan
- 16:9 wide-screen aspect ratio
- Built-in speakers and NTSC tuner
- Ultrathin (less than 4" deep), wall-mountable
- Remote control, tabletop stand
- 1-year limited warranty[1]

Delivery, installation and service plans available.[1]



| 1-800-424-1462 | www.gateway.com |

Gateway™
A better way.℠

Gateway recommends Microsoft® Windows® XP.

Advertised merchandise and in-store configuration may not be available at all store locations or through all sales channels. Prices and configurations subject to change without notice or obligation. Prices exclude shipping, handling and taxes (if applicable). [1]Limited warranties and service agreements apply; visit gateway.com or call 1-800-846-2000 for a free copy. [2]TO AVOID BEING CHARGED A MONTHLY FEE, CANCEL BEFORE PROMOTIONAL PERIOD ENDS. Promotional period begins 30 days from receipt of system. You may incur surcharges even during promotional period for premium services, or long distance charges on your phone bill, depending on location and calling plan. Communication surcharges may also apply with some access numbers and in AK. For details and access numbers call 1-800-846-2000. Check with your local phone company to determine whether the access number you select is a local call for your calling plan. New U.S. members 18 and older only. Major credit card or checking account required. Use may be limited, especially during peak usage.

$1499

Gateway® Profile® 4x

The all-new Gateway Profile 4 all-in-one PC.

- 17" TFT LCD Display
- Intel® Pentium® 4 Processor 2.40GHz
- 256MB DDR SDRAM
- 80GB 7200RPM Hard Drive
- 24X CD-RW/DVD-ROM Drive
- Integrated 10/100 Ethernet
- Microsoft® Windows® XP Home Edition
- 1-Year Limited Warranty[1]

Sign up for broadband and save up to $260 when you buy any Gateway PC with a Pentium® 4 processor.[7]

$999

Gateway 1450SE Notebook

- 14.1" XGA TFT Active-Matrix Display
- Mobile Intel® Celeron® Processor 1.33GHz
- 256MB SDRAM
- 30GB Ultra ATA Hard Drive
- Integrated DVD/CD-RW Combo Drive
- Internal V.92 56K Modem[3] and 10/100 Ethernet
- Microsoft® Windows® XP Home Edition
- 1-Year Limited Warranty[1]

$1499

Gateway 400x Notebook

- 15" XGA TFT Active-Matrix Display
- Intel® Pentium® 4 Processor 2.40GHz
- 256MB DDR SDRAM
- 30GB Ultra ATA Hard Drive
- Integrated DVD/CD-RW Combo Drive
- Internal V.92 56K Modem[3] and 10/100 Ethernet
- Internal IEEE 1394 FireWire®
- Microsoft Windows XP Home Edition
- 1-Year Limited Warranty[1]

$1299

Gateway 400s Notebook

- 14.1" XGA TFT
- Intel® Pentium® 4 Processor 2.00GHz
- 256MB DDR SDRAM
- 30GB Ultra ATA Hard Drive
- Integrated DVD/CD-RW Combo Drive
- Internal V.92 56K Modem[3] and 10/100 Ethernet
- Internal IEEE 1394 FireWire
- Microsoft® Windows® XP Home Edition
- 1-year Limited Warranty[1]

Gateway recommends Microsoft® Windows® XP Professional for Mobile Computing.

Advertised merchandise and in-store configuration may not be available at all store locations or through all sales channels. Prices and configurations subject to change without notice or obligation. Prices exclude shipping, handling and taxes (if applicable). Not responsible for typographical errors. [1]Limited warranties and service agreements apply; visit gateway.com or call 1-800-846-2000 for a free copy. [2]For more information about rebate offer, log onto www.gateway.com/rebate or call 1-800-846-4208. [3]Maximum data transfer rate dependent upon multiple variables. [4]TO AVOID BEING CHARGED A MONTHLY FEE, CANCEL BEFORE PROMOTIONAL PERIOD ENDS. Promotional period begins 30 days from receipt of system. You may incur surcharges even during promotional period for premium services, or long distance charges on your phone bill, depending on location and calling plan. Communication surcharges may also apply with some access numbers and in AK. For details and access numbers call 1-800-846-2000. Check with your local phone company to determine whether the access number you select is a local call for your calling plan. New U.S. members 18 and older only. Major credit card or checking account required. Use may be limited, especially during peak usage. [5]Delivery required for an additional fee. Installation provided by third parties and not available in all areas. Contact a Gateway sales rep for details. [6]Online training: Instructor-led courses subject to availability. Course material purchase and Internet access required. In-store training: Courses subject to change, may vary by location and are not offered as vocational or job training. Club memberships non-transferable. Refunds not allowed for upgrades. All training: Gateway training is not offered as vocational or job training. [7]Savings based on total cost of cable modem, installation and promotional period of broadband service, which are all included with offer. These costs vary by market and customer's actual savings will depend on the provider offerings available in their area. Offer available to new broadband cable residential customers located in broadband cable wired and serviceable areas only. Call 1-800-846-2000 for details. [8]Hyper-Threading Technology requires a computer system with an Intel Pentium 4 processor at 3.06GHz or higher, a chipset and BIOS that utilize this technology and an operating system that includes optimizations for this technology. Performance will vary depending on the specific hardware and software you use. See www.intel.com/info/hyperthreading for information. [9]Respect musicians — respect their copyrights. Copyright ©2003 Gateway, Inc. All rights reserved. Gateway Terms and Conditions of Sale apply. Gateway.com and Gateway Country Stores, LLC, are separate legal entities. Gateway, the Spotted G Gateway Logo, the Spotted G Logo, the Black-and-White Spot Design, Gateway Profile and "A better way." are trademarks or registered trademarks of Gateway, Inc. in the U.S. and other countries. The Intel Inside Logo, Intel, Pentium and Celeron are registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. America Online and AOL are registered servicemarks of America Online, Inc. All other brands and product names are trademarks or registered trademarks of their respective companies. Ad: Arnell Group Ad Code: 060298

SYS
PLEXWRITER

Get $50 off
on each
custom PC.*

For Custom PC Systems:
Please call 1-800-613-9963, or visit www.sys.com

SYS®

SINCE 1988

Put your trust in a PC with proven power and reliability

SYS International (SYS Technology) has been an industry leader in high performance PCs and workstations since 1988. SYS PCs have been out performing the competition year after year, breaking industry benchmarks, while establishing SYS as a leader in technological excellence. In fact, SYS TaskMaker and SYS Performance systems have been on *PC World's* Top Charts for 46 of the last 48 months. With an arsenal of high-quality parts and accessories, SYS PCs surpass the standards of today, while meeting the requirements of tomorrow. Equipped with powerful AMD™ and Intel® processors, SYS PCs offer brut power and complete reliability even when running the most advanced applications.

SYS LCD Monitors have the features you want at a price you deserve

SYS LCD Monitors are available in 15", 17", and 18" sizes. SYS LCD Monitors are technologically advanced, energy saving, and are accented by an eye-pleasing blue-silver casing. SYS LCD Monitors offer the highest quality at a competitive price. So, if you are buying for a large corporation, government agency, educational institution or a savvy end-user who demands the very best in excellence and affordability, it makes sense to explore the great LCD Monitors that SYS has to offer.

To compliment SYS' high-performance systems, we have added high-quality SYS LCD Monitors. Our 17" model includes an active matrix TFT display, 0.264 x 0.264 mm pixel pitch, 1280 x 1024 resolution, and integrated speakers. It is even wall-mountable. Complete systems, including a 17" SYS LCD Monitor, begin at under $1100.

Whether your computer needs range from novice to expert, SYS can deliver a complete package with:

- High performance for maximum efficiency and effectiveness
- Customization for today's diverse needs
- A great warranty and world-class customer support

An affordable leasing program is available. Consumer credit financing is coming soon. Please inquire.

* Mention this ad and receive $50 off your purchase of a SYS system costing over $999. Offer valid for online and telephone orders placed from January 1 through February 28, 2003.

SYS LCD monitors are available at these fine retailers or websites:

OfficeMax, Inc.
www.officemax.com

J&R Computer World
www.jandr.com

Nebraska Furniture Mart
www.nebraskafurnituremart.com

RCS Computer Experience
www.rcseshop.com

American TV & Appliances
www.americantv.com

Wolfe's Camera, Camcorder, Computer
www.wolfes.com

Stereo Advantage
www.stereoadvantage.com

Marine Corps Exchange
www.usmc.mil

TigerDirect, Inc.
www.tigerdirect.com

PC Mall, Inc.
www.pcmall.com

PC Connection, Inc.
www.pcconnection.com

The SYS logo, SYS Technology, and SYS Performance are registered trademarks of SYS International. All the other trademarks are acknowledged as the property of their respective owners.

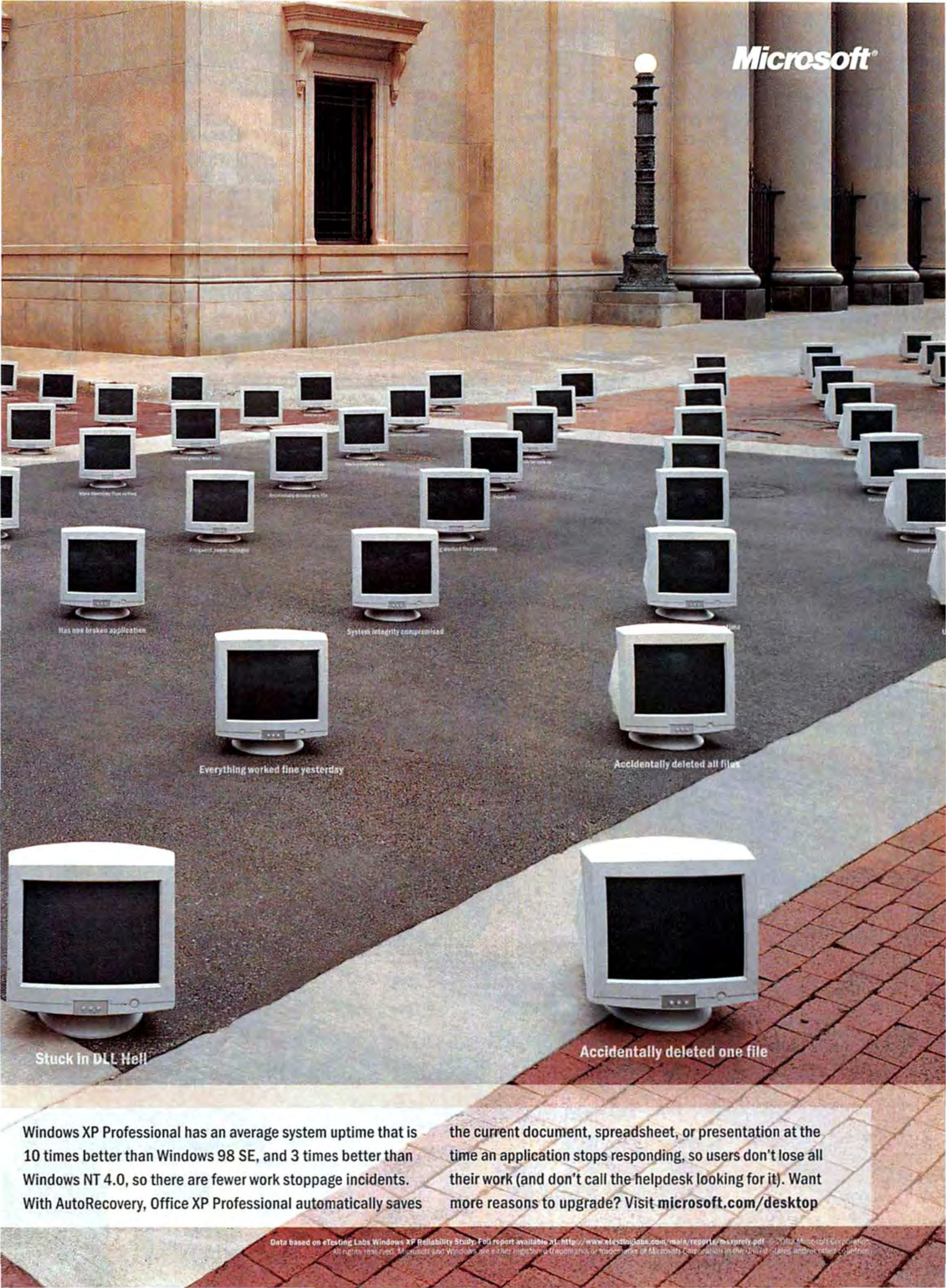
For Information on SYS LCD Monitors:

Please call 1-866-613-9963, or visit www.syslcd.com

...ssages
Needs full back-up
Maddening error messages
...o restore critical data
Installed games. Won't boot
Needs partial back-up
Annoying error messages
...e driver
System crashed on unsaved document

Managing desktop reliability can be challenging.
That's why there's Windows XP and Office XP.

Recognize any of those issues? Or, perhaps, all of them? We thought so. That's why we've made Microsoft® Windows® XP Professional and Microsoft Office XP Professional the most reliable desktop we've ever built. Want specific examples?


Microsoft
Has one broken application
System integrity compromised
Frequent power outages
Accidentally deleted any file
Everything worked fine yesterday
Accidentally deleted all files
Stuck in DLL Hell
Accidentally deleted one file

Windows XP Professional has an average system uptime that is 10 times better than Windows 98 SE, and 3 times better than Windows NT 4.0, so there are fewer work stoppage incidents. With AutoRecovery, Office XP Professional automatically saves the current document, spreadsheet, or presentation at the time an application stops responding, so users don't lose all their work (and don't call the helpdesk looking for it). Want more reasons to upgrade? Visit **microsoft.com/desktop**

Data based on eTesting Labs Windows XP Reliability Study. Full report available at: http://www.etestinglabs.com/main/reports/msxprely.pdf © 2002 Microsoft Corporation. All rights reserved. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

RROUND SOUND
BEST BUY
On the Fun
OVIES
NEW TEC
ROCKY
ROCKY COLLECTION

Get the *Rocky Collection* on DVD at Best Buy.

From DVD movies to DVD players, even plasma TVs.
You'll find something fun for everyone.

BEST BUY

Turn On the Fun®
BestBuy.com™

$2 Off any MGM DVD

© 2003 MGM

Look for the special MGM movie section in most Best Buy stores.

BEST BUY
© 2003 Best Buy

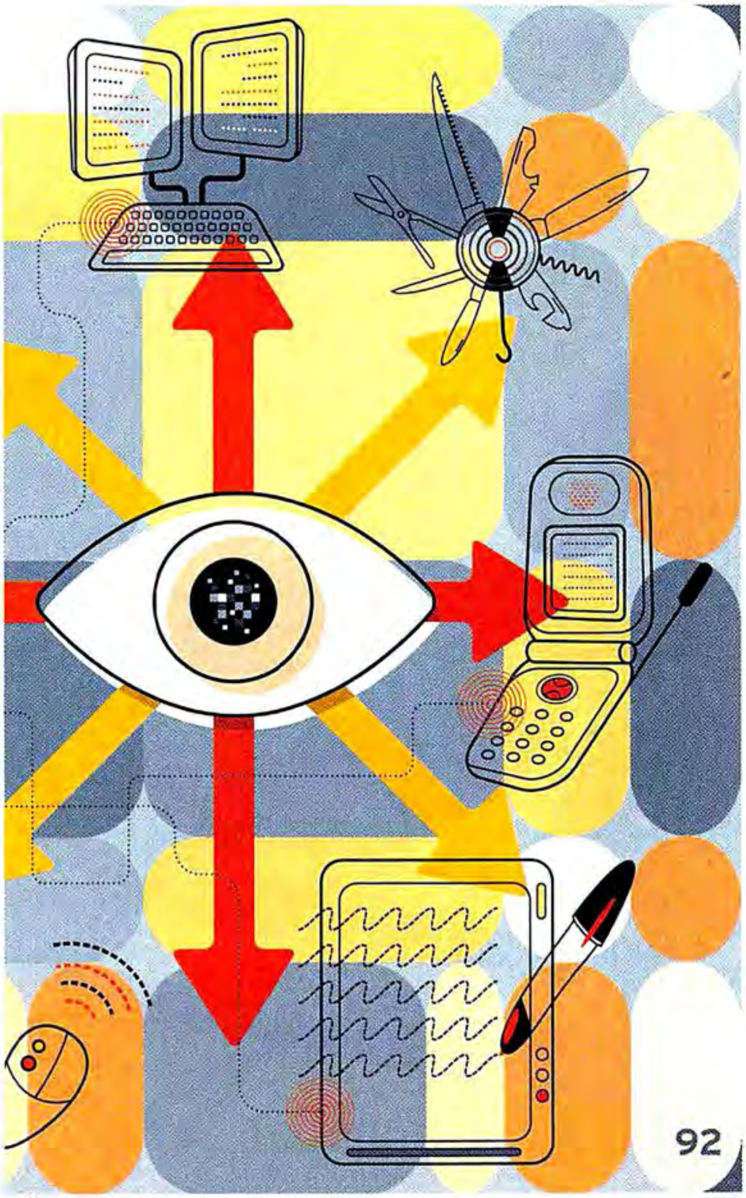
Good only at Best Buy retail stores in the United States. Not good in combination with other coupons or offers. Limit 1 coupon per title per customer. Limit1 DVD. Not valid on prior purchases. Valid on in-stock items only; no rainchecks. No dealers. Coupon must be presented at time of purchase. No copies. Coupon value is 1/100 of one cent. Good through 3/30/03. **Cashier Instructions:** Scan coupon UPC. Scan qualifying product UPCs. Scan all other product(s) being sold. Press "Total." Select "Yes" to apply package pricing. Write "VOID" on the coupon and place in the register coupon media file. Valid on 1 MGM title per customer. One-time use only.

4 00048 89179 8

© 2003 Best Buy

PC WORLD

JANUARY 2003
VOLUME 21 ◆ NUMBER 1
AOL KEYWORD: PCWORLD
WWW.PCWORLD.COM



COVER STORY

92 What's Hot for 2003

With the new year upon us, it's time to take a look at what's in store. Our survey of digital technology brings you up to speed on everything from split-level notebooks to Blu-ray DVDs to five varieties of 802.11 standards. Get ready for a PDA-size computer, a clever digital pen, and AMD's long-awaited Clawhammer CPU. Plus powerful digital cameras, big cheap LCDs, and more.

Cover Photography by Marc Simon

FEATURES

INK JET PRINTERS

106 Image Makers

Do you need a specialized ink jet to print great photos, or can a general-purpose unit do just as well? We test several examples of each type to find out.

PC TUNE-UP

123 Faster for Free

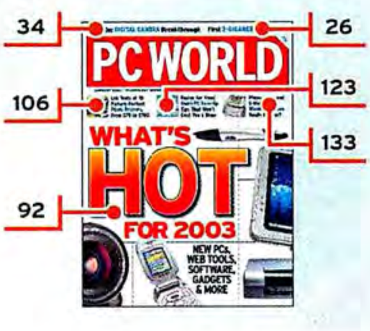
The right Windows settings, drivers, and utilities can boost your PC's performance—without costing you a dime. To get more out of your system, delve into these slick tricks and tools, take a crash course in drivers' ed, and find the most helpful software.

MOBILE WEB

133 The New (Improved?) Wireless Web

If you frequently conduct business on the go, you might be tempted to invest in one of the latest Wi-Fi or 3G Web-connected devices. Our writer went hands-on with six products to determine whether the promise of the mobile Internet is finally a reality.

ON THE COVER



SAMSUNG
DigitAllchampions
240T
172T
765MB

BusinessWeek ranks Samsung #1 Global Technology Leader.

THE INFO TECH 100 AWARD
BusinessWeek

Need first-rate monitors? You need Samsung. Nobody offers a wider selection. From multi-functional LCDs to flat-screen CRTs such as our exclusive MagicBright™ series. And they're all just one call away. So for the latest monitor innovation and world-class reliability, just do what they did at *BusinessWeek*. And put us on the top of *your* list.

To learn more about Samsung monitors visit us at **www.samsungusa.com/monitor** or call **1-800-SAMSUNG.**

©2003 Samsung Electronics America, Inc.; Samsung, MagicBright, and Samsung Digitall everyone's invited are registered marks of Samsung Electronics Corp. Ltd. *BusinessWeek* Information Technology Annual Report, June 2002.

SAMSUNG DIGITall
everyone's invited™

TOP 100

138 **Mobile P4 Speeds Up**
New laptops impress.
140 **Top 15 Desktop PCs**
144 **Top 15 Notebook PCs**
147 **Top 10 Monitors**
148 **Top 10 CD-RW Drives**
149 **Top 10 Graphics Boards**
150 **Top 10 Digital Cameras**
151 **More Reviews**

DEPARTMENTS

23 **Up Front**
51 **Letters**
55 **Plugged In**
Desktop prices plummet; pop-up ads begin to fade.
59 **Consumer Watch**
A dozen annoying things that companies could easily fix if they really wanted to.
65 **Home Office**
USB 2.0: The new, easy way to upgrade—outside the box.
67 **Bugs and Fixes**
Fresh Microsoft patches.
182 **Full Disclosure**
Progress? Not this year.

RESOURCES

18 **How to Contact PC World**
170 **PC World Marketplace**
180 **Advertiser Index**

59

138

65

NOW AT PCWORLD.COM

DOWNLOADS

Utilities to Erase Files

Enhance your security by removing all traces of unwanted files.
find.pcworld.com/32174

REVIEWS

How to Buy a Hard Drive

The same money buys twice as big a hard drive now as last year.
find.pcworld.com/32177

COMING UP IN FEBRUARY

Networking Guide: We pick the best wireless gateways and share tips on optimizing your network. **Large, Low-Cost LCDs:** Prices for 19-inch displays are falling. We review a slew of new models to find the best quality for the money. **Buyer Beware:** We expose questionable sales tactics and tell you how to avoid getting burned. **Fast Facts:** Fifty ways to find useful information on the Web.

NEWS & TRENDS

26 **Two CPUs in One?**
TEST Center Intel's 3.06-GHz Pentium 4 CPU introduces hyperthreading, which lets one processor act like two on certain tasks. The PC World Test Center ran three systems equipped with the chip—along with two competing PCs—through arduous tests, with wildly varying results.
34 **Mixed Verdict on Photo Sensor**
Sigma's SD9 3.4-megapixel digital camera is the first to use Foveon's X3 image sensor, which promises sharper, more color-accurate photos.
40 **Microsoft's Next Office**
Aside from an overhauled Outlook, Office 11's main changes involve enhanced XML support.
42 **Wi-Fi Projectors: Keep the Cables**
Four Wi-Fi–enabled portable projectors struggle to turn presentations into high-wireless acts.

NEW PRODUCTS

74 **Digital Cameras**
Canon PowerShot S230 Digital Elph, Fujifilm FinePix F402, Sony Cyber-shot DSC-U20
76 **PDAs**
Dell Axim X5, Palm Zire, Royal Linea16, ViewSonic Pocket PC V35
78 **Notebook**
Best Buy VPR Matrix 200A5
86 **Disk Imaging**
Symantec Norton Ghost 2003
88 **Disk Utility**
PowerQuest PartitionMagic 8

See page 75 for a complete list of new products reviewed.

HERE'S HOW

156 **Windows Tips**
Customize your desktop with a theme; apply a skin to Media Player; make PDF files at no cost.
160 **Internet Tips**
Protect your privacy by clearing your browser's cookies and history; stop pop-ups with Mozilla.
162 **Step-By-Step**
Activate crucial antivirus-software settings to ensure that your system is completely protected.
164 **Hardware Tips**
All about Windows System Monitor; screen longevity; the Windows XP compatibility list.
166 **Answer Line**
Transport files between home and work PCs; set up a system password in Windows XP; save Windows updates; record and play back macros.

InFocus X1 projector

InFocus
CORPORATION

$1599.00
CDW 432163

- DLP™ and DCDi technology
- 1000 ANSI lumens
- Contrast ratio: 2000:1
- Weight: 6.8 lbs.
- 2-year limited parts and labor, 90-day lamp warranty

NEC/Mitsubishi MultiSync LCD1700NX-BK

NEC/MITSUBISHI

$649.99
CDW 395060

- 17" viewable image size
- Maximum resolution: 1280 x 1024 at 60Hz
- Contrast ratio: 300:1
- 3-year limited parts, labor and backlight warranty

Canon S900 photo printer

Canon

$299.00
CDW 363082

- Resolution: 2400 x 1200 dpi
- Print speed: Borderless 4" x 6" photos in approximately 37 seconds
- Advanced Microfine Droplet Technology™
- Paper handling: 100-sheet multipurpose tray
- USB port
- 6 individual ink tanks reduce waste
- Photos lightfast for approximately 25 years
- 1-year limited parts and labor warranty

Sharp Notevision M20X projector

SHARP
FROM SHARP MINDS COME SHARP PRODUCTS™

$2699.00
CDW 388491

- 1024 x 768 XGA projector
- 1900 ANSI lumens
- Contrast ratio: 800:1
- Dimensions: 8.62"(W) x 3.25"(H) x 12.5"(D)
- Weight: 5.8 lbs.
- Zoom Lens
- 3-year limited parts and labor, 90-day lamp warranty

CDW The Right Technology. Right Away.™

CDW.com
800-306-4239

CDW: Not just great technology, the right technology.

Microsoft

SONY

TOSHIBA

COMPAQ

EPSON

SimpleTech

SHARP

APC
Legendary Reliability

Sun microsystems
iForce™ Partner

Sun Fire™ V100 rack-optimized server

- 500MHz Sun UltraSPARC® IIe processor
- Memory: 128MB
- 40GB hard drive
- 24X Max CD-ROM drive
- Two 10/100 Ethernet adapters
- Solaris™ 8 operating system

$995.00
CDW 369087

MicronPC TransPort GX3

micronpc

- 1.7GHz Mobile Intel® Pentium® 4 Processor-M
- Memory: 256MB
- 40GB hard drive
- CD-RW/DVD-ROM combo drive
- 56Kbps modem
- 10/100 Ethernet
- 15" SXGA+ active-matrix display
- Windows 2000 Professional

$2149.95
CDW 423744

All pricing subject to change. For all prices and products, CDW® reserves the right to make adjustments due to changing market conditions, product discontinuation, manufacturer price changes or typographical errors in advertisements. All products sold by CDW are third party products and are subject to the warranties and representations of the applicable manufacturers. Please refer to CDW.com for additional terms and conditions.

©2003 CDW® Computer Centers, Inc. 200 N. Milwaukee Avenue, Vernon Hills, IL 60061 PCW9925 B/C 01/03

CDW
The Right Technology. Right Away.
Our account managers don't just know technology.
They get to know you.
800.306.4239
CDW.com

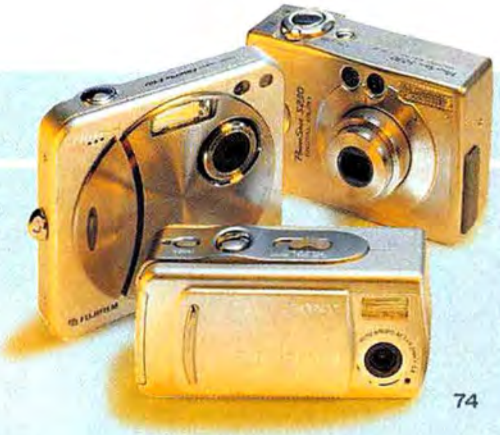
Great service starts with knowing what customers want. That's why if you're a CDW customer, you get the same account manager every time you call. Over time, that means they get to know your technology set-up and your needs. So our account managers are more responsive and more passionate about helping every Tom, Dan and Susan who calls. Because they know Tom, Dan and Susan personally. For more information, just call or visit our Web site.

© 2002 CDW Computer Centers, Inc.

FEATURED THIS MONTH

New Products and Services Covered in This Issue

A TRIO OF SMALLER, LIGHTER digital cameras with fairly generous megapixel resolutions are among the dozens of new products we examine in this issue. A complete list of the newcomers follows, along with each item's star rating, if any (some models are preproduction examples or are otherwise ineligible for a rating). Head to find.pcworld.com/10860 for details on *PC World*'s Star Ratings.



74

LITTLE SNAPPERS: Pocketable digital cameras from Canon, Fujifilm, and Sony.

DESKTOP PCs

142 Compaq Evo D510 Convertible Minitower ★★★★☆
140 Dell Dimension 4550 ★★★⯪☆
140 FreewayTech Velocity A333 ★★★★☆
142 Gateway E-6000 ★★★★☆
142 IBM NetVista M42 ★★★⯪☆
142 MicronPC ClientPro 325 ★★★☆☆
140 Polywell Poly 875VF-2800 ★★★★☆
140 Polywell Poly 884RF-2600 ★★★⯪☆

NOTEBOOK PCs

78 Best Buy VPR Matrix 200A5 ★★★★☆
144 Chem USA ChemBook 4025 ★★★☆☆
144 Dell Inspiron 8200 ★★★☆☆
144 Gateway 600XL ★★★⯪☆
144 Micro Express NP1020A ★★★☆☆
144 Sharp Actius GP20 ★★⯪☆☆
144 Toshiba Satellite Pro 6100 ★★⯪☆☆
100 Xentex Flip-Pad Voyager

INK JET PRINTERS

108 Canon I320 Color Bubblejet Printer ★★★⯪☆
108 Canon I550 Color Bubble Jet Printer ★★★⯪☆
108 Canon I850 Photo Printer ★★★⯪☆
108 Canon S530D Direct Connect Photo Printer ★★★★☆
108 Epson Stylus C62 ★★★☆☆
108 Epson Stylus Photo 960 ★★★★☆
108 Epson Stylus Photo 2200 ★★★★☆
108 HP Deskjet 3820 ★★★☆☆
108 HP Photosmart 7550 ★★★⯪☆
108 Lexmark Z55se Color Jetprinter ★★★☆☆

PROCESSOR

26 Intel 3-GHz Pentium 4

DIGITAL CAMERAS

74 Canon PowerShot S230 Digital Elph ★★★★☆
150 Casio QV-R4 ★★★⯪☆
74 Fujifilm FinePix F402 ★★★★☆
150 HP Photosmart 850 ★★★☆☆
94 Kyocera Finecam S5
150 Nikon Coolpix 4300 ★★★★☆
150 Nikon Coolpix 5700 ★★★★☆
94 Olympus Camedia C-50 Zoom
34 Sigma SD9
150 Sony Cyber-shot DSC-F717 ★★★★☆
74 Sony Cyber-shot DSC-U20

19-INCH CRT MONITORS

147 Compaq S9500 ★★★☆☆
147 Mitsubishi Diamond Pro 930SB ★★★★☆
147 Sony CPD-E440 ★★★⯪☆

LCD MONITORS

82 Samsung SyncMaster 191N ★★★⯪☆
82 WinBook Display C1900 ★★★★☆

CD-RW DRIVES

148 LG Electronics GCC-4320B ★★★⯪☆
148 LG Electronics GCE-8480B ★★★⯪☆
148 TDK 48X VeloCD ★★★★☆

GRAPHICS BOARDS

149 Asus AGP-V8170DDR ★★★⯪☆
149 ATI Radeon 9700 Pro ★★★★⯪
149 Crucial Technology Radeon 9700 Pro ★★★★⯪
149 Leadtek WinFast A250 Ultra TD-MyVIVO ★★★★☆

SOUND CARD

78 Creative Labs Sound Blaster Audigy 2 Platinum ★★★★⯪

PDAs & OTHER HANDHELDS

76 Dell Axim X5
134 Handspring Treo 300 ★★⯪☆☆
96 Logitech Io Pen
134 Kyocera 7135 ★★⯪☆☆
76 Palm Zire ★★★☆☆
97 PoGo Flipster
76 Royal Linea16 ★★★☆☆
134 Samsung A500 ★★☆☆☆
102 Tiqit Eightythree
134 T-Mobile Sidekick ★★★★☆
134 Toshiba E740 ★★★☆☆
76 ViewSonic Pocket PC V35 ★★★★☆

NETWORKABLE PROJECTORS

42 NEC LT260
42 Sharp Notevision PG-M25X
42 Sony SuperSmart VPL-PX15
42 Toshiba TLP-T501U

SOFTWARE & UTILITIES

80 Artera Turbo Residential ★★★☆☆
40 Microsoft Office 11
88 PowerQuest PartitionMagic 8 ★★☆☆☆
80 Propel Accelerator ★★★★☆
80 Proxyconn Accelerator ★★★⯪☆
86 Symantec Norton Ghost 2003 ★★☆☆☆

ONLINE SERVICES

90 **America Online** AOL 8 ★★★★☆
90 **Microsoft** MSN 8 ★★★⯪☆

©2002 Adobe Systems Incorporated. All rights reserved. Adobe, the Adobe logo, Tools for the New Work and Photoshop are either registered trademarks or trademarks of Adobe Systems Incorporated in the U.S. and/or other countries. Intel, Pentium and the Pentium 4 processor logo are trademarks or registered trademarks of Intel Corporation. *Prices may vary. Check your local retailer.

Adobe

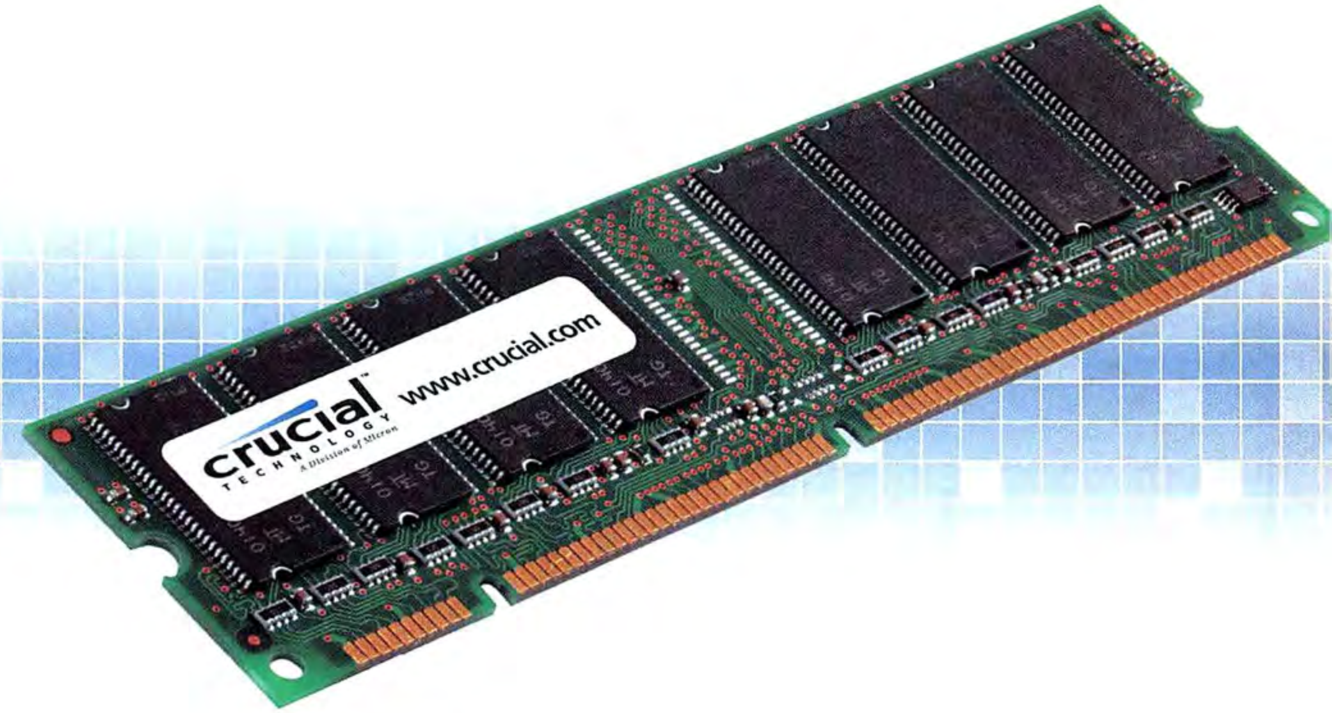
He's got his father's eyes.

Want to give someone a brand-new hairdo? Now you can with Adobe Photoshop Elements 2.0, a program that's been optimized to run on an Intel® Pentium® 4 processor. Photoshop Elements gives you some of the same image-editing tools the pros use for less than $100.* It's fun, easy and undoubtedly the best way to give your mother-in-law that nose she's always deserved.

Maximize your experience with pentium® 4

Adobe® Photoshop® Elements 2.0 | Tools for the New Work™

The world's leading computer companies buy memory from us.


crucial™
TECHNOLOGY
A Division of Micron
www.crucial.com

Order online:
www.crucial.com
or call toll-free: 1-888-363-2579

CRUCIAL.COM

Shouldn't you?

When you buy a memory upgrade from Crucial you're buying directly from Micron—one of the world's largest DRAM manufacturers and a major supplier to the global computing industry. Buying directly from the manufacturer gives you access to the highest quality products at the lowest possible prices, backed up by expert technical support and world-class customer service, and topped off with guaranteed compatibility and a limited lifetime warranty. It's that simple.

Order today and we'll ship it free!*

512MB PC133 SDRAM

\$57.79

for today's most popular systems

FREE SHIPPING*

*See Web site for details.

Price reflects an automatic 10% discount for ordering online. Prices may vary according to specific system requirements. The price listed was valid on 11/13/02 when we sent this ad to the publisher; however, prices may have dramatically increased or decreased since then. Visit the FAQ section of Crucial.com/uk to learn more about why memory prices go up and down.

© 2002 Micron Technology, Inc. All rights reserved. Micron Technology, Inc., is an authorized licensee of the CompactFlash™ and MultiMediaCard™ trademarks. The Memory Experts is a service mark and Crucial Technology, the Crucial logo and Micron are registered trademarks of Micron Technology, Inc. All other brands and names used herein are the property of their respective owners. Crucial Technology is a division of Micron Semiconductor Products, Inc., which is a wholly owned subsidiary of Micron Technology, Inc. Phone 208-363-5500. Fax 208-363-5501. E-mail crucial.sales@micron.com. Crucial Technology is not responsible for omissions or errors in typography or photography.

The Memory Experts℠

crucial™
TECHNOLOGY
A Division of Micron

PC WORLD

In New Digital Format!

Subscribe Now.

PC WORLD
THE TROUBLE-FREE PC

Why get PC WORLD in digital format?

1> Same great magazine.
Read the magazines you know in a convenient new format.

2> Immediate access.
Get your issues before they hit the newsstand, then read them anytime - even offline.

3> Keyword searchable.
Find a topic or name in seconds.

4> Live Links.
Quick hot links for easy navigation to Web content, advertisers' sites and other articles throughout the issue.

5> Paperless archives.
Keep back issues on your computer for fast reference and easy storage.

6> Great Savings.
Canadian and International subscribers will save even more as postage costs are eliminated!

SPECIAL CHARTER PRICE

12 issues for $19.97

No Additional Postage in Canada and Foreign Countries

CALL 1-800-825-7595

Use Order Code H3DMPCD

In Canada, price includes 7% GST (#R124669680).

Order Online and get Bonus Issue Instantly!

You'll get 13 issues for $19.97.
http://www.pcworld.com/digital

PC WORLD

PHONE:
415/243-0500

FAX:
415/442-1891

E-MAIL:
letters@pcworld.com

WORLD WIDE WEB:
www.pcworld.com

AOL KEYWORD:
pcworld

MAIL:
PC World Editorial
501 Second St. #600
San Francisco, CA
94107

EDITORIAL DIRECTOR Kevin McKean
EDITOR Harry McCracken **CREATIVE DIRECTOR** Robert Kanes

EDITORIAL

EDITOR, PCWORLD.COM & EXECUTIVE EDITOR, NEWS Ramon G. McLeod

MANAGING EDITOR Kimberly Brinson

EXECUTIVE PRODUCER Andrew Eisner

EXECUTIVE EDITORS Edward N. Albro, Tracey Capen, Randy Ross

ASSISTANT MANAGING EDITOR
Paul-Michael King

SENIOR EDITORS Yardena Arar, Rex Farrance, Rebecca Freed, Karl Koessel, Michael S. Lasky, Aoife M. McEvoy, Alan Stafford, Peggy Watt, Anush Yegyazarian

SENIOR ASSOCIATE EDITORS
Grace Aquino, Richard Baguley, Andrew Brandt, Seán Captain, Tom Mainelli, Anne B. McDonald, Dennis O'Reilly

SENIOR REPORTER Tom Spring

ASSOCIATE EDITORS Lisa Cekan, Eric Dahl, Alexandra Krasne, Kalpana Narayanamurthi, Melissa J. Perenson

SENIOR PRODUCER, DOWNLOADS
Max Green

SENIOR COPY EDITORS
Stephen Compton, Steven Gray, Frederic Fane Wolfer, Tracy Yee

ONLINE INDEXER David Lake

RESEARCH EDITOR Kristina Saar

EDITORIAL PRODUCTION ASSOCIATE
Henry Pham

ASSISTANT TO THE EDITORIAL DIRECTOR
Laura Blackwell

EDITORIAL ASSISTANT
Felicia Williams

BUSINESS MANAGER Thomas Peña

ART AND DESIGN

DEPUTY ART DIRECTOR Barbara Adamson

ASSOCIATE ART DIRECTORS Kate Godfrey, Pierre Granier

ASSISTANT ART DIRECTOR Beth Kamoroff

SENIOR DESIGNER Sean McDonald

ASSOCIATE DESIGNERS Diego Aguirre, Marlene Tobias

CONTRIBUTING EDITORS

Steve Bass, George Campbell, Scott Dunn, Steve Fox, Judy Heim, Stuart J. Johnston, Anne Kandra, Dan Littman, Stephen Manes, James A. Martin, Stan Miastkowski, Scott Spanbauer, Lincoln Spector, Kirk Steers, Carla Thornton, Daniel Tynan, Kim Zetter

PC WORLD TEST CENTER

TEST CENTER DIRECTOR
Ulrike Diehlmann

MANAGER OF BENCHMARK DEVELOPMENT
James Motch

SENIOR PERFORMANCE ANALYSTS
Elliott S. Kirschling, Jeffrey Kuta

DEVELOPMENT ANALYST
Thomas Luong

PERFORMANCE ANALYST
Tony K. Leung

SENIOR TEST CENTER COORDINATOR
Julian Weatherby

TEST CENTER COORDINATOR
Julio C. Giannobile

NEW PRODUCT ANNOUNCEMENTS

Send press releases via e-mail to newproducts@pcworld.com.

PCW COMMUNICATIONS

PRESIDENT AND CHIEF EXECUTIVE OFFICER
Jeff Edman

PUBLISHER Bob Ostrow

SENIOR VP, COO/CFO Vicki Peilen

SENIOR VP, HUMAN RESOURCES
Richard Willoughby

VP, CONSUMER MARKETING
Shawne Burke Pecar

FOUNDER David Bunnell

FOUNDING EDITOR Andrew Fluegelman

SUBSCRIPTION SERVICES

MAIL: PC World Subscriber Services, P.O. Box 37571, Boone, IA 50037-0571. (Include a mailing label with correspondence.)

INTERNET: www.pcworld.com/customer

E-MAIL: pcwcustserv@cdsfulfillment.com (Send your full name and the address at which you subscribe; do not send attachments.)

PHONE:	In the U.S.	800/234-3498
	New orders	800/825-7595
FAX:	515/432-6994	

QUESTIONS AND SUBMISSIONS

Send material electronically to the appropriate online address listed below, or mail it to *PC World*. We reserve the right to edit letters. *PC World* pays $50 for published *Here's How* tips and questions; accepted submissions will be acknowledged by payment. Editors cannot guarantee personal responses to all questions.

ANSWER LINE: answer@pcworld.com
BUGS AND FIXES: bugs@pcworld.com
CONSUMER WATCH:
consumerwatch@pcworld.com
FULL DISCLOSURE: steve@cranky.com
HARDWARE TIPS: kirk_steers@pcworld.com
HOME OFFICE: homeoffice@pcworld.com
INTERNET TIPS: nettips@spanbauer.com
LETTERS: letters@pcworld.com
ON YOUR SIDE: onyourside@pcworld.com
PRIVACY WATCH:
privacywatch@pcworld.com
STEP-BY-STEP:
stan_miastkowski@pcworld.com
WEB SAVVY: websavvy@pcworld.com
WINDOWS TIPS: scott_dunn@pcworld.com

REPRINTS AND PERMISSIONS

You must have permission before reproducing any material from *PC World*. Write to *PC World*, Reprints and Permissions, 501 Second St. #600, San Francisco, CA 94107; include a phone number. To order reprints of your company's editorial coverage in *PC World*, call 717/399-1900 ext. 135.

BACK ISSUES

PC World issues are available in digital format starting with the July 2002 issue. Go to http://www.pcworld.com/singlecopy. *PC World* issues and article copies are available on microfilm and microfiche from UMI, 300 N. Zeeb Rd., Ann Arbor, MI 48106-1346; 800/521-0600.

MAILING LISTS

Occasionally we make our subscribers' names available to other companies whose products may interest you. To have your name excluded from these mailings, send a request with your mailing label to Subscriber Services, P.O. Box 37571, Boone, IA 50037-0571 or e-mail us at pcwcustserv@cdsfulfillment.com.

PUT the instructions in the trash

if you think it's too easy to install your Microsoft Wireless Broadband Network.

Easy networking starts here.

WIRELESS)))

Microsoft

Introducing Wireless Broadband Networking from Microsoft® Now you can link all of your home PCs to one broadband connection, all at once. Just plug it in—the smart software automatically detects your Internet settings and does the rest. Yeah, it's that easy. Come to think of it, almost too easy. To see our full line of networking products visit **microsoft.com/broadbandnetworking**

BEST BUY Turn On the Fun

STAPLES

COMPUSA THE COMPUTER SUPERSTORE

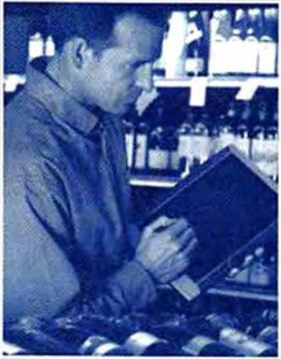
circuit city

amazon.com and you're done.

© 2002 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark of Microsoft Corporation in the U.S. and/or other countries. The names and logos of actual companies and products mentioned herein may be trademarks of their respective owners.

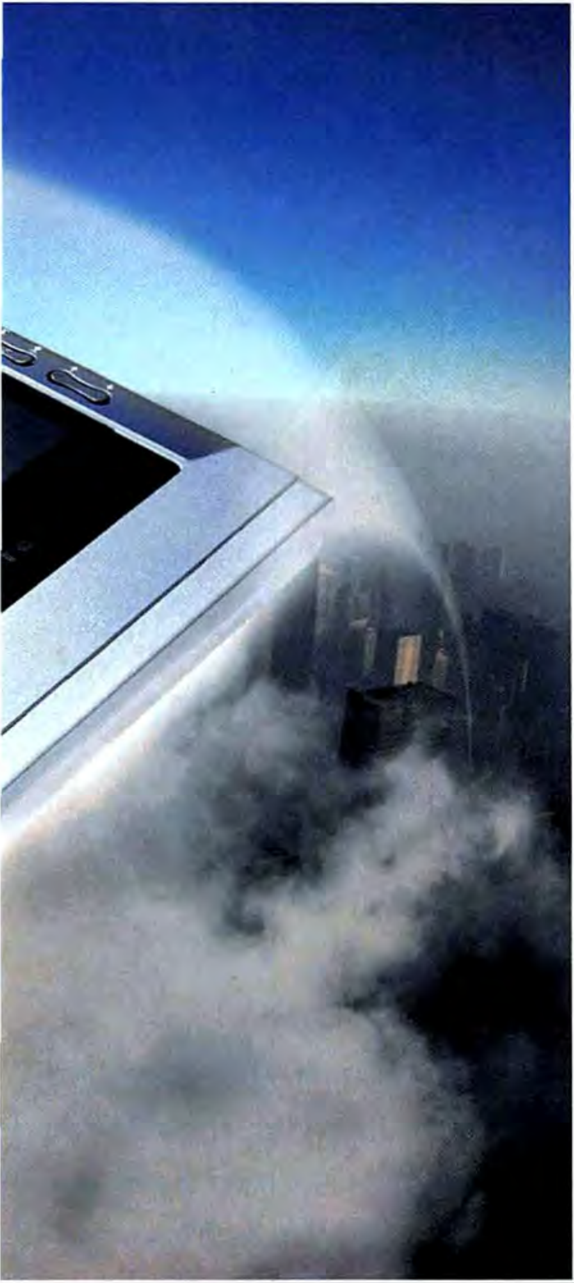
The Stylistic® ST4000 Tablet PC Is Here.

Don't expect our Tablet PC to be like all the rest. It's not some OEM clone. Or a PDA on steroids. Or a stripped down notebook. Instead, it's powered by the latest Intel® processor. Runs any Windows application. Thrives with or without a keyboard and slips effortlessly into our optional Tablet Dock for instant desktop duty. It's thin, it's light, it's flat. In other words, it's everything 12 years of industry-defining experience said it could be: The most natural, mobile, productive and thoroughly thought out PC the world has ever seen.



The Stylistic® ST4000 is powered by an Ultra Low Voltage Mobile Intel® Pentium® III Processor 800MHz – M which supports Enhanced Intel® SpeedStep® Technology.

Fujitsu and the Fujitsu logo are registered trademarks of Fujitsu Limited. Stylistic is a registered trademark of Fujitsu PC Corporation. Intel, the Intel Inside logo, Pentium and Intel SpeedStep are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation. © 2002 Fujitsu PC Corporation. All rights reserved.



12 YEARS.

12 YEARS OF DESIGNING, TESTING AND IMPLEMENTING PEN COMPUTING PRODUCTS.

OUR TABLET PC IS HERE.

12 YEARS AWAY FROM ORDINARY.

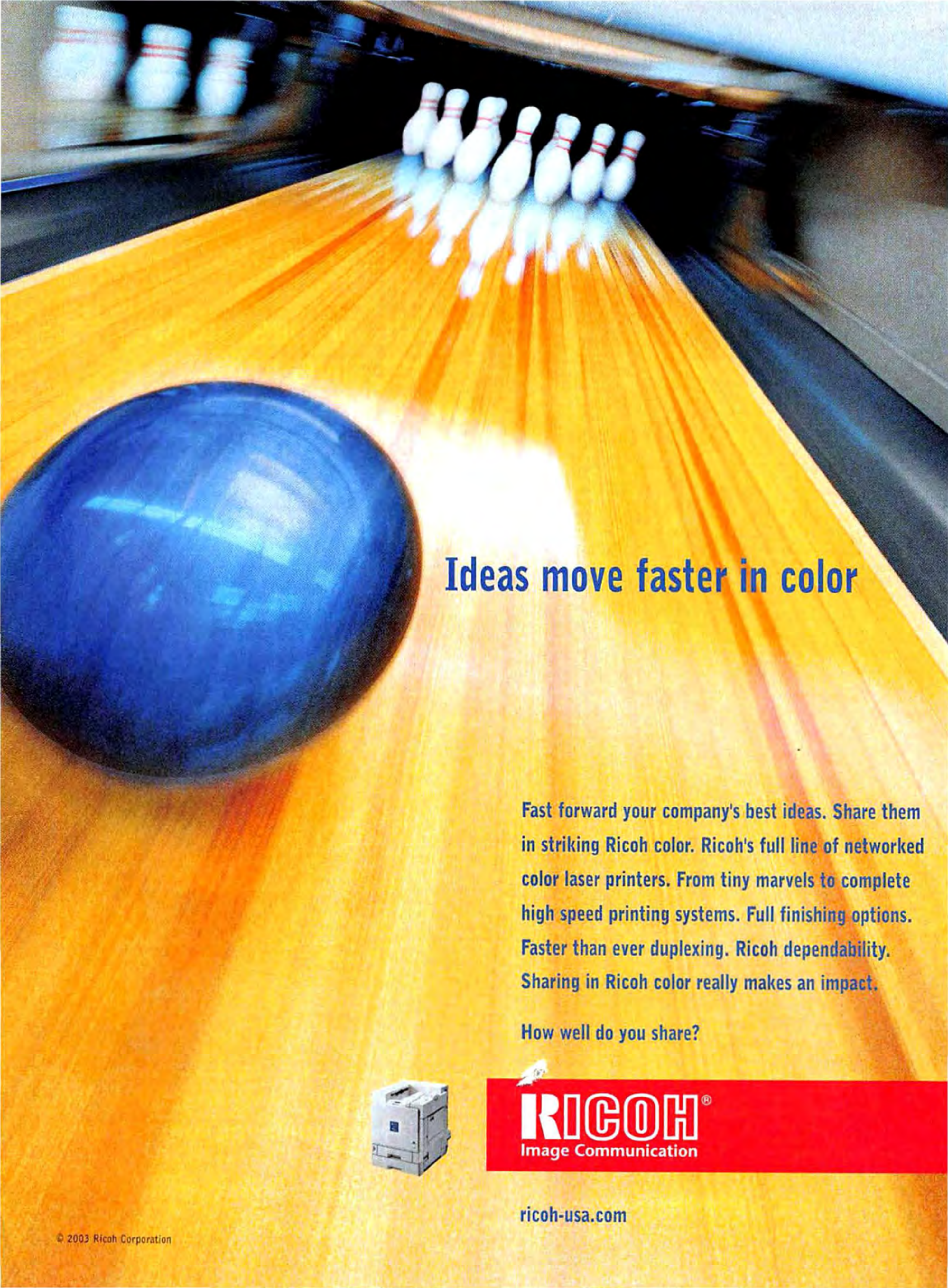
FUJITSU

THE POSSIBILITIES ARE INFINITE

Learn how our Tablet PCs can give your company a competitive edge.

Call us today at **1-877-372-3473** or visit **www.fujitsupc.com/12years**

Fujitsu recommends Microsoft® Windows® XP Professional for Mobile Computing.



Fast forward your company's best ideas. Share them in striking Ricoh color. Ricoh's full line of networked color laser printers. From tiny marvels to complete high speed printing systems. Full finishing options. Faster than ever duplexing. Ricoh dependability. Sharing in Ricoh color really makes an impact.

How well do you share?

RICOH®
Image Communication

ricoh-usa.com

© 2003 Ricoh Corporation

Hot Technology vs. Proven Technology

Here's how to tell when it's time to ring out the old and ring in the new.

MEET THE TECH INDUSTRY'S WORST nightmare: A unique, custom-integrated combination of hardware and software that's undeniably useful. Enticingly economical. And so refreshingly easy to use that you'd swear it has no learning curve at all. No, it's not the brainchild of a spunky start-up out to take on Intel and Microsoft. It's the PC, software, and peripherals already on your desk.

We've always expected new stuff to offer real advantages over what we own. But as we head into 2003, the game has changed. Old items—from business software to entertainment gear—don't fade into obsolescence as quickly as they did even three years ago. And the payback from new equipment must be even more compelling.

All of which leaves companies competing with...well, the still-useful products they sold us a few years ago. There's evidence throughout this issue, from the cover story, "What's Hot for 2003" (page 92), to our tests of Intel's 3-GHz Pentium 4 (page 26), to a test drive of the next version of Microsoft Office (page 40).

So how can you tell when it makes sense to dump the old and reliable for the new and untested? A few tips:

Find the right moment to buy. Oftentimes, it's not the instant a cutting-edge product arrives—it's after vendors have fixed the worst kinks and slashed prices. So if you can hold off, do. But don't go into permanent waiting mode: The best time to buy a new PC is the precise moment your old workhorse starts to feel more like a dog.

Choose features over specs. The tech specs for even a garden-variety new PC—like CPU speed and drive capacity—dwarf those of yesterday's powerhouses. And that's okay. Most of us don't need that much muscle just yet. More intriguing—at least to me—are new products that do things that older equipment just can't accomplish. "What's Hot for 2003" features a bunch: DVD burners for the road, TV-savvy Media Center PCs, and more.

Eyeball those requirements. Did I say that CPU and disk specs weren't worth fretting over? I lied. For heavy-duty work like video editing, they're key. I was startled to learn that the recommended minimum for Adaptec's new MyDVD video suite is a 1.2-GHz Pentium 4, 256MB of RAM, and 15GB of free drive space—specs that rule out any PC sold before early 2001.

Remember the domino effect. One new product often begets the need for several more. If you decide you've gotta have Microsoft Office 11 (due in mid-2003), then you've gotta run Windows XP or 2000 SP3. But if your system is too geriatric, this might also mean you've gotta install sweeping upgrades or buy a new PC.

Investigate upgrades. These days, much of what's genuinely hot lies outside the box. I recently spruced up my home office with a new LCD monitor and a wireless network—two relatively economical upgrades that made me a lot happier than 3 GHz of raw processor power ever could.

When you do buy, think ahead. Tech gear, like kids' clothes, should be bought a size or two bigger than necessary. Though you may not need all that power now, you'll grow into it—maybe sooner, maybe later, but it will happen.

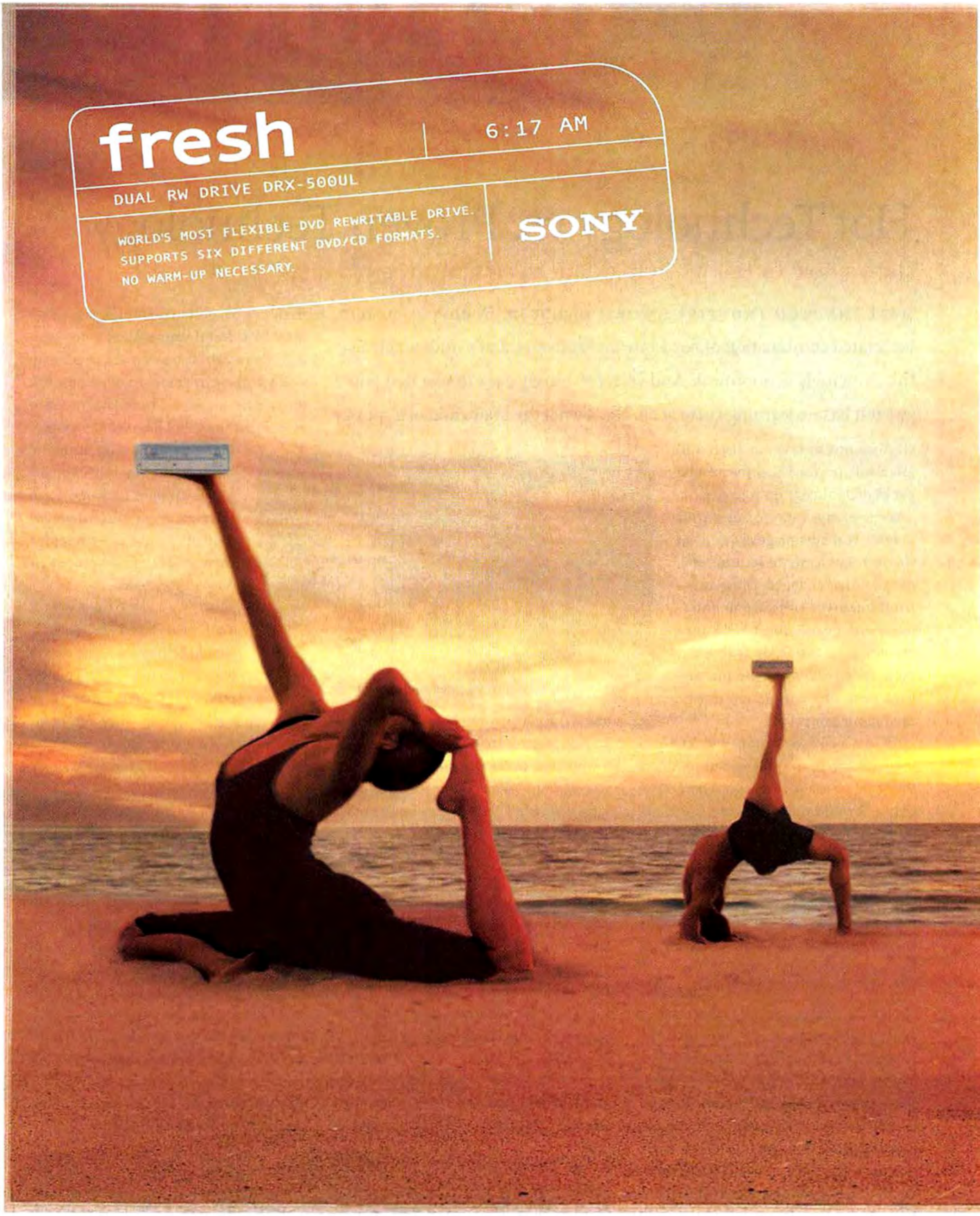
A DOWNLOADABLE PC WORLD

SPEAKING OF THE new and noteworthy: We've teamed with Zinio to create a digital version of the magazine that you can download and read on a PC. It's a faithful replica of our dead-tree edition—from *Top 100* charts to ads—with electronic niceties like keyword searching and live Web links. If you like both digital interactivity and print look and feel, this could be the *PC World* for you. To buy one issue, visit www.pcworld.com/singlecopy; to subscribe, see www.pcworld.com/digital. ■

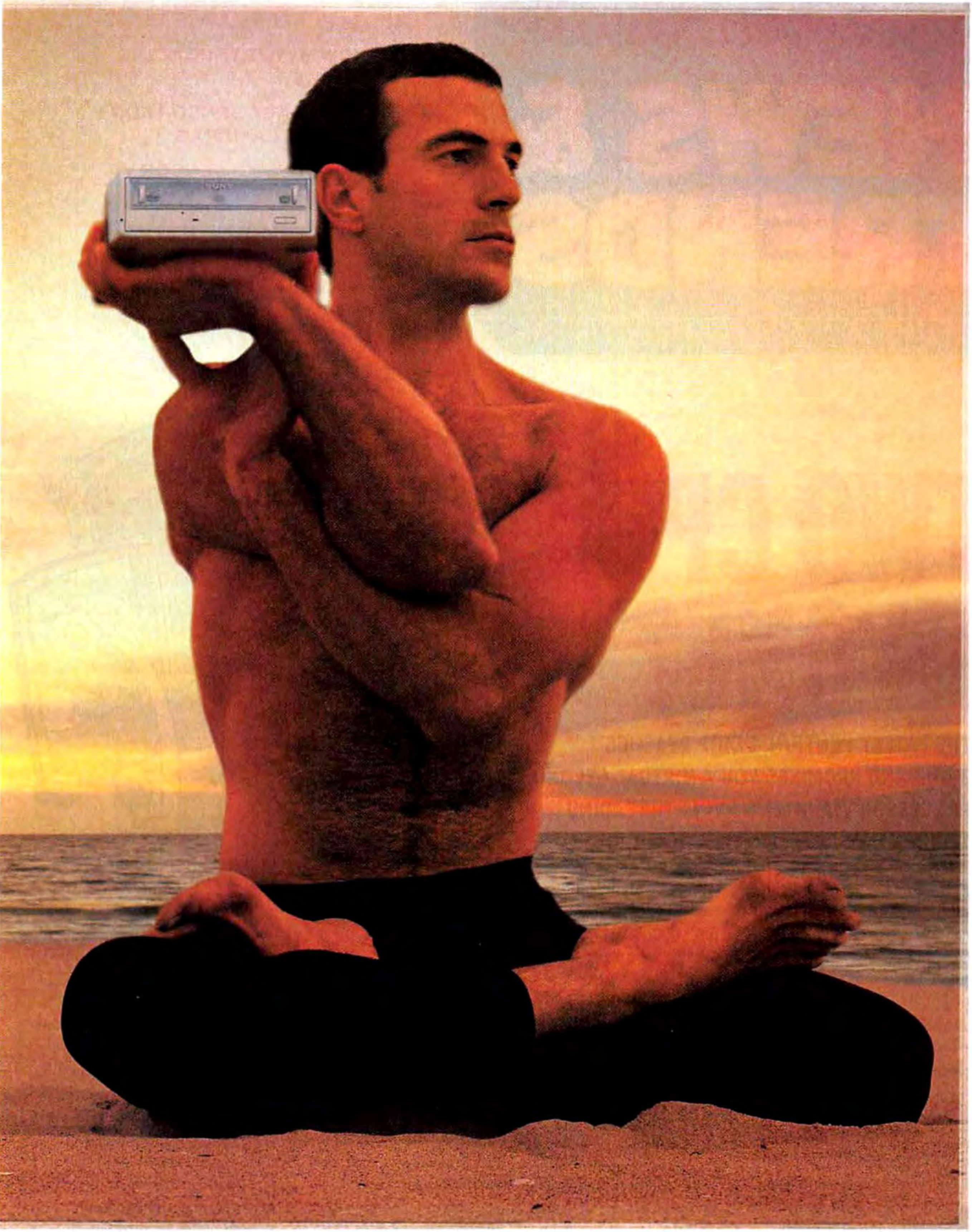
Harry McCracken (harry_mccracken@pcworld.com) is editor of PC World.

Tell Us What You Think: Visit www.pcworld.com/pcwinput and rate this issue—you could win $500. You'll need your subscriber number from the mailing label to take this survey online. The Web site explains the official rules and also how to participate in the drawing if you're not a subscriber. You can enter from December 3, 2002, through January 3, 2003.

ILLUSTRATION: PJ LOUGHRAN


fresh
6:17 AM
DUAL RW DRIVE DRX-500UL
WORLD'S MOST FLEXIBLE DVD REWRITABLE DRIVE.
SUPPORTS SIX DIFFERENT DVD/CD FORMATS.
NO WARM-UP NECESSARY.
SONY

Introducing the world's first DVD rewritable drive that's flexible enough to record on **DVD-R, DVD-RW, DVD+R, DVD+RW, CD-R,** and **CD-RW** discs. So while everyone else worries about formats, you can edit home movies, create interactive slide



shows and burn your original music. You can even preserve your tape collection for playback in most DVD players. And with 4.7 gigabytes* of data storage, the Dual RW drive has plenty of room for all your fresh ideas. **www.sony.com**

©2002 Sony Electronics Inc. Reproduction in whole or in part without written permission is prohibited. All rights reserved. *Gigabyte means 1,000 megabytes. External Dual RW drive model DRX-500UL shown. Internal PC model DRU-500A also available. Please record responsibly. Before copying anything onto a CD or DVD disc, be sure you are not violating copyright law. Not recommended for use on sand or in water.

What's new and what's next in technology

NEWS & TRENDS

EDITED BY RAMON G. McLEOD

INSIDE

28 P4 PERFORMANCE TESTS

30 HOW HYPERTHREADING WORKS

34 NEW IMAGE SENSOR FOR DIGITAL CAMERAS

36 FOVEON'S X3 SENSOR VS. STANDARD SENSORS

40 PREVIEW OF MICROSOFT'S NEW OFFICE

42 WIRELESS PROJECTORS

TWO CPUs IN ONE?

THE LATEST PENTIUM 4 CHIP REACHES 3 GHZ AND PROMISES YOU A VIRTUAL SECOND PROCESSOR VIA INTEL'S HYPERTHREADING TECHNOLOGY. BY TOM MAINELLI

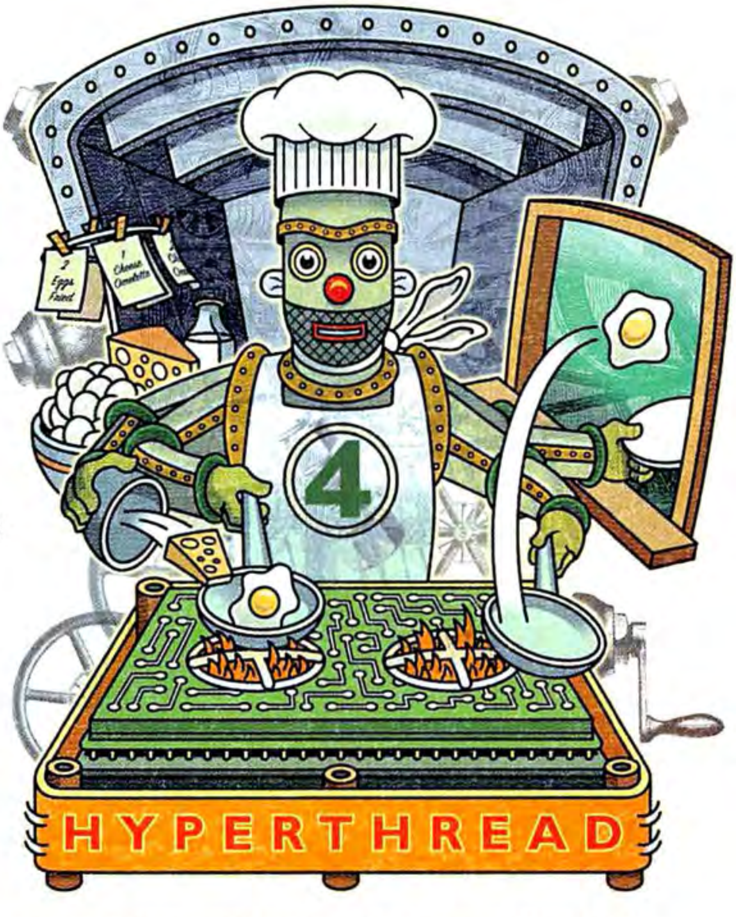


ILLUSTRATION: PETE AND MARIA HOEY

TEST Center THE LATEST Pentium 4 processor not only passes another megahertz milestone by running at 3.06 GHz, it also introduces Intel's new hyperthreading technology to the desktop.

Hyperthreading enables one processor to act like two. As a result, it can simultaneously tackle multiple applications (or a single application that has multiple threads), put idle CPU cycles to use, and boost system performance by up to 25 percent—all without requiring specially written applications, according to Intel.

Sounds good, doesn't it? Exclusive *PC World* tests on three of the first systems to use the new processor, however, show that hyperthreading's benefits largely are application- or even task-specific. For example, on the office applications that most people use—such as Microsoft's Word and Excel—hyperthreading had a neutral or slightly negative impact. And on tests specifically designed to expose the benefits of hyperthreading, many improvements were too slight to be detectable by the average user, except with select filters in Adobe Photoshop, with various video and photo programs such as Adobe Premiere and Roxio VideoWave, and on certain multitasking tests.

Furthermore, a comparison system equipped with AMD's Athlon XP 2800+, which runs at 2.25 GHz, more than held its own against these 3-GHz powerhouses that were running 800 MHz faster. Nevertheless, hyperthreading remains a very new technology, and Intel anticipates further performance improvements as applications are modified to take better advantage of it.

We tested three shipping

NOTES FROM THE LAB

- **For optimum single-application performance, you must do more than disable hyperthreading in your new system's BIOS: You have to turn the PC off and then reinstall Windows XP from scratch. That's because the multithreaded version of Windows XP loads more files and uses more resources than the standard version, and so imposes a performance penalty from the get-go—when you switch off hyperthreading, those files are still loaded.**

- **Adobe Photoshop can show dramatic speed improvements with hyperthreading, but you have to use the right filters, such as Crystallize or Radial Blur—those that tend to do calculations throughout the process instead of just simple conversions. Multiple calculations keep the CPU busy and take advantage of hyperthreading efficiencies. You can get bottlenecks if you have an application—or multiple single-threaded applications—that try to use the same resources on the chip.**

3.06-GHz P4 systems, each packing 1GB of 1.066-GHz RDRAM and running Windows XP Professional. (Currently, hyperthreading works only with either Windows XP Professional or Home, or with such major distributions of Linux as SuSE or Red Hat; these OSs can recognize the technology and use it as they would two physical processors.) Our P4 PCs included the Dell Dimension 8250 ($3419), the Falcon Northwest Mach V ($3288), and the Gateway 700XL ($3899), each loaded with high-end components and ready for the most demanding computing tasks.

Our two shipping comparison machines were Falcon's Athlon XP 2800+ Mach V, carrying 1GB of 333-MHz DDR SDRAM ($2786), and Xi Computer's MTower DPR, with two 2.8-GHz Xeon CPUs and 512MB of 800-MHz RDRAM ($3924). Like the P4 systems, the two comparison PCs ran Windows XP Pro; we tested all Intel-based PCs with hyperthreading both on and off.

IFFY ON OFFICE APPS

ON OUR PC WorldBench 4 test suite, hyperthreading produced little positive effect—as we expected given that the multiprocessor-aware OS imposes a performance penalty because it requires additional resources to run (see "Notes From the Lab," above), and PC WorldBench 4 uses many standard office apps that can't take real advantage of hyperthreading when run singly. The Athlon XP system scored 130, besting all three P4 PCs as well as the dual-Xeon unit. In fact, the score for each P4 system was the same or slightly worse with hyperthreading turned on. The Falcon suffered the biggest drop, from 127 with the feature disabled to 121 with it enabled.

Also, with hyperthreading two of the three 3.06-GHz systems scored 7 to 8 percent lower than the average of five previously tested P4 systems running at 2.53 GHz (121) and of six at 2.8 GHz (123).

HITS AND MISSES

TO BETTER EXAMINE hyperthreading technology, the PC World Test Center devised several tests. Our analysts created two using Photoshop, engineered two multitasking tests, and added snippets from the still-in-progress PC WorldBench 5 (due later in 2003).

Our first Photoshop test employed 20 commonly used filters—most of them specified by Adobe and by *PC World*'s art department, with a few chosen from Intel's recommendations. Since Photoshop is a multithreaded application, we expected some improvement with Intel's new technology, but the Athlon XP PC beat the P4 and Xeon systems regardless of hyperthreading status. The Dell PC received a 2-point boost from hyperthreading—the largest among the P4s here, but scarcely noticeable by most users.

In a second round of Photoshop tests, we used 20 filters selected by Intel to showcase its technology. Using these filters, which often incorporate intermediate calculations that hyperthreading can run in parallel, the P4 machines did show marked improvement. For example, the Dimension 8250 completed the test in 118 seconds with hyperthreading turned off (slower than the Athlon XP system's 104 seconds), but reduced its time to 96 seconds with the feature turned on—certainly a significant improvement. ▶

IN BRIEF

Product Pipeline

MORE MEDIA PCs: Following in HP's footsteps, ABS, Alienware, Cyberpower, and Gateway now offer PCs with Microsoft's remote-control-ready Windows XP Media Center Edition. ABS's PC starts at $1699 sans monitor (find.pcworld.com/32183); Alienware's box-shaped Navigator Pro starts at $1999 (find.pcworld.com/32132); Cyberpower's entry-level model starts at $1499 (find.pcworld.com/32180); and Gateway's high-end $4000 model includes a 42-inch plasma-screen television (find.pcworld.com/32135).

PERSONAL TOUCH: HP's iPaq Pocket PC H5450 is the first PDA to offer biometric security with a built-in fingerprint scanner. The $699 device also features Wi-Fi and Bluetooth adapters along with a sleek new design. find.pcworld.com/32144

Did You Know?

95 PERCENT THE NUMBER of U.S. households with three cell phones increased by 95 percent in the year ending last spring, to 10 percent. Today, 25 percent of homes have two cell phones, and 32 percent have one.

[illegible]

TEST REPORT

HYPERTHREADED P4 PCs' PERFORMANCE A MIXED BAG...

SYSTEM	CPU	Memory	Hyperthreading	PC WorldBench 4 score	PHOTOSHOP 7.0.1		VIDEOWAVE 1.5		Premiere 6 (seconds)	Castle Wolfenstein 1024 by 768 (fps) [1]	Unreal Tournament 1024 by 768 (fps) [1]
					PCW (seconds)	Intel (seconds)	DivX (seconds)	MPEG-1 (seconds)			
Dell Dimension 8250	3.06-GHz Pentium 4, 512KB L2 cache	1GB PC1066 RDRAM	Disabled	117	108	118	73	250	251	110	206
			Enabled	113	106	96	74	223	239	113	200
Falcon Northwest Mach V	3.06-GHz Pentium 4, 512KB L2 cache	1GB PC1066 RDRAM	Disabled	127	102	113	**72**	252	278	117	227
			Enabled	121	102	**92**	**72**	225	274	118	227
Gateway 700XL	3.06-GHz Pentium 4, 512KB L2 cache	1GB PC1066 RDRAM	Disabled	118	110	120	82	251	249	**123**	208
			Enabled	117	109	100	83	226	**231**	**123**	210
Falcon Northwest Mach V	2.25-GHz Athlon XP 2800+, 256KB L2 cache	1GB DDR333 SDRAM	n/a	**130**	**95**	104	81	269	**231**	102	**229**
Xi MTower DPR	Dual 2.8-GHz Xeon, 512KB L2 cache each	512MB PC800 RDRAM	Disabled	111	104	84	77	**207**	303	96	200
			Enabled	111	102	72	75	215	299	96	200
Average of six systems [2]	2.8-GHz Pentium 4, 512KB L2 cache	512MB RDRAM	n/a	123	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Average of five systems [2]	2.53-GHz Pentium 4, 512KB L2 cache	1GB RDRAM or SDRAM	n/a	121	n/a	n/a	n/a	n/a	n/a	n/a	n/a

TEST Center **HOW WE TEST:** All PCs tested with PC WorldBench 4, PC World's application-based benchmark; see www.pcworld.com/benchmark. In the Photoshop 7.0.1 tests, we timed first the running of 20 commonly used filters on an image (PCW) and then 20 Intel-designated filters on the same image (Intel). In Roxio VideoWave 1.5 tests, we timed first the conversion of a raw video file into a DivX file with sound, then the conversion of a raw video file into another video file, and then to an MPEG-1 (both with sound). In the Adobe Premiere 6 test, we timed the conversion of a raw video file into two finished files. In the Return to Castle Wolfenstein and Unreal Tournament 2003 tests, we measured the frame rates during a recorded demo and a flythrough of one game level, respectively. A lower score is better in the Photoshop, Premiere, and VideoWave tests; in others, higher is better. Tests developed and conducted by the PC World Test Center. All rights reserved. n/a=Not applicable. [1] Frames per second. [2] These systems ran Windows XP Home instead of Windows XP Pro.

Hand-timed multitasking tests proved a mixed bag for the P4 systems. In one test the photo-management application ACDSee converted 315 TIFF files into JPEGs in the foreground, as McAfee VirusScan checked a directory of folders in the background. Though the P4-based systems all outperformed the Athlon XP PC here, hyperthreading's benefits were far from uniform. For example, the Dell experienced a 4 percent slowdown on ACDSee, but a 4 percent boost on McAfee, whereas the Gateway netted an 8 percent boost on McAfee and no slowdown on ACDSee. In every case, however, running the applications consecutively took less time than running them concurrently.

The opposite was true on a different multitasking test. Here, we used Ahead's Nero Burning ROM to re-create a 490MB hard drive image in the background and used Musicmatch to convert ten WAV files into MP3s in the foreground. Unlike in the previous tests, running the two applications simultaneously was faster than running them separately—by about 30 seconds for the P4s and by 53 seconds for the dual-Xeon PC. Again, the P4-based systems performed best overall, and many performed slightly better with hyperthreading in the concurrent runs.

In testing VideoWave, we used both DivX-based files and MPEG-1 files. Scores fell slightly or remained the ▶

TEST REPORT

...BUT P4 PCs HAVE A MULTITASKING ADVANTAGE

SYSTEM	CPU	Hyperthreading	MULTITASKING 1 (SECONDS)				MULTITASKING 2 (SECONDS)			
			Musicmatch 7.2 solo	Nero Burning ROM 5.5 solo	Musicmatch in the foreground	Nero in the background	ACDSee solo	McAfee VirusScan 7 solo	ACDSee in the foreground	McAfee in the background
Dell Dimension 8250	3.06-GHz Pentium 4	Disabled	139	48	158	63	94	130	210	268
		Enabled	139	47	**155**	65	95	130	219	256
Falcon Northwest Mach V	3.06-GHz Pentium 4	Disabled	**137**	60	158	77	86	135	222	272
		Enabled	138	53	160	66	87	137	226	268
Gateway 700XL	3.06-GHz Pentium 4	Disabled	140	47	159	57	**82**	147	**199**	276
		Enabled	140	**45**	156	**52**	86	150	**199**	**255**
Falcon Northwest Mach V	2.25-GHz Athlon XP 2800+	n/a	158	51	176	76	**82**	**125**	234	286
Xi MTower DPR	Dual 2.8-GHz Xeon	Disabled	149	70	166	79	88	137	216	**255**
		Enabled	149	70	166	75	86	140	227	269

TEST Center **HOW WE TEST:** In the Musicmatch Jukebox 7.2 solo test, we timed the conversion of ten WAV files into MP3s; in the Nero Burning Rom 5.5 solo test, we timed the creation of a 490MB hard drive image. On Multitasking Test 1, we timed the Musicmatch test running in the foreground and the Nero test running simultaneously in the background. In the ACDSee 5 solo test, we timed the conversion of 315 TIFF files into JPEG files; in the McAfee VirusScan 7.0 Home Edition test, we timed the scan of a directory for viruses. On Multitasking Test 2, we timed the ACDSee test running in the foreground and McAfee running simultaneously in the background. In all cases, lower is better. Tests developed and conducted by the PC World Test Center. All rights reserved.

avant-garde technology + distinctive support = $(\text{masterpiece})^2$

Image is everything. When form and function are of equal importance, displays and projectors from BenQ offer a beautiful solution. Their highly evolved, graceful designs provide an elegant complement to any digital environment. But don't let their good looks deceive you. BenQ displays and projectors feature sophisticated, visionary technology that ensures superior color accuracy, dazzling graphics, and intuitive ease of operation. The result is products that are both a pleasure to look at *and* use.

Making service and support an art form. BenQ is a company of experts dedicated to creating an experience for its customers unlike any other in the industry. We've raised the bar for service and support to a level of excellence you'll notice instantly. It's a commitment pervasive throughout our organization, where all efforts are focused on your total satisfaction. ***Because at BenQ, enjoyment matters.***

COMPUTERS 4sure.com AN Office DEPOT COMPANY	Insight	MICRO WAREHOUSE	PCMall	TigerDirect.com	ZONES
800-266-7883	800-467-4448	800-367-6808	800-555-6255	888-335-4062	800-408-9663

For more information, visit www.BenQ.com/2002/PCWorld
Email us at ProdInfo.us@BenQ.com or call (866) 700-2367

BenQ
Enjoyment Matters

©2002 BenQ Incorporated. All rights reserved. All trademarks and registered trademarks are the property of their respective holders.

same with hyperthreading enabled on the DivX files, but they improved by over 10 percent on the MPEG-1 files.

Bottom line: Hyperthreading's effects vary widely, and depend on what application—or set of applications—you run. In most cases, however, it seemed to have only a slight effect. And the only way to gauge how your favorite applications will react is to try them out. (For all test results, see the charts on page 28.)

TECHNOLOGY A BUST?

WHY WOULD a speedier chip that is capable of acting like two processors have so little positive impact on test scores?

"One ill-behaved application could cause problems in a hyperthreading PC," suggests Kevin Krewell, general manager at research firm MicroDesign Resources. That's because while the new P4 tricks the operating system into believing it is two chips, it still has the resources of just one.

For example, the new P4 shares its on-board cache as needed, but it splits its write buffer resources in half—so a single-threaded application that once had access to all eight write buffers can now only use four, he explains.

Brian Fravel, Intel's marketing manager for desktops, claims that with hyperthreading enabled, "The vast majority of applications will be neutral to positive in a stand-alone environment, and almost all applications will see a benefit when multitasking."

The key to taking advantage of hyperthreading is not merely to run multiple programs or a multithreaded application; it is to make sure that those programs hammer the processor with tasks, says Dean McCarron, a principal analyst at Mercury Research. "Both threads need to be throwing instructions at the processor simultaneously," he says.

Though software doesn't need to be optimized in order to use hyperthreading, vendors can tweak their programs to utilize the technology better, says Intel's Fravel. The company won't disclose specifics, but according to Fravel the developers of image- and video-editing applications will probably be among the first to optimize their current offerings. "When you look at video encoding and transcoding today, it's so processor intensive. There are so many places where, if you write it to use hyperthreading, you can take advantage of those unused processor cycles," Fravel says.

Video game programmers could also make multithreaded hay, simultaneously increasing the sophistication of artificial intelligence engines and developing a more realistic 3D environment, he adds.

Intel clearly hopes hyperthreading will make PC sales jump ahead of where they are today, says MDR's Krewell.

"If you look at the timing, Intel is clearly trying to goose the market," he says. "Intel will have the latest and greatest chip with the newest buzzword, and that could be a substantial marketing tool."

COMPETITION AHEAD

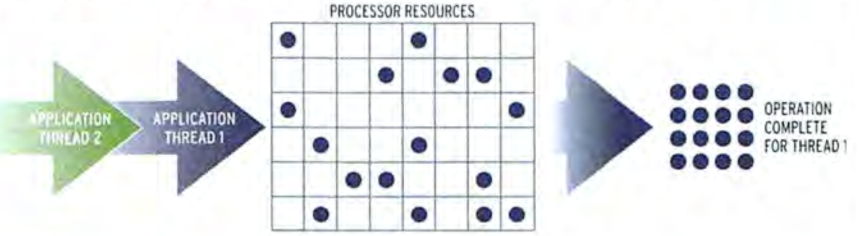
DON'T EXPECT the competition to sit still as Intel trumpets its new technology. AMD will launch an improved version of its current Athlon XP chip, code-named Barton, and its 64-bit Hammer-based processors, sometime in the first half of 2003. According to Krewell, the highly efficient Hammer, which comes with on-board memory controllers, should help AMD compete vigorously against Intel's hyperthreaded Pentium 4.

In the meantime, though, for straight-ahead performance and price, you're likely better off choosing one of Intel's older P4 machines or a high-end Athlon XP-based system. If you are serious about multithreaded applications or you use video or photo editing programs heavily or you multitask as a matter of course, the new P4 systems may suit you. Just remember to choose your applications carefully. ▶

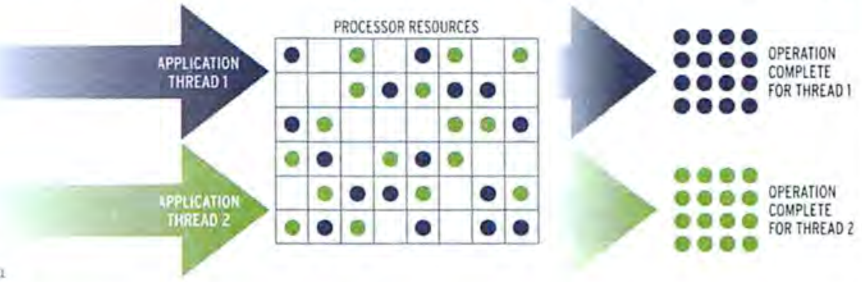
HOW HYPERTHREADING WORKS

THE AIM OF INTEL'S new hyperthreading technology is to use a CPU's resources more efficiently to get the job done. As Brian Fravel, Intel's desktop marketing manager, puts it, "Today's processors are one cook with one pan; the new chip is still one cook, but with two pans." A cook who works on two dishes at the same time should be able to complete work on both in less time overall.

WITHOUT HYPERTHREADING: When a multithreaded application or multiple applications send requests to the CPU, they line up and get taken care of sequentially, so one app stays idle until the other's task is complete, leaving some of the CPU's resources unused.



WITH HYPERTHREADING: The processor and operating system can see multiple requests from apps and feed them to the CPU so that it handles both simultaneously. This should yield a more-efficient use of resources and permit quicker completion of both applications' tasks.


PROCESSOR RESOURCES
APPLICATION THREAD 1
APPLICATION THREAD 2
OPERATION COMPLETE FOR THREAD 1
OPERATION COMPLETE FOR THREAD 2

SOURCE: INTEL

©2002 Circuit City® Stores, Inc. See store for details.

OUR LOW PRICE GUARANTEE MEANS
NO WORRIES.

OF COURSE, IF YOU LIKE
WORRYING, SORRY ABOUT THAT.

With Circuit City's Price Match Plus, if you find a lower price within 30 days of purchase, we'll give you back 110% of the price difference.

We're with you.™

circuitcity.com

circuit city
Video

Looking for the best digital photos?
Follow the leader.

EPSON
EPSON STYLUS PHOTO 925

YOU'VE GOT TO SEE IT IN EPSON COLOR.™

Print your photos from memory cards* or any Direct-Connect-Compatible (DCC™) digital camera. Then save them directly to an external USB Zip drive – all without a computer.

View pictures, layouts and cropping options without a computer screen using the optional Color Preview Monitor ($79).

Crop, resize and select from various BorderFree™ templates (4x6, 5x7, 8x10) using the control panel. Then, save your favorite settings and recall them with Epson's exclusive One Touch button feature.

Leave the printer unattended while it prints and trims your photos automatically, using an exclusive built-in cutter and attachable roll paper holder. (Cutter with Stylus Photo 925 only.)

Get brighter colors, sharper detail and the most lifelike skin tones from a superior 6-color Photo Ink system with true black, 4-picoliter droplets and up to 5760 x 720 optimized dpi.

Ensure the quality of your prints with Epson's PRINT Image Matching™ (P.I.M.) technology – which makes automatic color corrections and adjustments when used with any P.I.M.-enabled digital camera.

Why do so many digital camera owners look to Epson for all their printing needs? Because only Epson makes photo printers designed to work specifically with digital cameras. For images with more color and detail than ever before. Which means now the image quality that could only be found in a professional photo lab is yours to create – right at home. As you can see, when it comes to digital pictures, no other photo printer comes close to giving you the quality and convenience you get with this printer. For more info, call 1-800-GO-EPSON or visit epson.com.

Epson Stylus Photo **825** and **925**

*Supports Compact Flash type I and II, Memory Stick, Smart Media, Secured Digital, MultiMedia and Microdrive (optional adapter needed for Compact Flash type II and Microdrive on SP 825; optional Zip! card reader needed for Secured Digital and MultiMedia on SP 925). Epson, Epson Stylus and PRINT Image Matching are trademarks/registered trademarks of Seiko Epson Corp. BorderFree is a trademark of Epson America, Inc. All other trademarks are properties of their respective companies. © 2002 Epson America, Inc. © Tim Hawley

DIGITAL CAMERAS

MIXED VERDICT ON PHOTO SENSOR

FOVEON'S HIGHLY ANTICIPATED X3 SENSOR DELIVERS SHARPER PICS, SOME GOOD COLOR.

CAPTURING razor-sharp and color-accurate photos can be a challenge even with today's multimillion-pixel digital cameras. But Foveon, an image-sensor company, promises to change all that with its much-anticipated Foveon X3 sensor, which is supposed to yield sharper photos with truer-to-life color than existing technologies can deliver.

But in our tests of the 3.4-megapixel Sigma SD9 ($1800), the first digital camera equipped with X3, we obtained mixed results: Images were sharp, but color accuracy varied. We compared the Sigma's images with output from the highly regarded 6.1-megapixel Nikon D100 ($2000). We shot images at the cameras' highest resolutions—2268 by 1512 for the Sigma, and 3008 by 2000 for the Nikon. Both are digital single-lens reflex cameras intended for professionals and advanced hobbyists, and buying either one counts as a serious investment, especially since the prices don't include lenses (from $400 to $600) or memory cards ($70 for a 128-MB CompactFlash card).

SIGMA'S SD9 SLR digital camera is the first to use the Foveon X3 image sensor.

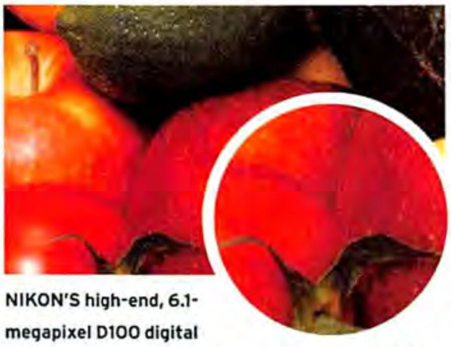
THE X3 FACTOR

AT THE HEART of the Sigma SD9 is the Foveon X3 image sensor. The X3 uses a new method for capturing information on a digital camera: Every pixel has three layers of photo detectors, each of which senses one of the three primary colors of light—red, green, or blue. Foveon's X3 then uses the data from these three layers to re-create the actual colors of the image (see "How It Works," page 36).

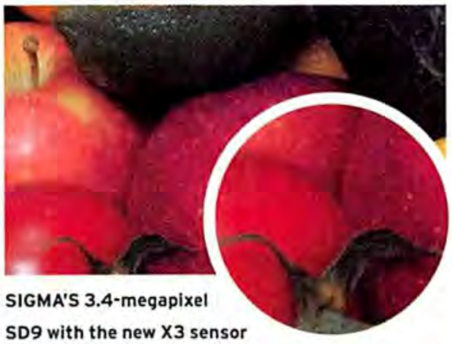
Current digital cameras use either a CMOS (complementary metal-oxide semiconductor) or—more commonly—a CCD (charge-coupled device) sensor whose pixels have one layer of photo detectors. To capture color, a filter for one of three colors (red, green, or blue) is placed on top of the pixel in a grid that looks like a three-color checkerboard. By measuring the red, green, and blue levels in three or more adjacent pixels, the camera calculates the original color. In some cases, the method a camera uses to interpret this data leads to artifacts and loss of detail in pictures—problems we've seen in many of our test images using cameras with a CCD or CMOS sensor.

In theory, the Foveon X3's approach, which offers three times the RGB informa- ▶

COMPARISON PHOTOS: NIKON VS. SIGMA



NIKON'S high-end, 6.1-megapixel D100 digital camera produced a vivid image but overemphasized yellows in the apples and tomatoes of our test shot.



SIGMA'S 3.4-megapixel SD9 with the new X3 sensor from Foveon captured truer reds for our apples and tomatoes but left yellows and oranges less vibrant.

IN BRIEF

Product Pipeline

CORPORATE AIM: Long popular with employees, AOL's free Instant Messaging service has occasionally run afoul of companies concerned about the product's use of unsecured public networks. Now AOL is offering a fee-based, business-oriented product called the AIM Enterprise Gateway that lets firms offer more-secure instant messaging. IDC says that by 2006 more than 40 percent of the expected 506 million people who'll be logging on to IM services worldwide will be business users.

Tidbyte

CASE CLOSED: Though a federal judge affirmed a settlement in the landmark antitrust suit against Microsoft, the debate over its impact continues. Some analysts believe the settlement should lead to more choices for consumers, but antitrust expert Donald Falk—a partner at the law firm of Mayer, Brown, Rowe & Maw in Palo Alto, California—takes the view that Microsoft got off much too lightly: "What the opinion said basically was, 'You robbed a bank, you can keep the money, and you can do it again, but don't use exactly the same method'."

Did You Know?

$8000

YOUR COMPANY will spend between $4500 and $8000 per year to keep your desktop PC up and running.

SOURCE: GARTNER

PHOTOGRAPHS: MARC SIMON (ABOVE); RICK RIZNER (BELOW)

SURE TO ENDURE

Every CTX FlatView™ monitor is designed to meet the rigors of our total quality management program. That's how we ensure reliable, lasting performance. And how we've built an impressive history of excellence and value.

Our 17" display family delivers uncompromising image resolution and color, as well as PC and Mac® compatibility. In fact, our Model PV720A with high-quality audio speakers was recently awarded PC Magazine Editors' Choice, c|net Editors' Top Five, and PC World's Top 10 Monitors recognition.

PC MAGAZINE EDITORS' CHOICE™
February 26, 2002
CTX PV720A
CTX International, Inc.

c|net Editors' Top Five 5
MAY 2002

PC WORLD TOP 10 MONITORS
Dec 2002

FREE Pivot Software Included

All three offer our innovative pivot function for versatility and convenient portrait viewing of Web pages, artwork or documents. And three attractive colors are available.

Visit www.ctxintl.com/wheretobuy to purchase your own CTX FlatView™ monitor today.

CTX

877-857-7846 • www.ctxintl.com

tion, should lead to a far better looking picture than existing technologies can provide.

SHARP SHOOTER

THE THEORY proved true, at least where sharpness was concerned. The images captured with the preproduction Sigma SD9 maintained their crisp edges both on screen and in print, even at 150 percent magnification, while photos taken with Nikon's D100 appeared a tad blurry when magnified at 150 percent.

Moreover, the SD9 captured fine details on an assortment of gray-scale bars and wheels, as well as black-and-white text, with minimum color interference. Other cameras that we've tested, including the D100, produced images with varying degrees of color distortion.

Color accuracy was another story: Both cameras' pictures were impressive but not perfect (see comparison photos, page 34). In comparing both sets of prints and on-screen images to the real McCoys, we saw that in some tests the SD9 accurately reproduced shades of red and green, but left yellows and oranges washed out. (We processed the images in Auto mode, as recommended by Foveon.) The SD9's images were duller than those of the D100, and their colors didn't pop out as much. The D100's images, on the other hand, looked too yellow.

We did find the Nikon camera a little faster at some tasks, as well as more intuitive, making it easier to use. And the Sigma saves images only in the X3's proprietary X3F format, which common image editing programs such as Adobe Photoshop can't read. You must convert the X3F files to either JPEG or TIFF format using the cumbersome Sigma Photo Pro bundled software (which was developed by Foveon) before you can open them in other applications.

THE UPSHOT?

OVERALL, the SD9 and the D100 each produced some good images and some bad. Variations in color, detail, and sharpness involve multiple factors: camera, lens, software, accuracy of color calibration between monitors and printers, and even the human eye. If you spot a flaw in an image, figuring out the cause of that imperfection can be extremely difficult.

Digital SLR cameras like the Sigma and Nikon provide a great deal of manual control, however, so users can capture the best possible picture. Although our tests indicate that both Foveon and Sigma still have work to do in improving performance and usability, if you're willing to tweak, you can enhance your results and enjoy sharper pics now. But to ensure that they get the most for their money, many users are probably better off waiting until a few more firmware upgrades are released. Don't expect to see Foveon's sensor in cameras from big-name vendors in the near future; companies like Nikon and Olympus are watching it but have made no announcements.

—*Grace Aquino*

PC World *Test Center Performance Analyst Tony K. Leung and Senior Performance Analyst Elliott S. Kirschling contributed to this article.* ▶

IN BRIEF

Product Pipeline

TWO KEYBOARDS IN ONE: Creative Labs' $100 Prodikeys is a standard-looking PC keyboard—except for 37 touch-sensitive keys that play music. Bundled with snazzy music software and a Sound Blaster card, it's a blast for kids who are just learning to play—and for grownups who never have. find.pcworld.com/32141

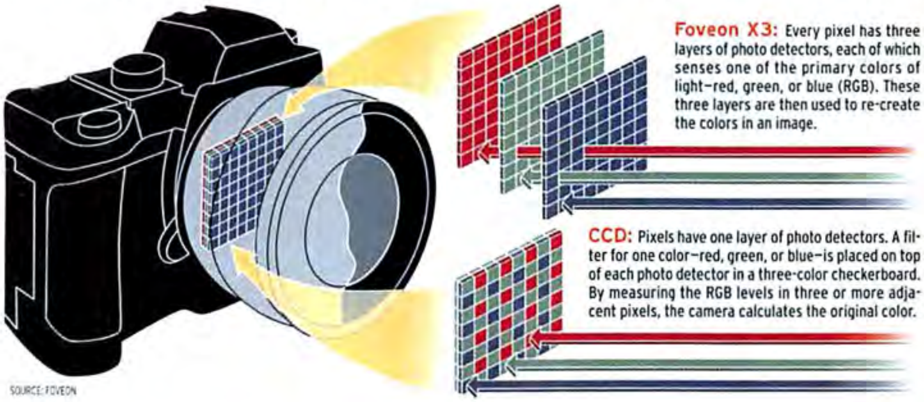
MEGA-MEGAPIXEL: Kodak announced it would begin shipping the first-ever 14-megapixel digital camera before the end of 2002, on the heels of Canon's plans to ship its 11-megapixel EOS-1Ds in early December. Kodak's new $4995 DCS Pro 14n is a single-lens reflex camera geared toward professional photographers, but it seems likely to tempt well-heeled amateur shutterbugs as well. find.pcworld.com/32129

Tidbyte

CHARGE IT: Neah Power Systems reports it is developing a fuel cell technology that could run one of today's notebooks two to three times longer than current rechargeable batteries. The process works by converting methanol with oxygen into electricity and heat. Don't ditch your current notebook battery just yet, however: Products bearing the up-and-coming technology will not arrive until at least 2005. find.pcworld.com/32165

HOW IT WORKS: X3 VS. CCD

THE SIGMA SD9 is the first digital SLR (single-lens reflex) camera to use Foveon's X3 image sensor. Standard digital cameras use a CCD (charge-coupled device) sensor. Here's how each sensor works.



Foveon X3: Every pixel has three layers of photo detectors, each of which senses one of the primary colors of light—red, green, or blue (RGB). These three layers are then used to re-create the colors in an image.

CCD: Pixels have one layer of photo detectors. A filter for one color—red, green, or blue—is placed on top of each photo detector in a three-color checkerboard. By measuring the RGB levels in three or more adjacent pixels, the camera calculates the original color.

SOURCE: FOVEON

Crisis prevention in a box.

Reliable data storage from Dell.

PowerVault 715N
DELL
PowerVault 775N

Dell | Storage Solutions

PowerVault™ PV725N Storage

Entry-Level NAS 1U Rack or Deskside Solution

- Intel® Celeron® Processor at 1.70GHz
- 384MB DDR SDRAM
- 4x40GB[5] IDE Hard Drive Storage
- Dual Intel® Gigabit※ NICs
- 1-Yr Next Business Day On-Site Service[1]
- Microsoft® Windows® Powered Network Attached Storage

$1799 as low as **$51**/mo., (46 pmts.*)
60 Days Same-As-Cash
E-VALUE Code: 15427-S21217s

PowerVault™ PV725N Storage

Scalable NAS 1U Rack or Deskside Solution at a Great Value

- Intel® Pentium® 4 Processor at 2GHz
- 512GB DDR SDRAM
- 4x80GB[5] IDE Hard Drive Storage
- Dual Intel® Gigabit※ NICs
- 1-Yr Next Business Day On-Site Service[1]
- Microsoft® Windows® Powered Network Attached Storage

$2499 as low as **$71**/mo., (46 pmts.*)
60 Days Same-As-Cash
E-VALUE Code: 15427-S21224s

PowerVault™ PV775N Storage

Performance NAS 2U Rack Solution

- Intel® Xeon® Processor at 1.80GHz (Up to 2.40GHz)
- Dual Processor Capable
- 512MB 200MHz DDR SDRAM (Up to 3GB)
- 2x18GB[5] (10,000 RPM) Ultra160 SCSI Hard Drive Storage
- Dual-Embedded Intel® Gigabit※ NICs
- Microsoft® Windows® Powered Network Attached Storage

$4999 as low as **$142**/mo., (46 pmts.*)
60 Days Same-As-Cash
E-VALUE Code: 15427-S21249s

Network Attached Storage from Dell. Easy-to-use data storage solutions with the performance and price you've come to expect from Dell. Storing data on a desktop or notebook is a risky proposition. No one ever thinks it will happen to them, but lost or corrupt data can have a devastating effect on an organization. Dell Network Attached Storage, available with up to 8.6 terabytes[5] of storage capacity, comes equipped with a snap shot back-up feature and single point of restoration, so data recovery takes minutes, not hours. And it can be up and running in as little as 15 minutes. Don't let data loss threaten you. Protect yourself, protect your organization.

Microsoft®
Windows®
Powered

Saving your critical data. Easy as DELL™

Click www.dell.com/nas Call 1-800-283-1480

Call: M-F 7a-8p Sat 8a-5p, CT

Pricing, specifications, availability and terms of offer may change without notice. Taxes and shipping charges extra, and vary. U.S. Dell Small Business new purchases only. Dell cannot be held responsible for errors in typography or photography. [1]Service may be provided by third-party. Technician will be dispatched if necessary following phone-based troubleshooting. Subject to parts availability, geographical restrictions and terms of service contract. Service timing dependent upon time of day call placed to Dell. U.S. only. [5]For hard drives, GB means 1 billion bytes and TB means 1 trillion bytes; accessible capacity varies with operating environment. *Monthly payment based on 48-month QuickLoan at 12.99% interest rate for qualified Small Business customers. Your interest rate and monthly payment may be same or higher, depending on your creditworthiness. Minimum transaction size of $500 is required. Maximum aggregate financed amount not to exceed $25,000. Under 60 Days Same-As-Cash QuickLoan, interest accrues during first 60 days after QuickLoan Commencement Date (which is five days after product ships) if balance not paid within these 60 days. OFFER VARIES BY CREDITWORTHINESS OF CUSTOMER AS DETERMINED BY LENDER. Taxes, fees and shipping charges are extra and may vary. Not valid on past orders or financing. QuickLoan arranged by CIT Bank to Small Business customers with approved credit. ※This term indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1GB/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required. Intel, Celeron, Pentium and Xeon are registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Dell, the stylized E logo, E-Value and PowerVault are trademarks of Dell Computer Corporation. Microsoft and Windows are registered trademarks of Microsoft Corporation. ©2002 Dell Computer Corporation. All rights reserved.

GO
Online For
Latest Prices
and Weekly
Promotions

rect • travel • personals • news • shopping • classifieds • maps • autos • careers • sports • cale
Get the latest gadgets
• new tech center
• buying advice and reviews
• compare millions of products
• go to shopping.yahoo.com
THE SOLAR SYSTEM
powered by hp
o • yellow pages • geocities • messenger • chat • launch • movies • lottery •
Do You Yahoo!?
• ga

Freeway Technology INC

ALL SYSTEMS INCLUDE:
* 3 Years Parts & Labor Warranty
* 30-Day Money-Back Guarantee
* FREE 6 Outlet Surge Protector
* Lifetime toll-free Technical Support
* FREE 1 Year Onsite Service

Freeway Innovation A3600M

- AMD ATHLON XP PROCESSOR
- 512MB PC133 SDRAM MEMORY
- 60GB 7200RPM ATA133 HARD DRIVE
- VIA KT266A CHIPSET BOARD W/USB2.0
- nVIDIA GF4 MX440 64MB DDR W/TV OUT
- SOUNDBLASTER LIVE 5.1
- INTEL 56K V.92 VOICE MODEM
- 10/100 BASE-T LAN
- LITE-ON 16X DVD & 1.44MB FLOPPY
- LITE-ON 48X16X48 CDRW DRIVE
- ATX 350W SUPER MED TOWER W/FRONT USB - BLACK
- LITE-ON INTERNET KEYBOARD - BLACK
- MICROSOFT INTELLI EXPLORER OPTICAL MOUSE (5 BUTTONS)
- CREATIVE INSPIRE 4400 5-PC SPEAKER SYSTEM - BLACK
- MS WINDOWS XP HOME EDITION
- **FREE** 2002 STAROFFICE SUITE
- **INCLUDES** VIEWSONIC 17" .25DPI FLAT CRT MONITOR - BLACK

Starts at $829

AMD Athlon XP 1700+	$829
AMD Athlon XP 1800+	$849
AMD Athlon XP 2000+	$859
AMD Athlon XP 2100+	$869
AMD Athlon XP 2200+	$939
AMD Athlon XP 2400+	$989

Freeway Innovation A7800-S

- AMD ATHLON XP PROCESSOR
- 512MB PC3200 DDR400 MEMORY
- 80GB 7200RPM ATA133 HARD DRIVE
- VIA KT400 DDR MOTHERBOARD W/USB2.0
- ATI RADEON 9000 128MB DDR W/TV OUT
- SOUNDBLASTER AUDIGY W/IEEE 1394
- INTEL 56K V.92 VOICE MODEM
- 10/100 BASE T LAN
- LITE-ON 16X DVD-ROM & 1.44MB FLOPPY
- LITE-ON 52X24X52 CDRW DRIVE
- ENERMAX 420W MED ATX TOWER W/SEE-THRU WINDOW & SOUND ACTIVATED NEON LIGHT - BLACK
- LITE-ON INTERNET KEYBOARD - BLACK
- MICROSOFT INTELLI EXPLORER OPTICAL MOUSE (5 BUTTONS)
- ALTEC LANSING 251 6-PC 5.1 SPEAKER SYSTEM - BLACK
- MS WINDOWS XP HOME EDITION
- **FREE** 2002 STAROFFICE SUITE
- **INCLUDES** VIEWSONIC 19" .25DPI FLAT CRT MONITOR – BLACK

Starts at $1259

AMD Athlon XP 2100+	$1259
AMD Athlon XP 2200+	$1329
AMD Athlon XP 2400+	$1379
AMD Athlon XP 2600+	$1479

Freeway Velocity i30

- AMD ATHLON XP PROCESSOR
- 512MB PC2700 DDR333 MEMORY
- 60GB 7200RPM ATA133 HARD DRIVE
- ASUS DDR333 MOTHERBOARD
- nVIDIA GF4 MX440 64MB DDR W/TV OUT
- SOUNDBLASTER LIVE 5.1 SOUND
- INTEL 56K V.92 VOICE MODEM
- 10/100 BASE T LAN
- LITE-ON 16X DVD-ROM
- LITE-ON 48X12X48 CDRW DRIVE
- 1.44MB FLOPPY
- ENERMAX 350W MED ATX TOWER W/SEE-THRU WINDOW - BLACK
- LITE-ON INTERNET KEYBOARD - BLACK
- INTERNET (SCROLL) MOUSE - BLACK
- CREATIVE INSPIRE 4400 5-PC SPEAKER SYSTEM - BLACK
- MS WINDOWS XP HOME EDITION
- **FREE** 2002 STAROFFICE SUITE
- **INCLUDES** VIEWSONIC 17" .25DPI FLAT CRT MONITOR - BLACK

Starts at $959

AMD Athlon XP 2000+	$959
AMD Athlon XP 2100+	$969
AMD Athlon XP 2200+	$1039
AMD Athlon XP 2400+	$1089
AMD Athlon XP 2600+	$1189

Intel Workstation 500P

- INTEL PROCESSOR
- 512MB PC133 SDRAM MEMORY
- 60GB 7200RPM ATA133 HARD DRIVE
- P4 SIS CHIPSET BOARD W/USB2.0
- SAVAGE4 2D/3D GRAPHIC 64MB SHARED
- AC97 3D SOUND
- INTEL 56K V.92 VOICE MODEM
- 10/100 BASE T LAN
- ACER (BENQ) 56X CD-ROM
- optional LITE-ON 48X16X48 CDRW DRIVE +$55
- 1.44MB FLOPPY
- ATX 350W SUPER MED TOWER W/ FRONT USB
- WINDOWS INTERNET KEYBOARD
- 180W 2 PIECES STEREO SPEAKERS
- LOGITECH USB OPTICAL SCROLL MOUSE
- MS WINDOWS XP HOME EDITION
- **FREE** 2002 STAROFFICE SUITE
- **INCLUDES** 15" (VIEWABLE) LCD FLAT PANEL MONITOR

Starts at $739

CELERON 2.0GHz	$739
P4 1.7 GHz	$789
P4 1.8A GHz (512K)	$809
P4 2.0A GHz (512K)	$829
P4 2.4A GHz (512K)	$869
P4 2.53A GHz (512K)	$919

Freeway Innovation i4500M

- INTEL P4 PROCESSOR
- 256MB PC2700 DDR333 MEMORY
- 60GB 7200RPM ATA133 HARD DRIVE
- INTEL 845 CHIPSET BOARD W/USB2.0
- ATI RADEON 9000 128MB DDR W/TV OUT
- SOUNDBLASTER LIVE 5.1
- INTEL 56K V.92 VOICE MODEM
- 10/100 BASE T LAN
- LITE-ON 16X DVD-ROM
- LITE-ON 52X24X52 CDRW DRIVE
- 1.44MB FLOPPY
- ENERMAX 420W MED ATX TOWER W/SEE-THRU WINDOW & SOUND ACTIVATED NEON LIGHT
- MICROSOFT INTERNET KEYBOARD
- MICROSOFT INTELLIMOUSE OPTICAL (5 BUTTONS)
- ALTEC LANSING AVS500 5-PC SPEAKER SYSTEM
- MS WINDOWS XP HOME EDITION
- **FREE** 2002 STAROFFICE SUITE
- **INCLUDES** VIEWSONIC 17" .25DPI FLAT CRT MONITOR

Starts at $999

P4 1.7GHz	$999
P4 1.8A GHz (512K)	$1019
P4 2.0A GHz (512K)	$1039
P4 2.40 GHz (533MHZ)	$1079
P4 2.53 GHz (533MHZ)	$1129
P4 2.66 GHz (533MHZ)	$1199
P4 2.80 GHz (533MHZ)	$1299

Freeway Velocity i35

- INTEL P4 PROCESSOR
- 512MB PC2700 DDR333 MEMORY
- 60GB 7200RPM ATA133 HARD DRIVE
- ASUS P4B533 BOARD W/USB2
- nVIDIA GF4 MX440 64MB W/ TV OUT
- SOUNDBLASTER LIVE 5.1 SOUND
- INTEL 56K V.92 VOICE MODEM
- 10/100 BASE T LAN
- LITE-ON 16X DVD-ROM
- LITE-ON 48X16X48 CDRW DRIVE
- 1.44MB FLOPPY
- ENERMAX 350W MED ATX TOWER W/SEE-THRU WINDOW
- MICROSOFT INTERNET KEYBOARD
- LOGITECH USB OPTICAL SCROLL MOUSE
- ALTEC LANSING AVS500 5-PC SPEAKER SYSTEM
- MS WINDOWS XP HOME EDITION
- **FREE** 2002 STAROFFICE SUITE
- **INCLUDES** VIEWSONIC 17" .25 DPI FLAT CRT MONITOR

Starts at $1099

P4 2.0A GHz (512K)	$1099
P4 2.40 GHz (533MHZ)	$1139
P4 2.53 GHz (533MHZ)	$1189
P4 2.66 GHz (533MHZ)	$1259
P4 2.80 GHz (533MHZ)	$1359

Visit us at **www.freewaytech.com** for 24 hour secure ordering
or call toll-free **866.384.3888** Mon-Fri 9am-6pm Sat 9am-2pm PST

Prices and configurations are subject to change without notice. Not responsible for typographical errors. Photos may not represent actual products. Valid RMA number required for all returns. Shipping charges are not refundable and are deducted from price. No refunds will be made for merchandise returned after 30 days from the date of the invoice. Buyer is responsible for all freight costs on all returns of merchandise. Credit will not be given for incomplete or damaged returns. All systems come with a 3 year limited warranty and 30-day money-back guarantee.

FREEWAY TECH
Freeway Technology INC

PREVIEW

MICROSOFT'S NEXT OFFICE: MORE THAN MEETS THE EYE

OUTLOOK REDO, ENHANCED XML SUPPORT ARE KEY IMPROVEMENTS.

MICROSOFT'S LATEST biennial remodel of Office is now in beta testing. We took it out for a spin. Result? Except for a major overhaul of Outlook, the upgrade looks much like today's model—on the surface.

But under the hood, the new version of the market-leading productivity suite—which is due to ship in mid-2003 and requires Windows XP or Win 2000—introduces changes that could eventually be significant for individuals and businesses alike.

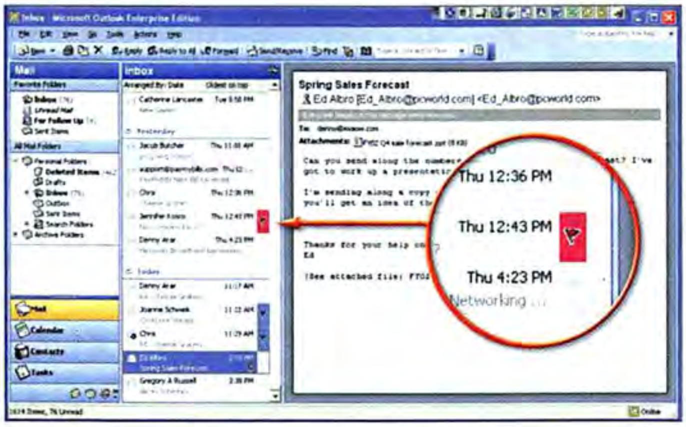
The biggest innovation in Office 11 (the upgrade's code name) is enhanced support for XML (Extensible Markup Language, an open standard for data and formatting). In the short term, this will most benefit workers who currently have to transfer information from industrial-strength non-Office apps like Oracle and SAP databases to their Office documents manually, and vice versa. For example, with Office 11 you can link fields in an Excel spreadsheet to any database that uses the increasingly common XML interface.

A few years from now, even noncorporate types will find Office's XML support useful, as businesses of all kinds begin generating XML-based online forms, says Forrester analyst Frank Gillett. These forms will be convenient alternatives to today's cumbersome Web forms. You could, for example, download an XML-compliant Word or Excel credit card application, fill it out, and submit it either by clicking on a button included in the form or by using a browser (similar to the way that you upload photos to online albums).

Because the file would remain live, you could later correct something in the associated database—an address or phone number, perhaps—by simply changing and resubmitting the document. Try doing that on the Web today!

NEW OUTLOOK

OFFICE 11 USERS will quickly notice the renovated Outlook. The in-box and preview pane, instead of being stacked horizontally, are by default side-by-side, which enlarges the preview but squishes subject lines and other in-box data. I liked it. I also appreciated that, by default, Outlook no longer automatically downloads embedded graphics files from external Web sites—a welcome privacy feature.



VERTICAL OPTION: By default, the new Outlook opens in three columns and lets you assign colored flags to messages for easy identification later on.

You can assign colored flags to mark messages for subsequent follow-up (regrettably, however, the feature does not work when you use Outlook to read Microsoft's own Web-based MSN or Hotmail). You can save search parameters to a folder so that the search is performed on all incoming mail, and updated results will always be available in that folder. The new Outlook also allows you to preview incoming messages, even if the app is minimized, via small semitransparent windows that pop up; identify the sender, subject line, and some text; and then fade away like an all-text Cheshire cat.

The new suite's overall blue, beige, and mustard color palette seems inspired by the look of Mac OS X. Enhanced integration with SharePoint Team Services (Microsoft's online-collaboration service) makes it easier for several people to work on a single document at the same time without inadvertently overwriting one another's revisions.

Microsoft has not yet announced pricing for Office 11, but people who use Office primarily on their own for correspondence and spreadsheets probably won't find the new version a must-have upgrade: Forrester's Gillett says that XML won't really matter to the masses until at least 2004, and the Outlook changes aren't vital. But the technology that lies beneath them may eventually make Office 11 worth the investment for everyone.

—Yardena Arar ▶

IN BRIEF

Downloads

Head to find.pcworld.com/32120 to locate these files.

TOP 5

1. **Ad-aware 5.83** 872KB
   Rid your system of annoying advertising spyware with this freeware utility.
2. **RegClean 4.1a** 800KB
   Thoroughly cleanse your Windows Registry of corrupted or unused Registry keys.
3. **Matrix Screen Saver** 1.73MB
   Make your monitor emulate the trickling green glyphs from the hit science fiction film.
4. **ZoneAlarm 3.1.291** 3.4MB
   Get dependable protection for DSL and cable connections with this free utility.
5. **Free Zipper** 845KB
   This utility delivers all the compression functionality you could possibly need—for free.

Amazing ★★★★★ Performance!

– PC Magazine®

Google
GYRATION
ULTRA
CORDLESS
OPTICAL
MOUSE

On the desk, in the air, anywhere! Relax, put your feet up and compute in comfort! Ultra's gyroscopic sensor tracks the motion of your hand and moves the cursor in perfect unison.

- 25 foot range
- Precise optical sensor
- In-air cursor control
- Rechargeable

Ultra Mouse. The world's only in-air cordless optical mouse.

With one smooth, swift move across your desktop, you'll know why the Gyration Ultra Cordless Optical Mouse is a star. Then pick it up, and you'll agree why PC Magazine gave it five. Ultra Mouse performs amazing feats never before seen from an optical mouse. It's all possible thanks to gyroscopic technology, which allows you to control your PC from a comfortable position using natural hand movements. And with Ultra Mouse's long-life rechargeable battery, the performance goes on and on.

Get in on the act now.

Gyration Ultra Cordless Optical Mouse is Windows® and Macintosh® compatible. Just plug it into the USB port. No software to load. "... perfect for home entertainment, small-scale presentations, or just wowing your friends."* Order yours online at www.gyrationultra.com.

Gyration

"5-Star Award Winner"
PC MAGAZINE
www.pcmag.com
●●●●●
October 15, 2002
Ultra Cordless Optical Mouse
Gyration, Inc.

Pick one up at your nearest computer retailer: STAPLES MICRO CENTER THE COMPUTER DEPARTMENT STORE® CDW® FUTURESHOP® TigerDirect.com Fry's

* PC Magazine, October 15, 2002

©2002 Gyration, Inc. Gyration Ultra Cordless Optical Mouse is a trademark of Gyration, Inc. All other trademarks or registered trademarks are of their respective companies.

PRESENTATIONS

WI-FI PROJECTORS: KEEP THE CABLES

BEAM YOUR SLIDES? NICE IDEA, BUT...

TIRED OF FIDDLING with cables when you make a presentation? A new generation of Wi-Fi–enabled projectors let you transmit a PowerPoint show wirelessly from a notebook 150 feet away. In theory, this would allow several people to easily present from their own notebooks in rapid succession. But the reality fell short in our tests.

We looked at four shipping projectors that had wireless connectivity options: NEC's LT260, Sharp's Notevision PG-M25X, Sony's VPL-PX15 SuperSmart, and Toshiba's TLP-T501U (see the chart below). All four offer 1024-by-768 resolution and a slot for an 802.11b (Wi-Fi) PC Card.

Though we were generally impressed with the quality of the displays, they cost at least $1000 more than similar units without wireless capability. Also, setup can take as much time as hooking up a cable—and don't plan on presenting a multimedia extravaganza.

SHARP'S Notevision PG-M25X (left) and Sony's VPL-PX15 SuperSmart accept 802.11b PC Cards for wireless transmissions.

We tested the projectors by using a Windows XP–based Compaq notebook with built-in Wi-Fi capability to transmit a PowerPoint presentation.

LIMITED CONNECTIONS

SOME UNITS came with a Wi-Fi card that had already been configured for ad hoc (peer-to-peer) networking—useful if your location lacks an existing wireless network. If you want to demo a live Web site, however, you must connect to the Internet via an access point or gateway (in infrastructure mode)—something you can do with all of the projectors except the Sharp.

Setup—including changing the notebook's wireless network settings to match those of the projector being tested—took 20 to 30 minutes. Each model comes with software for transmitting images and presentations wirelessly. The Sony unit runs Windows CE apps for viewing presentations and images that you transfer to the projector.

Unfortunately, when we at last displayed our PowerPoint test file, we quickly discovered a major limitation of Wi-Fi for presentations: The narrowness of its bandwidth (real-world speeds of about 4.5 megabits per second) precludes video and audio transmissions. We even noticed a heartbeat's lag between the appearance of still images on our notebook and on the projector screen.

To gauge how easy it was to switch between users working with different notebooks, we tried using a second Wi-Fi–enabled Compaq notebook with each projector. With all but the Sharp, though, we had difficulty in making a smooth switch. And you can't wield the Sharp remote as a mouse when you connect wirelessly.

Overall, we found that the convenience of these first Wi-Fi–enabled projectors wasn't worth the setup hassles, content limitations, and added expense. The good news: All four come with cables for more-conventional operation.

—*Richard Jantz* ■

XGA PROJECTORS GO WIRELESS

PROJECTOR	Street price	Wi-Fi PC Card	Weight (lb)	Display type/ brightness (ANSI lumens)	Lamp life (hours)/ replacement cost	Displays live Web sites?	Remote mouse
NEC LT260 find.pcworld.com/32150	$3595	None[1]	6.5	DLP/2100	1500[2]/$449	Yes	Yes[3]
Sharp Notevision PG-M25X find.pcworld.com/32153	$5295	2	5.8	DLP/1900	2000[4]/$406	No	No
Sony VPL-PX15 SuperSmart find.pcworld.com/32156	$4600	1[5]	11.7	LCD/2000	1500/$500	Yes	Yes[6]
Toshiba TLP-T501U find.pcworld.com/32159	$4695	1	9	LCD/1600	2000/$439	Yes	Yes[7]

[1] Compatible Wi-Fi 802.11b PC Card (for projector) costs $65–$119 extra.

[2] 2000-hour lamp life in Eco-mode.

[3] Requires optional $20 USB receiver.

[4] Issues warning at 1900 hours.

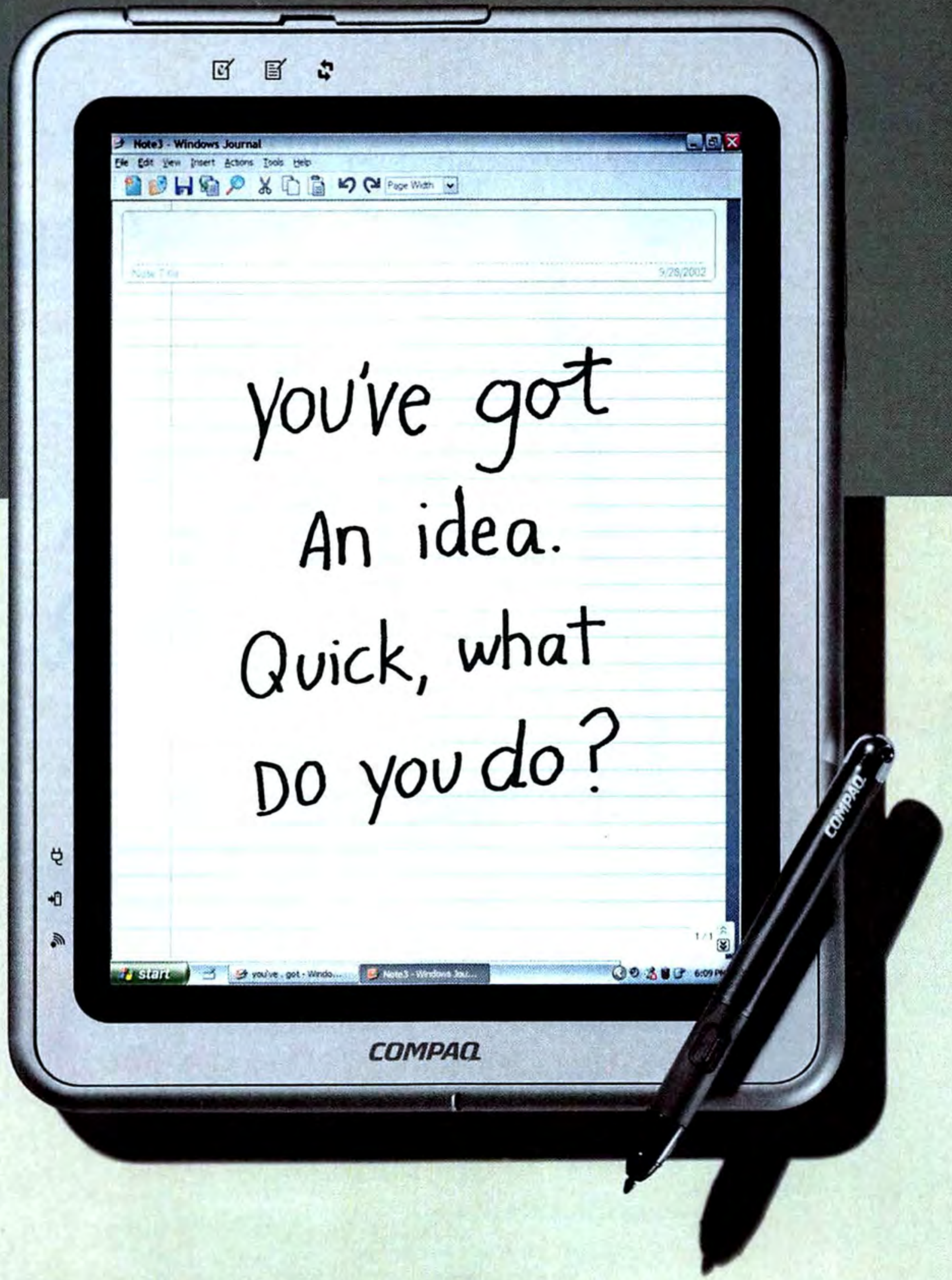
[5] Also has wired LAN (ethernet) connection port.

[6] Controls only Windows CE apps on projector.

[7] Via included USB-connected receiver.

PHOTOGRAPHS: MARC SIMON

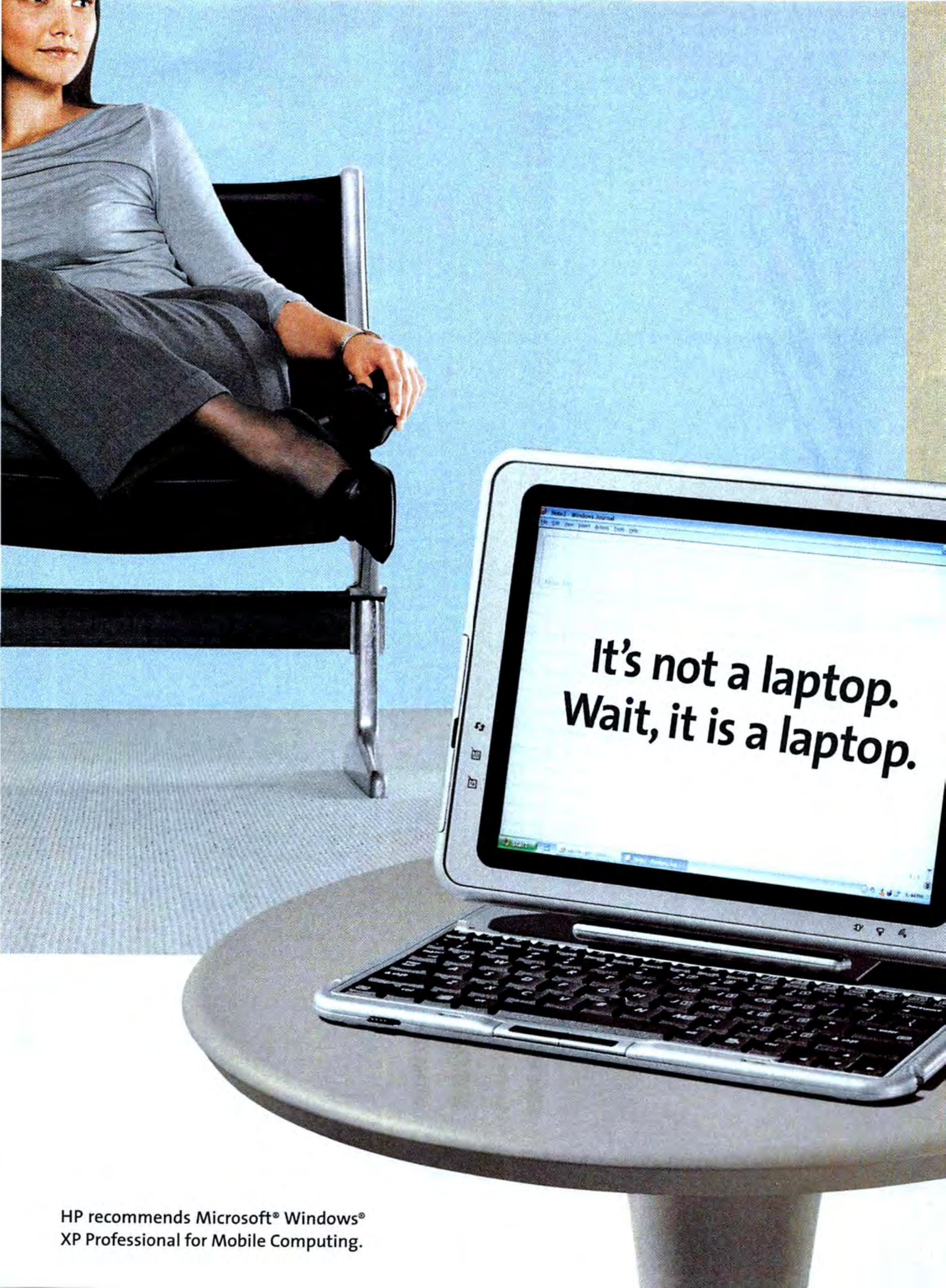
HP recommends Microsoft® Windows®
XP Professional for Mobile Computing.


Note3 - Windows Journal
File Edit View Insert Actions Tools Help
Page Width
9/28/2002
you've got
An idea.
Quick, what
Do you do?
start
COMPAQ
COMPAQ

Note3 - Windows Journal
File Edit View Insert Actions Tools Help
Note Title
this.
start
Evo

HP recommends Microsoft® Windows®
XP Professional for Mobile Computing.

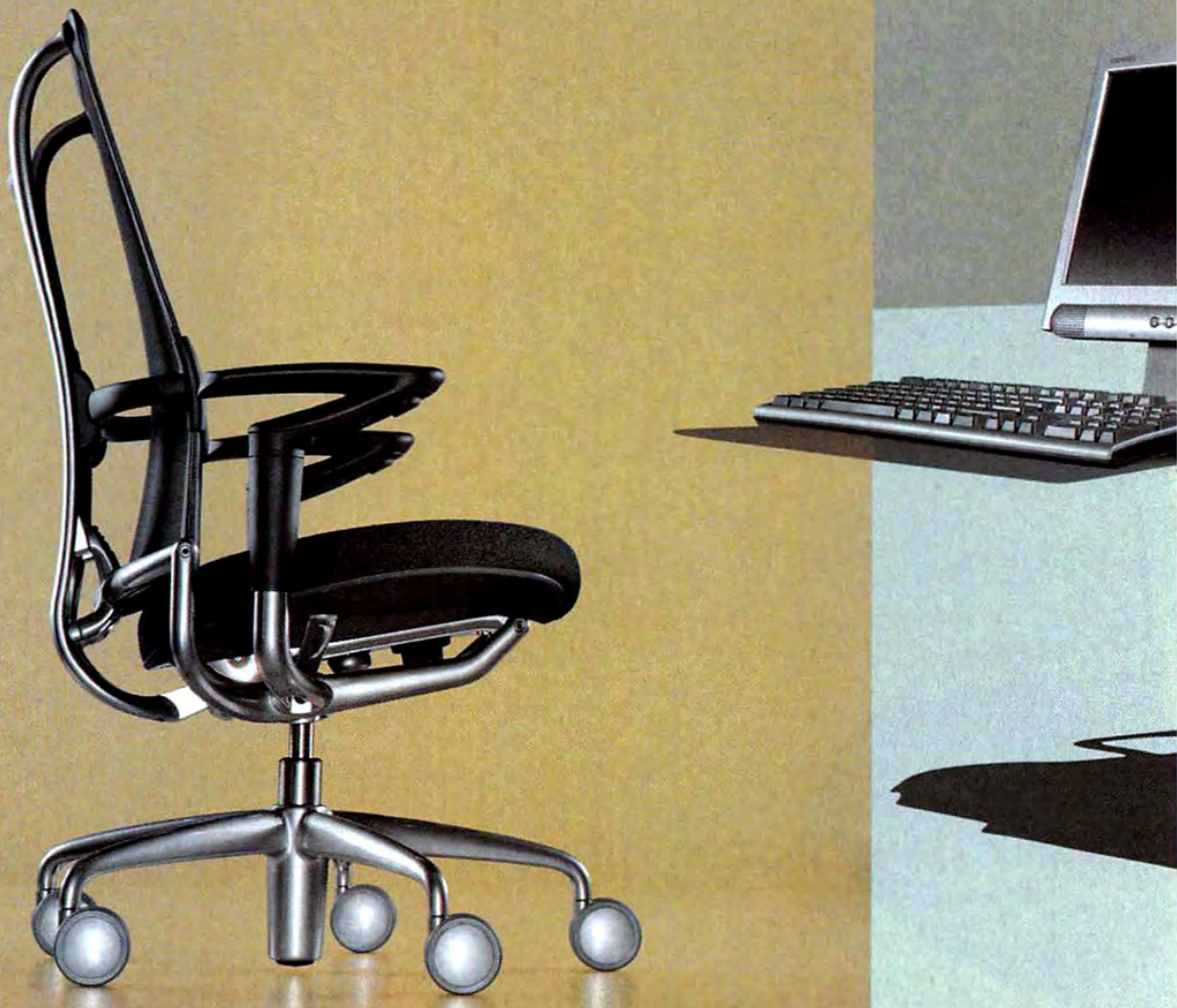
Wouldn't it be great if using a portable computer could be as intuitive as writing? Well, now it is. Introducing the Compaq Tablet PC. It runs Microsoft® Windows® XP Tablet PC Edition, so the Compaq Tablet PC lets you jot down your ideas right on the screen. But that's only part of how this new kind of computer lets you work in new kinds of ways.


It's not a laptop.
Wait, it is a laptop.

HP recommends Microsoft® Windows®
XP Professional for Mobile Computing.

Just because you don't need to use a keyboard with the Compaq Tablet PC doesn't mean you can't. Simply connect the included one and you're off and typing. Now when your work environment changes, your computer can, too.

Even if you're a Plutonium 1,000,000 K Club business traveler, you'll have to come back to the office eventually. When you do, just set your Compaq Tablet PC in its optional dock and you're good to go. Or stay, as the situation requires.



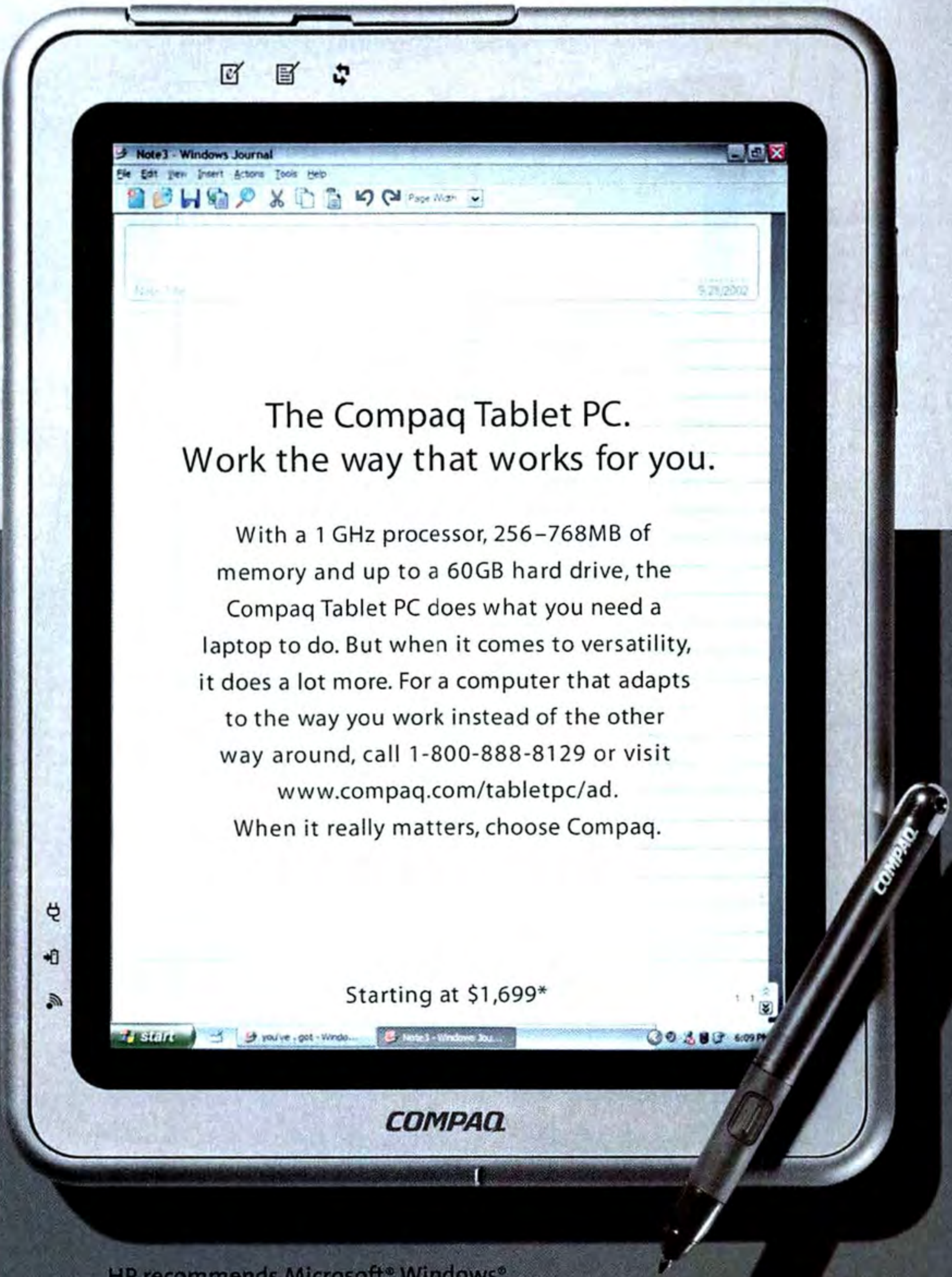
HP recommends Microsoft® Windows® XP Professional for Mobile Computing.

Shown monitor, keyboard and mouse sold separately.

Note1 - Windows Journal
File Edit View Insert Actions Tools Help
Page Width
It's a desktop, laptop.
start
you've got - Windo...
Note1 - Windows Jou...
COMPAQ

invent

COMPAQ


Note3 - Windows Journal
File Edit View Insert Actions Tools Help
start
COMPAQ
COMPAQ

The Compaq Tablet PC.
Work the way that works for you.

With a 1 GHz processor, 256–768MB of memory and up to a 60GB hard drive, the Compaq Tablet PC does what you need a laptop to do. But when it comes to versatility, it does a lot more. For a computer that adapts to the way you work instead of the other way around, call 1-800-888-8129 or visit www.compaq.com/tabletpc/ad.

When it really matters, choose Compaq.

Starting at $1,699*

HP recommends Microsoft® Windows® XP Professional for Mobile Computing.

© 2002 Hewlett-Packard Company. *Estimated U.S. retail price. Actual prices may vary. Shipping, handling and taxes not included. Docking station sold separately. Microsoft® and Windows® are U.S. registered trademarks of Microsoft Corp.

LETTERS

LETTERS@PCWORLD.COM

E-SHOPPING SECURITY

INK JET PRINTS THAT LAST

SITES FOR FREE E-BOOKS

HOLLYWOOD VS. YOUR PC

PHOTOGRAPH: RICK RIZNER

COPY RIGHTS AND WRONGS

DYLAN F. TWENEY's article "Hollywood vs. Your PC" [November], describing the prospect of copy-protection hardware, does not do justice to the bigger picture. Digital distributors want to overcome the public-domain provision of copyright law by wrapping content in an unbreakable digital format that they control. The original copyright act allowed content creators to profit from their work for a limited time, provided such work was actually disclosed (published) and eventually made available for free (public domain). Digital distributors want to hold copyrights in perpetuity and are trying to control all data processing with their demands. I, for one, do not want their intrusion.

Stephen Richard Levine
Westlake Village, California

SITES LIKE THE late Napster and the alive-and-well Kazaa exist for one purpose: to facilitate the illegal distribution of copyrighted material.

Is it any wonder that the recording and motion picture industries are responding by using their monetary and political clout to impose draconian copy-protection schemes on equipment manufacturers?

I am reminded of a line from the old *Pogo* comic strip: "We have met the enemy and he is us."

James J. Dunbar, Colorado Springs

CALIFORNIA Representative Howard L. Berman's efforts to unplug peer-to-peer networks might be good training for going after the really big theft network. I'm talking about libraries. Hundreds of thousands of them all around the world let people check out books and read every word without paying a cent to the publisher or the author. I hope Rep. Berman can put a stop to this unconscionable behavior.

Joey Harrison, Toledo

IF YOUR COMPUTER were hacked to enforce copyright laws [as the Berman bill would apparently allow], how could you track the source of the attack? To take legal action for the damages, you would have to know who attacked you.

Also, if a commercially produced CD/DVD crashes your computer to the point of requiring a manufacturer repair, as mentioned in the article, wouldn't the maker of that disc be liable—especially if there is no disclaimer or warning? How many class-action suits would follow?

Paul Sarran, via the Internet

E-BOOKS FOR FREE

BRAD GRIMES listed sites that sell e-books ["Read Any Good E-Books Lately?" *Web Savvy*, November], but a person just getting into this medium probably would not want to spend much. A page from Barnes & Noble's site (ebooks.bn.com/ms_reader/special_features/free_ebooks.asp) lets you download free, full-version e-books. You can also download dictio- ▶

LETTER OF THE MONTH

No Security in the Padlock Icon

IN NOVEMBER'S *Bugs and Fixes,* Stuart J. Johnston states, "We have grown to believe that if we see the little padlock icon at the bottom of Internet Explorer screens, our transactions are safe." He then talks about a vulnerability that might let bad guys pose as a real site and get your credit card information.

The problem is actually worse than that. I wrote a paper in 1999 entitled "Are Secure Internet Transactions Really Secure?" The paper can be found online at jsweb.net/paper.htm.

This paper discusses how many businesses—particularly small businesses—use third-party hosting. The little padlock indicates only that the connection from your browser to the site server is secure. It does not tell you how the company transfers your data from the server back to where the company can process it. In many cases sites use formmail.cgi or cgiemail.cgi to package the form data and e-mail it back to the business in plain text. If you were willing to send your data to the business in plain text, why wouldn't you just do that instead of using a secure form? In cases like this, the business is simply providing a false sense of security.

Unfortunately, consumers have no easy way—if any way at all—to determine whether the business is using a third-party server and an insecure back-end processing system.

Stephen Mencik, CISSPACS Defense
Gambrills, Maryland

naries for free at www.microsoft.com/reader/download_dictionaries.asp. For both sites, you'll need to use Microsoft Reader to read the books.

Kevin Li, via the Internet

BETTER, NO-FADE PRINTS

YOUR ARTICLE "The Fade Factor" [*News and Trends*, November] should have said that you *must* use only the papers that are listed in a printer's menu. Stray from this list, and your print quality will probably deteriorate. Each printer should make very good photo prints—*if* you stick with only the specified papers.

Glenn MacRill, Houston

AS YOUR PIECE points out, photo prints from ink jets are subject to premature fade and color shift over time, and such changes will differ dramatically from one ink jet printer manufacturer to another.

However, the article does not mention third-party ink and paper developers, such as our company. These firms, we believe, have been vital in pushing original equipment manufacturers to raise the bar in promises of long-lasting photographic prints from ink jets.

For example, in the charts of Wilhelm Imaging Research, our Generations Ink and Media have obtained longevity results well beyond those of any of the manufacturers mentioned (more than 100 years).

Norm Levy, President, MediaStreet.com

PC World *welcomes letters to the editor. We reserve the right to edit for length and clarity. Send e-mail to letter@pcworld.com.* ■

CORRECTIONS

IN THE DECEMBER issue's *Top 10 Printers* chart of color lasers, some specifications for the Toshiba E-Studio 6CP were in error; the correct specs: Rated at 24 ppm monochrome/6 ppm color; 1200-by-1200-dpi maximum resolution; 250 sheets input. Also, the number seven product should have been listed as the HP Color LaserJet 4600n, with a street price of $2369.

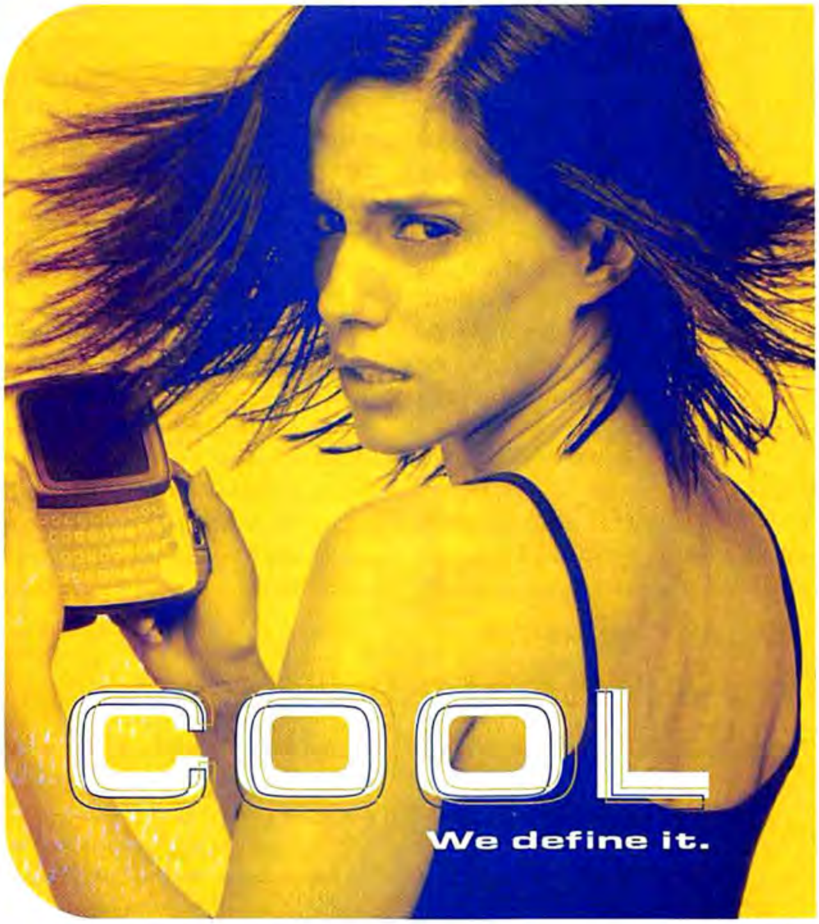
In November's "The Fade Factor" (*News and Trends*), the "How We Test" footnote to the chart on page 20 should have said that the tests used room illumination of 450 lux.

November's "Full Exposure" should have said that the Olympus C-4000 Zoom does not record audio.

November's *Internet Tips* should have referred to Sygate's Personal Firewall, which is the free version of the company's top-rated "Pro" product.

In July's "Protect Your PC," our story should have said that the Brilliant 3D viewer that was installed along with the Kazaa file-sharing application was accompanied by client software for a soon-to-be-activated distributed processing network. According to Brilliant, users will be invited to opt in before their PC is connected to the network.

PC World regrets the errors.



2003 International CES®

JANUARY 9-12, 2003 LAS VEGAS, NEVADA USA

Cool. Way cool. Insanely cool. Outrageous, gotta-have-it cool. 100,000 arbiters of cool wouldn't miss the 2003 International Consumer Electronics Show. Ideas and products from 2,000 leading companies. Industry players from 100 countries. The launch pad for countless new products. More media coverage than any other single event. What could be cooler?

www.CESweb.org

2003 International CES
DEFINING TECHNOLOGY'S FUTURE
PRODUCED BY CEA

Abood (and the rest of our team) would be happy to help you configure your Anthro workstation.

We've got furniture solutions for every passion.

Software Engineer, Musician, Graphic Designer, Video Editor. Whatever your passion, Anthro is there with the furniture solutions you need. Everything from Anthro is flexible, modular and strong. Configure it exactly to your specs and enjoy our Lifetime Warranty. We've got experts standing by the phone or online who can help you put together the Anthro furniture your spirit requires.

Contact us at ANTHRO.COM or 1-800-325-3841

ANTHRO®
TECHNOLOGY FURNITURE®

©2002 Memorex Products, Inc.

Is it live or is it Memorex?™
Memorex
DVD+R
FOR PC OR HOME
RECORDABLE
SINGLE
RW
DVD+R
Memorex
DVD+RW
DVD+RW/+R
JustLink
Memorex
RW
disc

What you're looking for when you know what to look for.

The ultimate recordable DVD solution from the leader in digital media.

If you demand the best in DVD recording, we have three reasons why Memorex is exactly what you're looking for: performance, compatibility and trust. First of all, our internal DVD +RW/+R ReWritable Drive offers the industry's fastest recording rates, writing +RW and +R discs at 2.4x speed and reading DVD-ROM at 8x. What's more, our +RW formats allow you to edit your videos without having to rewrite the entire DVD—an enormous time-saver. Plus, our intuitive software makes the whole formatting process quick and easy. Secondly, our +RW and +R DVDs provide maximum compatibility. So whether you capture video, save photos or just transfer data, your DVDs will be compatible with most computers and home DVD players. Finally, Memorex has been one of the most trusted and popular selling brands of digital media for the past ten years. So if you're truly serious about digital video, log onto www.memorex.com. Because Memorex recordable DVD is everything you're looking for.

Memorex
RW
DVD+ReWritable
DVD+RW
REWRITABLE
4.7GB 120

> High-performance recording

Our internal drive lets you write DVD +RW and DVD+R formats at 2.4x speed, read DVD-ROM at 8x speed and burn CDs at 12x (CD-R) and 10x (CD-RW).

> Maximum compatibility

Memorex +RW and +R formats offer unparalleled compatibility, so you can be confident that your DVD videos, work files and other data can be shared with friends, co-workers and family.

Memorex®
Is it live or is it Memorex?™

PLUGGED IN

STEVE FOX

Desktop Prices Hit Rock Bottom

Plus: Small software, ripping Redmond, Sidekick soars, and pop-ups go down.

1 Obscenely Cheap PCs

The Buzz: Yeah, the cover of this issue says January, but I know you're reading it in December. In which case, you may have noticed something about current desktop prices: They're stunningly low. Slumping summer sales hit PC vendors hard, and then back-to-school sales fizzled, too. The result? "There's excess capacity, and components aren't in short supply," says Gartner research director Mark Margevicius, and that has led to "eye-opening pricing" on desktops.
Bottom Line: Price watchers usually recommend waiting till mid-January to snag a marked-down machine. That probably isn't necessary this year, since the the holiday price slashes leave little more to cut. How novel—Christmas in December!

2 Shrinking Software

The Buzz: Score one for common sense, as software publishers have realized that they don't need a box the size of the Manhattan Yellow Pages to house a CD-ROM. That means those unwieldy software boxes of yore have shrunk to the size of the latest Tom Clancy paperback.
Bottom Line: Finally, corporate downsizing even Michael Moore would applaud.

3 Grumbling About Microsoft

The Buzz: Customer outrage directed toward Redmond is nothing new. But Microsoft's recent changes to its software licensing plans—to extract extra moolah from some of the company's biggest customers—have many corporate knickers in a twist. So much so that Linux is starting to look good: According to a recent Yankee Group study, nearly 40 percent of corporations worldwide claim they're giving the open-source OS serious consideration.
Bottom Line: CEO Steve Ballmer insists Microsoft was just trying to "simplify" licensing. Yep. You simply give Microsoft more money.

4 Sidekick Breakout

The Buzz: T-Mobile's wireless Sidekick handheld—one part e-mail device, one part phone, and one part Web-enabled PDA—is the year's breakthrough gizmo. Though its always-on e-mail and thumb keyboard recall corporate darling BlackBerry (dubbed "CrackBerry" because of its addictive nature), the device is primarily a consumer gadget. Built by California start-up Danger, the Sidekick is the size of an overstuffed wallet and retails for $250, plus a $40 monthly service fee. For more on the Sidekick, see "The New (Improved?) Wireless Web," page 133.
Bottom Line: Catherine Zeta-Jones wants you to buy one. You need another reason?

5 The Pop-Up Goes Down

The Buzz: Responding to user kvetching, sites are weaning themselves off the pop-up (and pop-under) ad. EarthLink now supplies pop-up–killing software, while AOL, Ask Jeeves, and other Web sites have recently banned the nasty beasties.
Bottom Line: Nice to see Internet companies listening to consumers. Now let's see them get rid of Flash time-wasters and similarly intrusive ad "innovations." After all, if I really wanted to see ads every few seconds, I'd watch TV. ■

Contributing Editor Steve Fox covers buzzworthy products, ideas, and trends. Contact him at steve_fox@pcworld.com. Visit find.pcworld.com/31643 for more Plugged In.

NAGGING QUESTION

Why Is EBay Called EBay?

CONVENTIONAL wisdom has it that Pierre Omidyar, founder of the Web's preeminent auction site, named his creation after the San Francisco Bay Area. And you probably assumed that the *E* stands for *electronic,* as it does in the name of Omidyar's previous company, EShop. Guess again. In fact, back in 1995 the young programmer was heading to the trademark office to secure the name EchoBay, but when he arrived at the office, he learned that his first choice was taken. In a moment of clipped inspiration, EBay was born. But why EchoBay in the first place? "It had a nice sound to it."

ILLUSTRATION: ROBERT NEUBECKER

› Technology based on the assumption that everything you do is mission critical.

Compaq Evo D310v Microtower with 17" Monitor | **Small and Medium Business**

- Intel® Celeron® processor 1.70 GHz
  128MB PC2100 DDR SDRAM
  20GB Ultra ATA Hard Drive[*]
  48X Max CD-ROM Drive[†]
  Integrated Intel® Extreme 4X AGP Graphics
  Integrated Intel® Audio
  Integrated Intel® PRO 10/100 NIC
  Microsoft® Windows® XP Professional
  1-year Worldwide Limited Warranty[‡]
  S7500 17" Monitor (16" VIA)

$599

Lease for $19 a month[**]

For a limited time, make no payments for 90 days on purchases made before January 31, 2003.[††] Visit us at hp.com for additional, specially priced desktops and notebooks.

No payments for 3 months.

Every Compaq product is designed and built with business in mind. Legendary reliability and performance are standard. There's consistency across models, so your new Compaq is as familiar as your old Compaq to both user and system. And our seasoned service and support team has heard it all. Simply put, Compaq technology does its job so you can do yours.

Compaq PCs use genuine Microsoft® Windows® www.microsoft.com/piracy/howtotell

Prices shown are HP direct prices; reseller and retailer prices may vary. Prices shown are subject to change and do not include applicable state and local sales tax or shipping to recipient's destination. Photography may not accurately represent exact configurations priced. [*]For hard drives, GB=billion bytes. [†]48X Max CD-ROM Drive data transfer rates may vary from 6750 Kbps to 7800 Kbps. [‡]Certain restrictions and exclusions may apply. For complete warranty details, call 1-800-345-1518 (U.S.). [**]Lease products are available through Hewlett-Packard Financial Services Company (HPFSC) to qualified commercial customers in the U.S. and are subject to credit approval and execution of standard HPFSC documentation. Monthly lease payments are based on 48-month lease term with a fair-market-value, end-of-term option and do not include taxes, fees or shipping charges. Lessee has the option to purchase the equipment at the end of the lease term at its then fair market value (FMV). Customer may defer lease payments for three months from lease-start date, followed by 15, 21, 33 or 45 monthly payments on any lease with either fair market value, $1 or 10% end-of-lease, term-purchase option. Offer valid on all transactions less than $50,000 through January 31, 2003. HPFSC reserves the right to change or cancel this

Compaq Evo D310v Microtower

Small and Medium Business

- Intel® Celeron® processor 1.70 GHz
- 128MB PC2100 DDR SDRAM
- 20GB Ultra ATA Hard Drive*
- 48X Max CD-ROM Drive†
- Integrated Intel® Extreme 4X AGP Graphics
- Integrated Intel® Audio
- Integrated Intel® PRO 10/100 NIC
- Microsoft® Windows® XP Home
- 1-year Worldwide Limited Warranty‡

$449

Lease for $14 a month**

Compaq Evo D310 Microtower

Small and Medium Business

- Intel® Pentium® 4 processor 2 GHz
- 256MB PC2100 DDR SDRAM
- 40GB Ultra ATA Hard Drive*
- 48X Max CD-ROM Drive†
- Integrated Intel® Extreme 4X AGP Graphics
- Integrated AC97 Audio with premium internal speaker
- Integrated Intel® PRO 10/100 NIC
- Microsoft® Windows® XP Professional
- 1-year Worldwide Limited Warranty‡

$699

Lease for $21 a month**

Compaq Evo D510 Small Form Factor

Small and Medium Business

- Intel® Pentium® 4 processor 2 GHz
- 256MB PC2100 DDR SDRAM
- 20GB Ultra ATA Hard Drive*
- 48X Max CD-ROM Drive†
- Integrated Intel® Extreme Graphics 32MB
- Integrated AC97 audio with premium internal speaker
- Integrated Intel® PRO 10/100 NIC
- Microsoft® Windows® XP Home
- 3-year Worldwide Limited Warranty‡

$879

Lease for $27 a month**

Compaq Evo N1020v Notebook Bundle with Port Replicator & Carrying Case

Small and Medium Business

- Intel® Pentium® 4 processor 2 GHz
- 14.1" TFT XGA Display
- 256MB DDR SDRAM
- 30GB SMART Ultra ATA Hard Drive*
- DVD-ROM Drive
- ATI Radeon IGP 340M Integrated UMA 4X AGP Graphics with 32MB DDR SDRAM
- JBL Pro Speakers
- Integrated Mini PCI 56K V.92 Modem‡‡
- Integrated 10/100 NIC
- Microsoft® Windows® XP Professional
- 1-year Worldwide Limited Warranty‡
- Port Replicator & Carrying Case

$1399

Lease for $43 a month**

Compaq Evo N800v Notebook

Small and Medium Business

- Mobile Intel® Pentium® 4 Processor - M 1.80 GHz
- 15.0" TFT XGA Display
- 256MB DDR SDRAM
- 30GB SMART Ultra ATA Hard Drive*
- DVD-ROM Drive
- ATI Mobility Radeon 7500 4X AGP Graphics with 32MB DDR SDRAM
- JBL Pro Speakers
- Integrated Mini PCI 56K V.92 Modem‡‡
- Integrated 10/100 NIC
- Microsoft® Windows® XP Professional
- 1-year Worldwide Limited Warranty‡

$1549

Lease for $47 a month**

Compaq Evo N1020v Notebook

Small and Medium Business

- Intel® Pentium® 4 processor 2.40 GHz
- 15.0" TFT XGA Display
- 40GB SMART Ultra ATA Hard Drive*
- 256MB DDR SDRAM
- DVD/CD-RW Combo Drive
- ATI Radeon IGP 340M Integrated UMA 4X AGP Graphics with 32MB DDR SDRAM
- JBL Pro Speakers
- Integrated Mini PCI 56K V.92 Modem‡‡
- Integrated 10/100 NIC
- Microsoft® Windows® XP Professional
- 1-year Worldwide Limited Warranty‡

$1799

Lease for $55 a month**

Compaq Evo N610c Notebook

Small and Medium Business

- Mobile Intel® Pentium® 4 Processor - M 2 GHz
- 4.8 lbs and 1.2 inches thin
- 14.1" TFT XGA Display
- 256MB DDR SDRAM
- 30GB SMART Ultra ATA Hard Drive*
- DVD-ROM Drive
- ATI Mobility Radeon 7500 Graphics Controller with 32MB of DDR video RAM
- Compaq Premier Sound™ enhanced stereo audio system
- Integrated Mini PCI 56K V.92 Modem‡‡
- Integrated 10/100 NIC
- Microsoft® Windows® XP Professional
- 3-year Worldwide Limited Warranty‡

$1875

Lease for $57 a month**

hp tc2100 Server

Small and Medium Business

- Intel® Celeron® processor 1.20 GHz
- 256KB L2 cache
- 128MB registered ECC SDRAM
- Embedded, dual-channel 4/33/66/100 IDE controller
- 40GB ATA Hard Drive, upgradeable to 120GB*
- 1-year Limited Labor Warranty‡
- 3-year Parts Warranty‡

$649

Lease for $20 a month**

Buy now ›

1-888-811-9582

hp.com/go/pcworld

or call your local reseller

COMPAQ

hp invent

program at any time without notice. Some product restrictions may apply. Other fees and restrictions may apply. **Offer valid on direct purchases from the HP Small and Medium Business Store and only with purchase of select bundles. Offer available from 11/1/02 through 1/31/03 or while supplies last. Limited order quantities. Offer subject to change. Promotion void where prohibited or restricted by law. HP reserves the right to modify or withdraw this promotion at any time. ‡‡ITU V.90/V.92 modems are designed only to allow faster downloads from K56flex- or V.90/V.92-compliant digital sources. Maximum achievable download transmission rates are currently unknown, may not reach 56 Kbps and will vary with line conditions. © 2002 Hewlett-Packard Company. During the HP-Compaq product transitions, some HP iPAQ products and packaging may be labeled with the Compaq brand. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. Intel, the Intel Inside Logo, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Other products mentioned herein may be trademarks or registered trademarks of their respective companies.

MADE WITH NO
LIMITS IN MIND
9700
ALL-IN-WONDER® 9700 PRO

128 MB
ALL-IN-WONDER 9700 PRO

It's the ultimate light and sound show for your PC.
ALL-IN-WONDER® 9700 PRO gives you the ultimate home entertainment experience on your PC. Get industry best 3D graphics, time shifting TV tuner, video editing capabilities and radio frequency remote control matched with Direct X® 9.0 support for superior video realism in your 3D games. Plus, get incredibly crisp video during DVD and streaming video playback. Let the performance begin!

ATI.COM

Copyright 2002, ATI Technologies Inc.
All rights reserved. ATI and ALL-IN-WONDER are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or trademarks of their respective owners.

CONSUMER WATCH

ANNE KANDRA

A DOZEN COMPLAINTS, RANTS, AND GRIPES

PRIVACY WATCH: HACK-IN-A-BOX DANGERS

ON YOUR SIDE: SOUND CARD PROBLEMS

Twelve Ways Companies Drive Us Nuts

You know what's really maddening? These problems would be easy to fix.

100,000
HOURS FREE
FOR 30 DAYS
CLICK HERE
LOADING...
FREE!
TO 1,000 LBs
100,000

ILLUSTRATION: MARK MATCHO

PCs AND PERIPHERALS are speedier, flashier, and cheaper than ever, and the Web continues to grow and improve. Sadly, however, the development of customer service in the technology industry seems to be stuck in the slow lane. If companies would give their customers just a fraction of the attention they typically devote to transfer speeds and storage capacity, the resulting goodwill would have to improve their sales. But obviously, some businesses need help. So here are a few of my pet peeves, and some modest proposals for alleviating them.

Rebate? What rebate? It's a simple concept, really: You buy a product, maybe offer a few details about yourself, and the company sends you a little kickback just to say thanks. So how come so many companies can't seem to get it right? One reason is that rebate programs are almost always processed by third-party fulfillment houses that just don't seem to care whether you get your check on time—or at all, for that matter. My suggestion? How about ditching the archaic clip-and-snip, stamp-and-envelope approach in favor of an automated online system like the ones used to track packages? If we consumers could follow a documented electronic trail, we wouldn't have to waste time making copies and writing letters to prove that we followed the rules. And we'd be able to figure out exactly who to call if the check still doesn't arrive.

Upgrade the upgrades. In computer years, my PC is a senior citizen. In fact, I've been tempted for months now to let its aging processor retire to a simple life of visiting Disneyland.com with the kids. So why am I clinging to my trusty but tiring Pentium III? I dread the prospect of arduously reinstalling all my current applications, drivers, system settings, and customizations from scratch. So come on, guys: If you want to sell more PCs, come up with a safer, easier way to move all the stuff we love from our old machines.

AOL: Cut the spam. My regular Internet service provider offers a remarkably effective spam filter, so being pelted with ads for Viagra and low-interest mortgages isn't a day-to-day problem for me. But the next time I'm in the market for some unprescribed drugs or a debt-consolidation program, I know exactly where to turn: to America Online. I use my AOL account as a backup—for mail forwarding when I'm traveling, say, or when I need to give an e-mail address to someone who I never really want to hear from again. Then every week or so I muck out the mailbox, and by the time I'm done I feel like heading for a shower. I've spent some time trying to set up filters and controls, but it never seems to do much good. On its site, AOL (for whom *PC World* provides some ▶

UNDERSTAND me.

UNLEASH me.

UBER me.

content) claims to take a tough stand on spam. So how come it still allows so much of the junk to pass through its servers? We all know that times have been tough at AOL lately; maybe if the service cleaned up the spam, it would get more loyal users.

Hijacker ads. If anything could be more profoundly annoying than pop-up ads, it has to be their maniacal siblings, hostile-takeover ads. You know the type (you may even have seen one on PCWorld.com): They appear out of nowhere, careening loudly across your browser in the form of an animated racing car or a stunt aircraft, or they zap your screen repeatedly with a simulated lightning bolt. Then just as swiftly they disappear, leaving you wondering (a) what the hell that interruption was for, and (b) whether you have any legal recourse against the perpetrator. Maybe I'm too sensitive, but I don't think launching surprise attacks on unsuspecting users with obnoxious animated characters is the best way to win new customers. So to the companies that employ these loathsome tactics: Stop it. It only makes us hate you.

> To the companies that use these ads: Stop it. They only make us hate you.

You want RAM with that? Recently I wandered into a local electronics store to check out the latest PDAs. As I perused the gadgets, a salesperson who resembled Carrot Top on a bad hair day ambled over. "Those are cool, huh?" he grinned. "I have one of these myself. Sometimes I play tunes while I'm working." He went on to explain, in elaborate detail, the ins and outs of downloading and playing MP3 files on his Sony Clié, but when I asked him about the other applications that came bundled on the device, he gave me a blank stare. "Uh, I think it comes with some sort of spreadsheet thing, and some other stuff, too," he stammered, "but I don't really know much about it." Huge surprise. I understand that no salesperson can be an expert on everything, but it seems reasonable to expect them to be able to answer basic questions about the products they sell. After all, if they could, we might even be more likely to buy. And isn't that what stores want?

Flash and flashier. When I go online, I want information and I want it now. I don't want to waste time waiting...and waiting...and waiting...while the page loads hyperactive hyperlinks, gimmicky graphics, and tickertape text. Sure, I could adjust my browser's settings to eliminate these distractions, but why should I be forced to? Here's a plea to the legions of overly creative Web designer wannabes: Keep it simple! Do all of us poky dial-up users (and everyone else with eyes and ears) a favor—save the animated hula dancers and synthetic renditions of "Crocodile Rock" for your personal Web site and leave us out of it.

Take a bill, any bill. Every month I receive a whopping nine separate bills from six different companies for my various telecommunications services. Lest you suspect that I'm an obsessively wired propellerhead, those services consist of three telephone lines—one home, one office, and one dial-up Internet connection—plus long-distance service for two of them; two Internet accounts; a cell phone; and cable television. In many areas of the country, a single company may offer all of these services. But even then, such companies send separate bills. Now, I'm all for consumer choice and an open marketplace, but I have to admit that if one company offered to fulfill all my telecommunications needs and to send me a single, comprehensive bill that didn't require an advanced degree to decipher, I'd take a hard look at it. And I'll bet I'm not alone.

Software stowaways. You've just downloaded the latest version of your favorite Web browser, and now you're ready to start surfing. But wait a minute, what's this? A link to some financial service

ON YOUR SIDE

Discord Over Wrong Sound Card

I PURCHASED a Gateway PC that was supposed to have a SoundBlaster audio card. Instead, I received a system with sound integrated on the motherboard. I realized the discrepancy only when I received the invoice—weeks after I got the PC. After I talked to several Gateway reps, a manager offered me a $100 credit and proposed to send a technician to install the card and instruct me on how to disable my current sound configuration. I rejected the offer because I didn't want my system configured differently. Also, if a new card were installed, it would *not* be covered under the extended four-year service plan that I paid extra for. The card would be considered an added product and covered for only a year. Another rep offered to send me a new system with the correct components, but I'd have to pay $100 in shipping costs, which I didn't want to do. I shouldn't have to pay for the company's mistake.

Abby Frank, Jamaica, New York

***On Your Side* responds:** I contacted the company on Frank's behalf. Gateway spokesperson Ashley Wood says a rep contacted Frank again, offering her a $200 credit and on-site service to install the correct SoundBlaster card, or a complete refund. "We sold over a billion dollars' worth of computing products in the last quarter," says Wood. "We strive to build the perfect system. But when issues come up, we try to do everything to make customers happy." Frank accepted the $200 credit, but she declined to have Gateway install the correct SoundBlaster card.

When ordering online, it's a good idea to save the Web page or take a screen shot of the order confirmation page that lists all the items that you paid for. For orders placed over the phone, always ask the salesperson to send you a detailed invoice via e-mail or a hard copy via postal mail. And make sure you check the system itself as soon as you receive it.

—Grace Aquino

you've never heard of is now front and center on your system. And here's a logo for an unwanted telephone service in your Favorites folder. If you weren't careful, you might have a new chat client installed on your computer, too. Maybe some users out there really appreciate these corporate group-hugs, but I prefer to deal with one company—and one application—at a time. If I need other services, I know where to find them. So how about at least letting people opt out of the adfest?

Don't call us, we'll ignore you. Call me old-fashioned, but when I purchase something, I like to believe that at least one living, breathing, knowledgeable human being is behind the deal. That's why I'm constantly amazed at the number of online retailers that seem to be managed and operated with little or no human involvement whatsoever. You'll know that you're dealing with one of these companies if it takes more than ten clicks to find a telephone number—if you can find one at all. Another sign: Your e-mail messages either are ignored outright or trigger canned responses that have nothing to do with your question. Memo to the titans of e-commerce: Just because we shop online doesn't mean that we're antisocial or that we're capable of a warm and satisfying relationship with your servers. Hire a few human beings, and we'll be more likely to shop with you again.

No password? Get lost! Here's another thing that bugs me about online shopping: Why do so many Web sites force me to create a user name and password—in addition to surrendering all my credit card and shipping information—just to buy something? I have more than enough passwords to keep track of without creating a new one every time I want to make an impulse purchase. Isn't the purpose of e-commerce to make things easy for the folks with the credit cards? ▶

AMD me.

© 2002 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, AMD Athlon, and combinations thereof are trademarks of Advanced Micro Devices, Inc.

Clean up after yourself! If my mother taught me one thing, it's to be neat—especially when I'm a guest in someone else's home. Unfortunately, quite a few software developers never learned that lesson. I install and uninstall software all the time, and my Registry looks a lot like the floor underneath my refrigerator. No wonder my system is prone to random error messages and crashes. A utility like Norton CleanSweep does a pretty good job of excising the clutter, but here's a better idea: Software writers, don't leave a mess behind for someone else to clean up. If I say I want to uninstall your program, don't leave bits and pieces of code lying around where someone might trip over them. Clean it all up. And when you're finished, call your mother.

Save the world from spam. Okay, so this gripe isn't so much about companies, it's about us. Why do so many otherwise intelligent people seem to turn off all their discriminating faculties once they enter their in-box? Example 1: Those e-mail messages with the desperately important sounding headers that describe the technological apocalypse that will surely overwhelm your computer if you don't immediately delete certain files from your hard drive. Inevitably, of course, the "dangerous virus" turns out to be an essential Windows utility, and deleting it is like shooting yourself in the floppy drive. Example 2: The spam forwarded by well-meaning friends who plead for you to continue the chain so you can save a sick child or end deforestation in Bora Bora.

Unfortunately, most of these e-mail chains do little to help anyone, and many of them are outright ruses. Want to help the world? Before you click the forward button, double-check your facts. Visit find.pcworld.com/32126 to read information about virus hoaxes. And check out www.snopes.com to get the straight dope on other scams. A little knowledge could save all of us a lot of time. ■

Anne Kandra is a contributing editor, Grace Aquino an associate editor, and Andrew Brandt a senior associate editor for PC World. *E-mail them at consumerwatch@pcworld.com. For more* Consumer Watch, Privacy Watch, *or* On Your Side *columns, go to find.pcworld.com/31703, find.pcworld.com/31706, or find.pcworld.com/31709.*

PRIVACY WATCH

The Dangers of Do-It-Yourself Security

VULNERABILITY SCANNERS exist to tighten up your company's security. Essentially, these new software packages put hacking tools into a commercial wrapper so that administrators can use them to probe their own systems and look for holes that a bad guy could use to steal information or break into unsecured machines. But what if one of the administrators turns out to be a bad guy?

You guessed it—all your company's data is at risk, along with any personal data stored by or about you and your fellow employees on company systems.

These "hack-in-a-box" programs, like Network Associates' Cybercop Scanner and Bindview's Hacker Shield, were developed so that companies could get some peace of mind on the cheap. Traditionally, corporations concerned about their digital borders would hire security consultants, at a cost of tens of thousands of dollars, to engage in "penetration testing" of their networks. The process usually involved a number of security specialists attempting to discover all your network's vulnerabilities while your company's IT staff looked on. Even though these consultants had access to the most sensitive areas of your network, their actions were observed and logged carefully.

Vulnerability-testing software automates many of the tasks a security consultant would perform, allowing a company employee to test network security for a fraction of the cost of hiring an outsider. But along with the decreased cost can come decreased oversight. With access to vulnerability-testing software, just about any reasonably savvy IT administrator could be up and probing systems in almost no time—with or without someone else looking on.

That presents more of a risk to your company and fellow employees than you might guess. FBI crime statistics from 2001 show that nearly 40 percent of reported data theft cases are the result of company insiders stealing information.

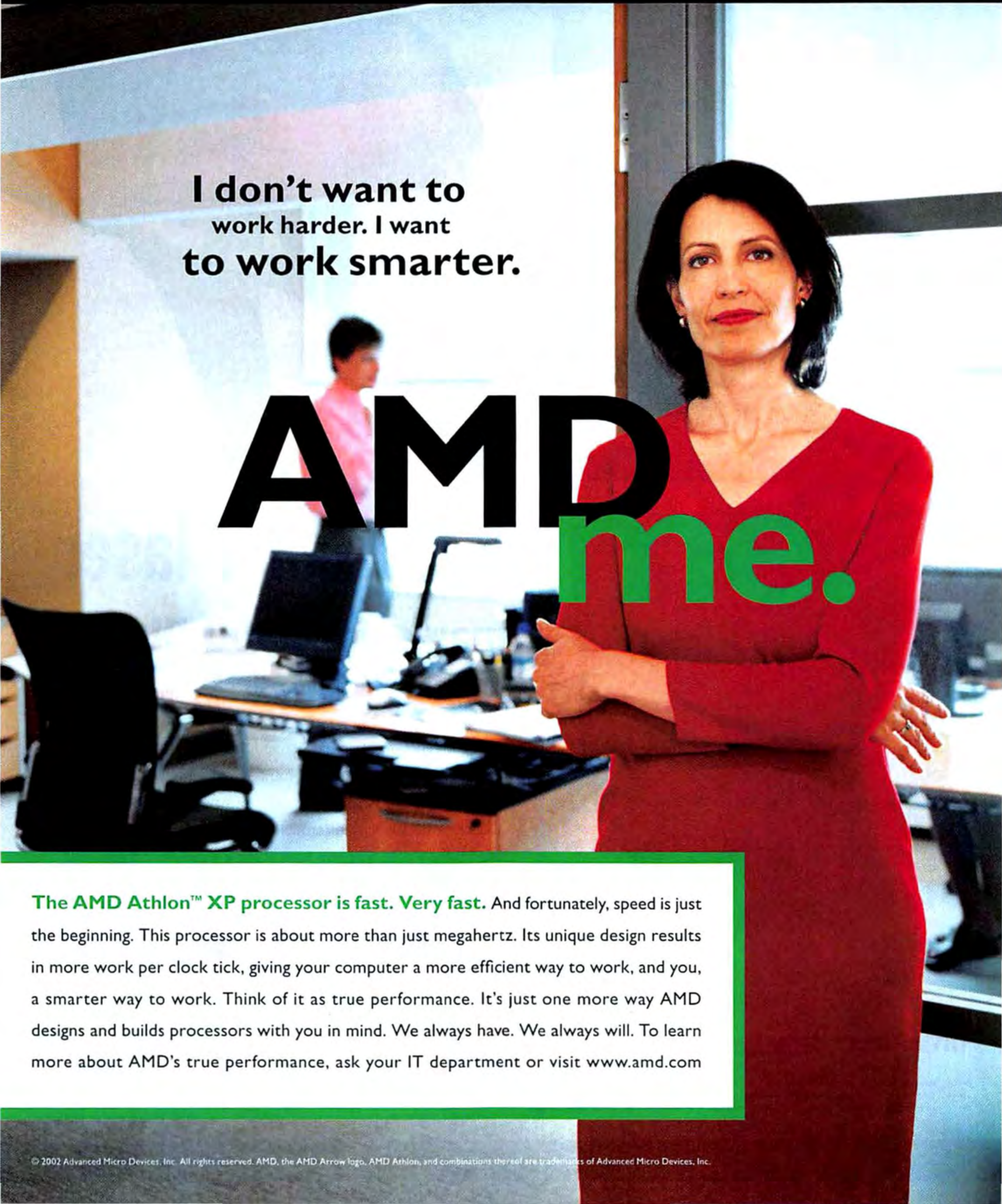
But, you might ask, don't people in my company's IT department already have unfettered access to the system? Not necessarily. Most IT staffers at many companies have only limited access to an employee's PC. If they need more access, companies usually have procedures to prevent unauthorized tampering with other people's computers.

Robert Wright, a computer security expert with the FBI's National Infrastructure Protection Center, says that software like these vulnerability scanners could make malicious insiders into better thieves who are harder to detect.

At a time when businesses are increasingly concerned with both security and cutting costs, it's clear that vulnerability scanners won't go away. And there's no reason that they should. But companies that use them must exercise responsible oversight. They should restrict access to the software to only those employees involved in penetration testing or security auditing, and the companies should have several layers of oversight for the staff that uses the software. In addition, IT managers must let everyone who uses the company network know about their use of vulnerability scanners, both before and after they run these programs.

—Andrew Brandt

ILLUSTRATION: MARK MATCHO


AMD
I don't want to work harder. I want to work smarter.
AMD me.

The AMD Athlon™ XP processor is fast. Very fast. And fortunately, speed is just the beginning. This processor is about more than just megahertz. Its unique design results in more work per clock tick, giving your computer a more efficient way to work, and you, a smarter way to work. Think of it as true performance. It's just one more way AMD designs and builds processors with you in mind. We always have. We always will. To learn more about AMD's true performance, ask your IT department or visit www.amd.com

© 2002 Advanced Micro Devices, Inc. All rights reserved. AMD, the AMD Arrow logo, AMD Athlon, and combinations thereof are trademarks of Advanced Micro Devices, Inc.

Great
color
comes in
small
packages

Minolta Co., Ltd., Osaka, Japan

$799 color laser

magicolor 2300 DL

The magicolor 2300 DL is a high-flying laser printer that's small in size and big in color. Included in its compact design is a combination of soaring speed, high-wire networking, and 2400 dpi quality—so even if you have to wing it, your prints will look brilliant! Powerful enough for workgroups, the magicolor 2300 DL is affordable enough for the home office user. Simply put...you can have it for a song—just **$799**. For more information call **800-523-2696.**

- 4 ppm color, 16 ppm b&w
- 2400 dpi
- 32 MB RAM
- Ethernet 10/100BaseTX, USB and Parallel interfaces included
- Windows XP/2000/NT 4/Me/98/95 compatible
- Optional automatic duplexing
- Up to legal size page support

MICROSOFT.
WINDOWS.
READY-TO-RUN

OfficeMax COMPUSA THE COMPUTER SUPERSTORE Office DEPOT STAPLES

MINOLTA
QMS

The essentials of imaging

© 2002 MINOLTA-QMS, Inc. The MINOLTA-QMS logo and magicolor are trademarks or a registered trademarks of MINOLTA-QMS, Inc. All other trademarks or registered trademarks are the property of their respective owners.
*Estimated street price. Dealer prices may vary. **Images provided by kind courtesy of digitalvisiononline.com.**

www.minolta-qms.com

HOME OFFICE

STEVE BASS

PC Upgrades Are Now an Outside Job

Version 2.0 makes USB a great choice for easy hardware enhancements.

THERE'S MORE TO USB than easy printer, scanner, mouse, and keyboard hookups. How about upgrading the sound, hard drive, or optical drive on your PC without having to crack your PC's case and poke around its insides?

I always seem to need more storage, but I can't add another hard drive to my PC because it doesn't have any free bays. My workaround? An external USB adapter—a shell, really—that lets me connect a hard drive, CD-RW or DVD drive, or any other IDE device to my PC.

The $65 USB 2.0 Drive Kit from ADS Technologies has its own AC power plug, on/off switch, and USB cable. Add $80 for a cheap 80GB hard drive I found on PCWorld.com's Product Finder, and I've got a super and affordable way to add storage. The setup also provides the security and portability I need for backups. The kit is plug-and-play and hot-swappable—I just use the Add/Remove Hardware applet in Windows' Control Panel to unplug the device and remove the USB cable. No need to take the hard drive out of the Drive Kit shell.

You saw the catch, right? Unless you bought your PC recently, it probably doesn't support USB 2.0. To get the drive's fastest performance, you need to, uh, open the PC's case to install a USB 2.0 adapter. USB 1.1 reaches transmission speeds of 12 megabits per second, while USB 2.0 leaps to 480 mbps. For more on USB 2.0 (there's a big difference between the specs and the real-world throughput), read "Upgrades: Right on the Money" at find.pcworld.com/31592.

Sound Blaster Extigy
★★★★☆
$100
Creative Labs
www.creative.com

USB 2.0 Drive Kit
★★★★½
$65
ADS Technologies

USB Instant DVD
★★★★½
$150
ADS Technologies
www.adstech.com

I added USB 2.0 to my old computer via Adaptec's $74 DuoConnect PCI card, which has four USB 2.0 ports and three FireWire ports. It took about an hour and several reboots to install the card on my Windows 98 SE system, but only 10 minutes to install on a Windows XP machine.

LISTEN UP

I GAVE THE AX to the cheapo sound card that came with my wife Judy's PC (it probably cost the vendor all of $3). I replaced it with Creative's $100 Sound Blaster Extigy, which looks like a small stereo amplifier. I connected the Extigy to the PC's USB port, installed the drivers, rebooted, and was done. The Extigy automatically told the existing sound card that it was no longer the PC's audio device—I didn't need to manually disable anything.

The 5-minute Extigy upgrade gave the computer better sound *and* the audio ports Judy needs to plug in both a cassette recorder and headphones so she can listen to bird calls. I used the device to plug in a set of 5.1 speakers and to tickle the keys of a MIDI piano keyboard. The Extigy has optical, Sony/Philips Digital Interface (SPDIF), and digital connectors, as well as convenient line-in, microphone, and headphone ports, all in easy reach.

Speaking of reach, I soon got tired of crawling under my desk with a flashlight in my mouth every time I needed to swap USB devices. Now I plug them all into a USB hub—Belkin's 7-Port Hub ($26) fits the bill nicely.

Lately I've been spending a lot of time futzing with a digital camcorder as I edit tons of digital and older analog video. I've been using ADS Technologies' $150 USB Instant DVD external video capture unit. It imports from practically any source: a VCR, analog video recorder, digital camcorder (via an analog connector), or even a TiVo. Even though I could hook up my digital camera using FireWire, it's faster with the USB Instant DVD because the gizmo uses a hardware compression chip to recompress the digital video format into MPEG. The device is bundled with Ulead's VideoStudio and MyDVD software, apps that make it easy to fiddle with old videotapes and burn them onto CDs.

The downside to these external internals? I definitely need a bigger desk. ■

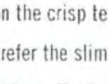
Contributing Editor Steve Bass runs the Pasadena IBM Users Group. Reach him at homeoffice@pcworld.com; visit find.pcworld.com/31610 for more Home Office *columns.*

ILLUSTRATION: CHRISTOPH NIEMAN

SONY.

THE PROFESSIONAL EDGE

Professionals from all walks of life rely on Sony displays for their livelihood. Designers depend on the amazing image detail and rich color reproduction. Business owners rely on the crisp text and wide viewing angles of Sony Flat Panel LCDs. Financial analysts and traders prefer the slim bezel and easy wall or arm mounting options for multi-screen large viewing applications. Professors and students count on the legendary picture quality of Sony's Emmy®-winning* FD Trinitron® CRT displays. What do all of these professionals have in common? A need for top quality, reliability, performance and value. With a wide selection of sizes and features, Sony has the ideal display for you and your business – from the hard-working StylePro™ Series to the powerful DeluxePro™ Series to the highly specialized PremierPro™ Series. See for yourself. To find the ideal display to match your business needs, see "How to Choose a Display" at www.sony.com/idealdisplay.



GET THE PROFESSIONAL EDGE.
VISIT WWW.SONY.COM/IDEALDISPLAY OR CONTACT YOUR PREFERRED SOLUTION PROVIDER.

VISUAL INNOVATION. CLEARLY SONY. **WWW.SONY.COM/IDEALDISPLAY**

STYLEPRO™ | DELUXEPRO™ | PREMIERPRO™

©2002 Sony Electronics Inc. All rights reserved. Reproduction in whole or in part without written permission is prohibited. Sony, the Sony logo, StylePro, DeluxePro, PremierPro and Trinitron are trademarks of Sony. All other trademarks are properties of their respective owners. *A 2001 Emmy® award for Technical Achievement in Flat Screen CRT Technology was awarded to Sony by the National Academy of Television Arts and Sciences (NATAS).

BUGS & FIXES

STUART J. JOHNSTON

Grief With Microsoft Software, Hardware

Fix the latest problems with Windows, Office, and the new networking devices.

YOU HAVE TO give Microsoft credit some of the time. Sure, the majority of us feel frustrated by the bugs in many of its products. But at least the company is serious about fixing problems—especially if users cry loudly enough.

For instance, last time I wrote about a security hole in Windows XP's online help tool (go to find.pcworld.com/31868 for details). As I reported, Microsoft plugged the hole and included the fix with Service Pack 1 for Windows XP. At that time, the company said it would not release a separate patch. Since then, however, it has reversed that position and released an individual fix. Go to find.pcworld.com/31871 for a link to the patch.

Also last month (see find.pcworld.com/31874), Microsoft insisted that a vulnerability in Word 97, 2000, and 2002 was really a feature. The problem? A miscreant could steal files off your hard drive. The company responded by posting some general advice on how to protect your documents. But a few weeks later, Microsoft changed its mind and released a set of patches to fix the Word hole, as well as a related one in Excel 2002. Visit find.pcworld.com/31877 for a link to the downloads.

Microsoft has fessed up to hardware problems, too: The company recently acknowledged connection glitches with its new networking units. Owners of Microsoft's MN-500 broadband wireless base station and MN-100 wired Ethernet router have experienced dropped connections and error messages. Some users reported that their connections would go down as often as every half hour.

Microsoft released a firmware patch that applies to both devices. Hop to find.pcworld.com/31889 to grab the download. If you use the Auto Update service, you should already have been notified about the fix (go to find.pcworld.com/32138 to learn how to set up Auto Update). Lastly, visit find.pcworld.com/31886 for Microsoft's general tips on how to improve your wireless performance. ■

Stuart J. Johnston is a contributing editor for PC World. *Visit find.pcworld.com/31580 to see more* Bugs and Fixes *columns.*

BUG EXTERMINATOR

Outlook 2002 Troubles

MY WINDOWS XP system was only three months old when I first ran into a major problem with Outlook 2002. It happened right after I installed Service Pack 2 for Office XP. I couldn't use Outlook anymore without the program crashing. I uninstalled the service pack, but that didn't help; I also followed some newsgroup recommendations, but those suggestions didn't help either. I contacted Microsoft, and they wanted me to pay a fee for support.

Scott Malat, New York

***Bugs and Fixes* responds:** I contacted Microsoft on Malat's behalf. A company tech e-mailed Malat a link to a patch, and the problem went away.

If you are experiencing the same problem and know how to use the Internet File Transfer Protocol, you can retrieve the patch at ftppss.Microsoft.com. The folder name is *Mail* and the file name is Q329427.zip. Alternatively, you can request the fix by contacting compmail@microsoft.com. Microsoft has yet to add the patch to its updates library.

IN BRIEF

Toshiba PDA Recall

SOME TOSHIBA Pocket PC E740 devices are losing data when their batteries die. The serial numbers of affected units range from 72014641L through 92041620L. Visit find.pcworld.com/31892 to read a PDF file on the manufacturer's repair procedure.

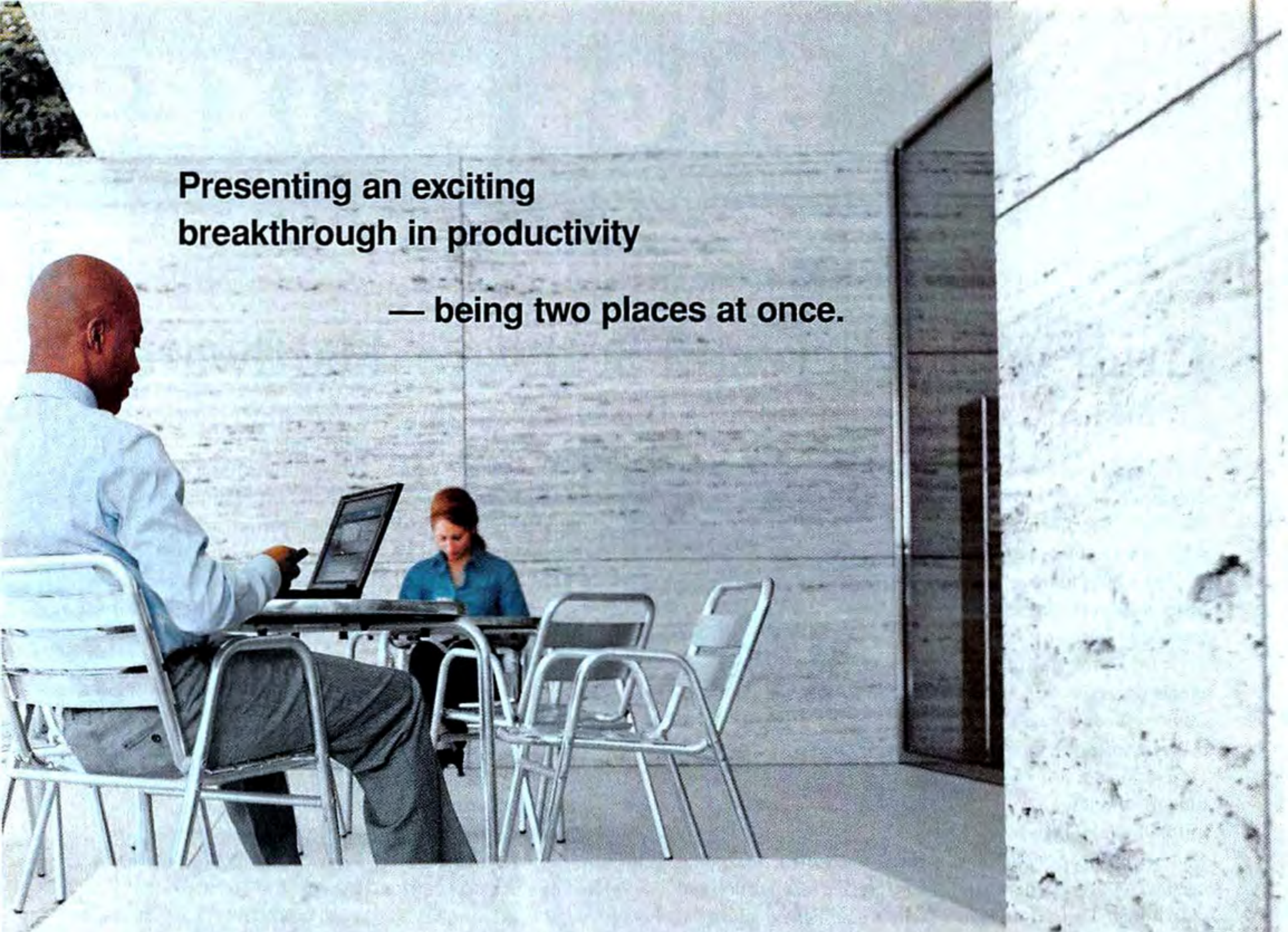
Oh, Brother!

BROTHER IS recalling some of its older multifunction devices and laser printers because the fuser can create a fire hazard. The models affected are HL-1040, HL-1050, HL-1060, and MFC-P2000. If you bought one of these units between 1997 and 2000, return it to your authorized service center for a fuser replacement (see find.pcworld.com/31895).

BUGGED?

FOUND A hardware or software bug? Tell us about it via e-mail at bugs@pcworld.com.

ILLUSTRATION: TAVIS COBURN



Presenting an exciting breakthrough in productivity

— being two places at once.

Exceptional performance. Greater efficiency. Increased freedom with Secure Wireless Solutions from IBM.

A conference room. Another floor. Even the lobby. Secure Wireless Solutions give you the connectivity you need to move freely throughout your wireless-enabled office building. That's because select ThinkPad® notebooks come with features like built-in dual-antenna systems for enhanced signal strength.[4] Integrated Cisco® Aironet® Wireless technology (on select models) gives IT managers the confidence that comes with having a secure wireless solution. For even greater security, there's the TCPA-compliant IBM Embedded Security Subsystem 2.0 on select models. And with the agility and mobility of the Mobile Intel® Pentium® 4 Processor - M (on select models), you won't just enjoy increased peace of mind. You'll enjoy exceptional performance, too. Secure Wireless Solutions from IBM. Who says you can't be two places at once?

IBM ThinkPad T30
(#236685U)

See reverse side for warranty information.

Best blend of ThinkPad portability and essential features

IBM ThinkPad R31

Distinctive Features:

- ThinkLight keyboard light for low-light conditions
- IBM Rapid Restore™ PC — Unique managed data-recovery solution (downloadable)

System Specifications:

- Mobile Intel® Celeron® processor 1.20GHz
- 13.3" XGA TFT display • Integrated Intel® graphics
- 128MB SDRAM • 20GB hard drive
- Ultrabay™ Plus CD-ROM
- Integrated Ethernet and modem
- Microsoft® Windows® XP Home Edition
- Lotus® SmartSuite® Millennium license • PC Doctor
- 2.6-hr Li-Ion battery • 5.4-lb travel weight
- 1-yr system/battery limited warranty

$999* NavCode™ 2656L1U-M477

With Microsoft® Office XP Small Business $1,099

Customize Yours:
ThinkPad R31 Li-Ion Battery (#02K6821) $139

ServicePac® Service Upgrade
3-yr onsite/9x5/
Next Business Day Response (#30L9195) $243

Extra-light, extra-small, ultraportable

IBM ThinkPad X30

Distinctive Features:

- Titanium Composite top cover for added strength
- Exceptional battery life — Up to 4.6 hrs with system battery; up to 8.1 hrs with optional extended life battery and system battery
- FireWire (IEEE 1394) port and Compact Flash slot for added connectivity and expansion
- IBM Embedded Security Subsystem 2.0 (requires download of security software)

System Specifications:

- Mobile Intel® Pentium® III Processor 1.06GHz - M supports Enhanced Intel SpeedStep® technology
- 12.1" XGA TFT display
- 128MB SDRAM • 20GB hard drive
- Integrated Ethernet and modem
- Integrated Wi-Fi™ wireless
- Microsoft® Windows® XP Professional
- 3.6-lb travel weight • 4.6-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty

$2,129 NavCode™ 26721BU-M477

With Microsoft® Office XP Small Business $2,229

Customize Yours:
ThinkPad X30 Extended Life Battery (#02K7041) $189

ServicePac® Service Upgrade
4-yr onsite/9x5/
Next Business Day Response (#69P9198) $299

High-performance, versatile desktop alternative

IBM ThinkPad A31

Distinctive Features:

- Two swappable bays provide maximum expandability
- Web navigation keys — Unique shortcut keys replicate favorite browser functions

System Specifications:

- Mobile Intel® Pentium® 4 Processor 1.60GHz - M supports Enhanced Intel® SpeedStep® technology
- 14.1" XGA TFT display
- 16MB ATI Mobility Radeon 7500 graphics
- 128MB DDR SDRAM • 20GB hard drive
- Ultrabay 2000 CD-ROM
- Microsoft® Windows® 2000 Professional
- 2.5-hr Li-Ion battery • 6.8-lb travel weight
- 1-yr system/battery limited warranty

$1,499 NavCode™ 2652J4U-M477

With Microsoft® Office XP Small Business $1,599

Customize Yours:
IBM 128MB PC2100 SDRAM Upgrade (#10K0028) $51

ServicePac® Service Upgrade
4-yr onsite/9x5/
Next Business Day Response (#69P9194) $399

Perfect balance of performance and portability

IBM ThinkPad T30

Distinctive Features:

- UltraNav™ — Convenient touch pad/full-function TrackPoint® combination
- IBM Embedded Security Subsystem 2.0GHz (requires download of security software)
- Titanium Composite top and bottom covers for added strength

System Specifications:

- Mobile Intel® Pentium® 4 Processor 1.80GHz - M supports Enhanced Intel SpeedStep® technology
- 14.1" XGA TFT display
- 256MB DDR SDRAM • 40GB hard drive
- Ultrabay Plus DVD-ROM
- Integrated Wi-Fi wireless
- Microsoft® Windows® XP Professional
- 2.5-hr Li-Ion battery • 5.0-lb travel weight
- 3-yr system/1-yr battery limited warranty

$2,279 NavCode™ 236685U-M477

With Microsoft® Office XP Small Business $2,379

Customize Yours:
ThinkPad Docking Station (#263120U) $529

ServicePac® Service Upgrade
5-yr onsite/9x5/
Next Business Day Response (#69P9200) $449

IBM

IBM makes wireless easy

IBM Access Connections software simplifies management of multiple connectivity environments. By saving the settings for your wired and wireless connections (if applicable), it makes switching between them easy.

IBM Wireless Networking Options

High Rate Wireless Access Point 500	(#09N9906)	$449
High Rate Wireless LAN PC Card 128	(#09N9904)	$99

ThinkPad Notebook Accessories

ThinkPad Nylon Carrying Case[13]	(#10K0207)	$49
72W AC Adapter	(#02K6699)	$55
IBM USB Serial Parallel Adapter	(#22P5298)	$69
ThinkPad Premiere Leather Carrying Case[9]	(#10K0209)	$99
128MB USB Memory Key	(#22P8998)	$129
Lexmark Z55se Color Jetprinter	(#22P8662)	$129.99
Targus DEFCON Authenticator PC Card Fingerprint Reader	(#31P6763)	$174.99
ThinkPad Port Replicator	(#02K8667)	$179
UltraBase™ X3 media slice (expansion/device bay for ThinkPad X30)	(#46P7912)	$199
ThinkPad CD-RW/DVD Combo III Ultrabay 2000 Drive	(#22P6980)	$299

Upgrade your system with Microsoft® Office XP Small Business to Microsoft® Office XP Professional with Publisher for only $169 more.

Call **1 866 426-7004** or go to **ibm.com**/shop/m477

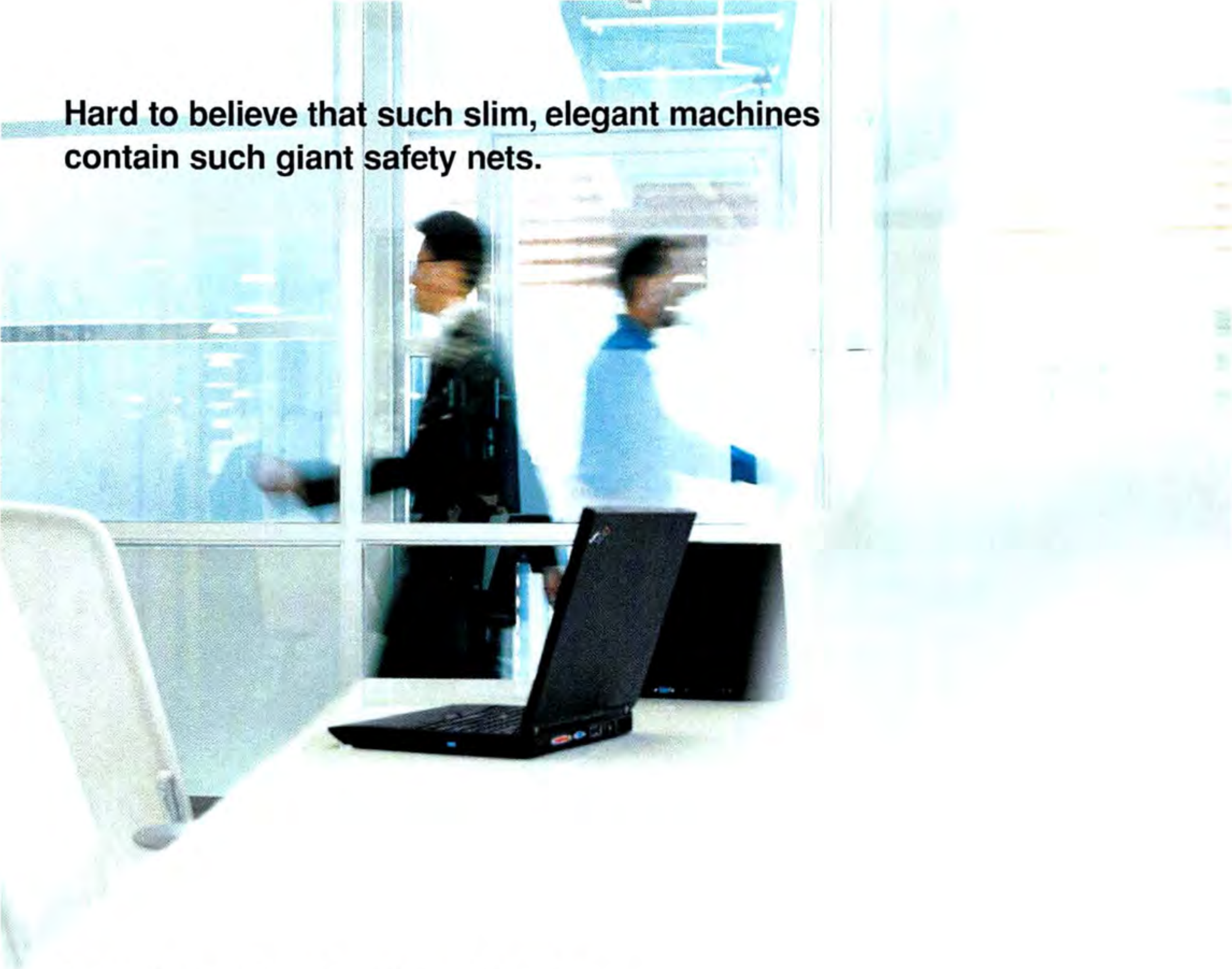
to buy direct, locate an IBM reseller or for more information.

NavCode™ Get the latest pricing and information fast. Use NavCode on the phone or on the Web.

Look for this symbol to quickly find wireless-enabled IBM systems.

IBM recommends Microsoft® Windows® XP Professional for Business.

Warranty Information For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept. JDJA/B203. IBM makes no representation or warranty regarding third-party products or services. *Prices do not include tax or shipping and are subject to change without notice. Reseller prices may vary. Available for download through Access IBM. For ThinkPad R30, R31 and X30 models, memory supports both system and video. Accessible system memory may be up to 32MB less than the amount stated depending on video mode. GB = 1,000,000,000 bytes when referring to storage capacity; accessible capacity is less. Some software may differ from its retail version (if available) and may not include user manuals or all program functionality. Software license agreements may apply. Includes battery and optional travel bezel instead of standard optical drive in Ultrabay bay, if applicable; weight may vary due to vendor components, manufacturing process and options. Thinness may vary at certain points on the system. Telephone support may be subject to additional charges. For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician. Certain Microsoft software product(s) included with this computer may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software product(s) or reconfigurations of the computer and may be completed by Internet or telephone (toll charges may apply). These model numbers achieved eTesting Labs Inc's BatteryMark 4.01 Battery Rundown Time of at least the times shown above. This test was performed without independent verification by eTesting Labs, Inc., eTesting Labs, Inc., makes no representations or warranties as to these test results. BatteryMark is a trademark of Ziff Davis Publishing Holdings, Inc., an affiliate of eTesting Labs, Inc., in the U.S. and other countries. A description of the environment under which the test was performed is available at ibm.com/pc/ww/thinkpad/batterylife.html. These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For noncritical service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. External peripherals, such as racks, tape drives and channel controllers, require their own, separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. With Intel SpeedStep, processor speed may be reduced to conserve battery power. Requires Internet access account, not included. Based on IEEE 802.11b. This wireless LAN product has been designed to permit legal operation worldwide in regions in which it is approved. Operation on channels 12-14 is not permitted in all regulatory regions of the world. Consequently, the wireless LAN feature is limited to operate on channels 1-11 and will not support channels 12, 13 and 14. This product has been tested and certified to be interoperable by the Wireless Ethernet Compatibility Alliance and is authorized to carry the Wi-Fi logo. IBM does not manufacture, warrant or support this product; IBM logos and trademarks used under license. Contact IBM for details. *Requires compatible wireless-enabled option sold separately. ThinkPad R Series with wireless have antenna in side and base of display. All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM Company. Intel, the Intel Inside logo, Celeron and Pentium are registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. ©2002 IBM Corp. All rights reserved.



Hard to believe that such slim, elegant machines contain such giant safety nets.

Increase your uptime and your peace of mind with IBM Rapid Restore™ PC.

IBM Rapid Restore PC is helping businesses work smarter. It's the downloadable, automatic backup and recovery system for your data. IBM Rapid Restore PC Software is available on IBM PCs and can back up your applications and operating systems. So if your software ever becomes corrupted, a simple push of a button launches the restoration program. This way, your previously saved files are rescued and restored, reducing your downtime, and increasing your peace of mind. IBM Rapid Restore PC. Both you and your data may be lost without it.

IBM ThinkPad R32

See reverse side for warranty information.

Best blend of ThinkPad® portability and essential features

IBM ThinkPad R32

Distinctive Features:

- Ultrabay™ Plus — Supports a second battery for expanded productivity
- IBM Rapid Restore PC — Unique managed data-recovery solution (downloadable)

System Specifications:

- Mobile Intel® Pentium® 4 Processor 1.80GHz - M supports Enhanced Intel SpeedStep® technology[10]
- 14.1" XGA TFT display
- 16MB ATI Mobility Radeon 7000 graphics
- 256MB DDR SDRAM • 20GB hard drive[3]
- Ultrabay Plus DVD-ROM
- Integrated Ethernet and modem
- Microsoft® Windows® XP Professional[4]
- Lotus® SmartSuite® Millennium license • PC Doctor
- 3.3-hr Li-Ion battery[8] • 5.6-lb travel weight[5]
- 1-yr system/battery limited warranty[6]

$1,499* ▶ **NavCode™** 2658J3U-M477

With Microsoft® Office XP Small Business[1]		$1,599
Customize Yours: ThinkPad R32 Li-Ion Battery	(#02K7052)	$139
ServicePac® Service Upgrade[9] 4-yr Depot Repair	(#69P9195)	$249

High-performance, versatile desktop alternative

IBM ThinkPad A31

Distinctive Features:

- Two swappable bays provide maximum expandability
- IBM Embedded Security Subsystem 2.0 (requires download of security software)

System Specifications:

- Mobile Intel® Pentium® 4 Processor 1.90GHz - M supports Enhanced Intel SpeedStep® technology
- 15" XGA TFT display
- 16MB ATI Mobility Radeon 7500 graphics
- 256MB DDR SDRAM • 30GB hard drive
- Ultrabay 2000 DVD-ROM
- Microsoft® Windows® XP Professional
- W Integrated Wi-Fi™ wireless[11]
- 2.5-hr Li-Ion battery • 7.0-lb travel weight
- 1-yr system/battery limited warranty[6]

$1,949 ▶ **NavCode™** 2652P3U-M477

With Microsoft® Office XP Small Business		$2,049
Customize Yours: IBM 128MB PC2100 SDRAM Upgrade	(#10K0028)	$51
ServicePac® Service Upgrade 5-yr onsite/9x5/ Next Business Day Response	(#69P9196)	$549

Extra-light, extra-small, ultraportable

NEW! IBM ThinkPad X30

Distinctive Features:

- Titanium Composite top cover for added strength
- Exceptional battery life — Up to 5.0 hrs with system battery; up to 8.9 hrs with optional extended life battery and system battery
- FireWire (IEEE 1394) port and Compact Flash slot for added connectivity and expansion
- IBM Rapid Restore PC — Unique managed data-recovery solution (downloadable)

System Specifications:

- Mobile Intel® Pentium® III Processor 1.20GHz - M supports Enhanced Intel SpeedStep® technology
- 12.1" XGA TFT display
- 256MB SDRAM[2] • 40GB hard drive
- Integrated Ethernet and modem
- Microsoft® Windows® XP Professional
- 3.6-lb travel weight • 5.0-hr Li-Ion battery
- 3-yr system/1-yr battery limited warranty[6]

$2,449 ▶ **NavCode™** 267242U-M477

With Microsoft® Office XP Small Business		$2,549
Customize Yours: ThinkPad X30 Li-Ion Battery	(#02K7039)	$169
ServicePac® Service Upgrade 5-yr Depot Repair	(#69P9201)	$220

Perfect balance of performance and portability

NEW! IBM ThinkPad T30

Distinctive Features:

- UltraNav™ — Convenient touch pad/full-function TrackPoint® combination
- IBM Embedded Security Subsystem 2.0 (requires download of security software)
- Titanium Composite top and bottom covers for added strength

System Specifications:

- Mobile Intel® Pentium® 4 Processor 2.0GHz - M supports Enhanced Intel SpeedStep® technology
- 14.1" SXGA+ TFT display
- 256MB DDR SDRAM • 60GB hard drive
- Ultrabay Plus CD-RW/DVD-ROM/Combo drive
- W Integrated Wi-Fi wireless[11]
- Integrated Bluetooth™
- Microsoft® Windows® XP Professional
- 2.5-hr Li-Ion battery • 5.1-lb travel weight
- 3-yr system/1-yr battery limited warranty[6]

$2,699 ▶ **NavCode™** 236697U-M477

With Microsoft® Office XP Small Business		$2,799
Customize Yours: ThinkPad T30 Series Li-Ion Battery	(#02K7050)	$189
ServicePac® Service Upgrade 4-yr onsite/9x5/ Next Business Day Response	(#69P9198)	$299

IBM®

IBM makes wireless easy

IBM Access Connections software simplifies management of multiple connectivity environments. By saving the settings for your wired and wireless connections (if applicable), it makes switching between them easy.

IBM Wireless Networking Options

High Rate Wireless LAN Mini PCI Adapter	(#22P7701)	$169
High Rate Wireless Access Point 500	(#09N9906)	$449
High Rate Wireless LAN PC Card 128	(#09N9904)	$99

ThinkPad Notebook Accessories

ThinkPad Nylon Carrying Case[12]	(#10K0207)	$49
72W AC Adapter	(#02K6699)	$55
IBM USB Serial Parallel Adapter	(#22P5298)	$69
HP DeskJet 3420 Color Printer	(#31P7690)	$89.99
ThinkPad Premiere Leather Carrying Case[12]	(#10K0209)	$99
128MB USB Memory Key	(#22P8998)	$139
Targus DEFCON Authenticator PC Card Fingerprint Reader	(#31P6763)	$174.99
ThinkPad Port Replicator	(#02K8667)	$179
UltraBase™ X3 media slice (expansion/device bay for ThinkPad X30)	(#46P7912)	$199
ThinkPad CD-RW/DVD Combo III Ultrabay 2000 Drive	(#22P6980)	$299

Upgrade your system with Microsoft® Office XP Small Business to Microsoft® Office XP Professional with Publisher for only $169 more.

W ***Look for this symbol to quickly find wireless-enabled IBM systems.***

Call **1 866 426-7004** or go to **ibm.com**/shop/m477

to buy direct, locate an IBM reseller or for more information.

▶ **NavCode™** Get the latest pricing and information fast. Use NavCode on the phone or on the Web.

IBM recommends Microsoft® Windows® XP Professional for Business.

Warranty Information: For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709 Attn: Dept. JDJA/B203. IBM makes no representation or warranty regarding third-party products or services. *Prices do not include tax or shipping and are subject to change without notice. Reseller prices may vary. [1]Available for download through Access IBM. [2]For ThinkPad R30, R31 and X30 models, memory supports both system and video. Accessible system memory may be up to 32MB less than the amount stated, depending on video mode. [3]GB = 1,000,000,000 bytes when referring to storage capacity; accessible capacity is less. [4]Some software may differ from its retail version (if available) and may not include user manuals or all program functionality. Software license agreements may apply. [5]Includes battery and optional travel bezel instead of standard optical drive in Ultrabay bay, if applicable; weight may vary due to vendor components, manufacturing process and options. Thinness may vary at certain points on the system. [6]Telephone support may be subject to additional charges. For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician. [7]Certain Microsoft software product(s) included with this computer may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software product(s) or reconfigurations of the computer, and may be completed by Internet or telephone (toll charges may apply). [8]These model numbers achieved eTesting Labs, Inc.'s BatteryMark 4.01 Battery Rundown Time of at least the times shown above. This test was performed without independent verification by eTesting Labs, Inc.; eTesting Labs, Inc., makes no representations or warranties as to these test results. BatteryMark is a trademark of Ziff Davis Publishing Holdings, Inc., an affiliate of eTesting Labs, Inc., in the U.S. and other countries. A description of the environment under which the test was performed is available at *ibm.com/pc/ww/thinkpad/batterylife.html* [9]These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For noncritical service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. External peripherals, such as racks, tape drives and channel controllers, require their own, separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. [10]With Intel SpeedStep, processor speed may be reduced to conserve battery power. [11]Based on IEEE 802.11b. This wireless LAN product has been designed to permit legal operation worldwide in regions in which it is approved. Operation on channels 12-14 is not permitted in all regulatory regions of the world. Consequently, the wireless LAN feature is limited to operate on channels 1-11 and will not support channels 12, 13 and 14. This product has been tested and certified to be interoperable by the Wireless Ethernet Compatibility Alliance and is authorized to carry the Wi-Fi logo. [12]IBM does not manufacture, warrant or support this product; IBM logos and trademarks used under license. Contact IBM for details. All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM Company. Intel, the Intel Inside logo, Celeron and Pentium are registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. ©2002 IBM Corp. All rights reserved.

The next best thing to PCs that say,
"Halt, who goes there?"
(Monitor sold separately)

End-to-end IBM security features and options are designed to help keep everyone at bay. Except you.

When you buy select IBM NetVista™ desktops, you can take advantage of a range of innovative security features designed for your peace of mind. And intruders' frustration. Features like the TCPA-compliant IBM Embedded Security Chip. Another way we give you greater peace of mind is with Access Support (available by download), designed to solve common PC problems quickly. For even greater security, you can take advantage of options like ID readers. Factor in the speed and performance of the Intel® Pentium® 4 processor (on select models), and you can get a secure powerhouse that can help you work more confidently and productively. Not to mention more privately.

intel inside pentium 4

IBM NetVista M42
(shown with optional
flat panel monitor)

See reverse side for warranty information.

Stability and manageability for your business

NEW! IBM NetVista M42

Distinctive Features:

- IBM Embedded Security Subsystem

System Specifications:

- Intel® Pentium® 4 processor 1.80GHz
- 256MB DDR SDRAM[2] • 40GB[3] hard drive
- Integrated 10/100 Ethernet • CD-ROM
- Intel Extreme® Graphics
- Microsoft® Windows® XP Professional[4]
- 3-yr parts and onsite labor limited warranty[5]

$969* NavCode™ 830554U-M477

With Microsoft® Office XP Small Business[6]		$1,069
Customize Yours: 17" TFT Flat Panel Monitor with system purchase	(#W9B710B)	$589
ServicePac® Service Upgrade[7] 4-yr onsite/9x5/ Next Business Day Response	(#69P9161)	$89

Innovative technology and competitive prices

IBM NetVista A30

Distinctive Features:

- IBM Rapid Restore™ PC — Unique managed data-recovery solution (downloadable)

System Specifications:

- Intel® Pentium® 4 processor 1.80GHz
- 128MB DDR SDRAM[2] • 40GB hard drive
- Modem and Integrated Ethernet • CD-ROM
- Intel Extreme® Graphics
- Microsoft® Windows® XP Home Edition
- 1-yr parts and onsite labor limited warranty[5]

$599 NavCode™ 831161U-M477

With Microsoft® Office XP Small Business		$699
Customize Yours: 15" TFT Flat Panel Monitor with system purchase	(#15TFTB1)	add $399
ServicePac® Service Upgrade 3-yr onsite/9x5/ Next Business Day Response	(#54P1861)	$132

Smallest NetVista desktop without compromise

IBM NetVista S42

Distinctive Features:

- Uses up to 64% less space than traditional IBM desktop chassis
- Access Support — Downloadable automated solution to help resolve common computer problems

System Specifications:

- Intel® Pentium® 4 processor 1.80GHz
- 256MB DDR SDRAM • 40GB hard drive
- Integrated 10/100 Ethernet • CD-ROM
- Microsoft® Windows® XP Professional
- 3-yr parts and onsite labor limited warranty[5]

$949 NavCode™ 831911U-M477

With Microsoft® Office XP Small Business		$1,049
Customize Yours: Smartdisk USB Floppy Diskette Drive	(#31P7647)	$59.99
ServicePac® Service Upgrade 4-yr onsite/9x5x4-hr Response	(#69P9162)	$250

@server

Value server for Small Businesses

IBM @server xSeries 205

Distinctive Features:

- Diagnostic LEDs, Automatic Server Restart® and Predictive Failure Analysis® help to improve uptime
- IBM Director Software — Recipient of *PC Magazine's* Editors' Choice award on October 1, 2002

System Specifications:

- Intel® Pentium® 4 processor 1.80GHz
- 256MB DDR memory std/2GB max[8]
- 40GB UATA 100 EIDE hard drive std/480GB max
- Hot-swap drive bay models available
- 5 available slots/6 available bays
- Integrated Gigabit Ethernet
- Available IBM Remote Supervisor Adapter
- Toolless tower chassis with optional 4U rack mounting
- 1-yr parts and onsite labor limited warranty[5]

$839 NavCode™ 848013X-M477

(does not include operating system, may not include other features)

20/40GB TR7 IDE Internal Tape Drive[9]	(#48P7042)	$549
ServicePac® Service Upgrade 3-yr onsite/9x5/4-hr Response	(#69P9510)	$348

IBM®

Easy migration with IBM

With optional IBM data migration kits, transferring your configurations and personal settings to your new system has never been easier.

Build your own NetVista desktop or @server system.

IBM technology, your design. Visit **ibm.com** for more details.

IBM NetVista Accessories

IBM 128MB PC2100 DDR[2] SDRAM Memory Upgrade	(#31P8376)	$50
IBM Wireless Keyboard and Mouse Kit	(#22P5170)	$89
IBM 256MB PC2100 DDR SDRAM[2] Memory Upgrade	(#31P8377)	$100
HP ScanJet 3500c	(#22P8668)	$104.99
Targus DEFCON Authenticator with USB Hub	(#31P6762)	$119.99
Lexmark Z65 Color Jetprinter (with system purchase)	(#W7LEX65)	$119.99
IBM UPS 675	(#33L3478)	$159
Iomega Zip 750MB External USB 2.0 Drive	(#22P7099)	$179.99
HP Officejet D135 All-in-One (USB only)	(#31P7627)	$499.99

Upgrade your system with Microsoft® Office XP Small Business to Microsoft® Office XP Professional with Publisher for only $169 more.

Call **1 866 426-7004** or go to **ibm.com**/shop/m477

to buy direct, locate an IBM reseller or for more information.

NavCode™ Get the latest pricing and information fast. Use NavCode on the phone or on the Web.

IBM recommends Microsoft® Windows® XP Professional for Business.

Warranty Information: For a copy of applicable product warranties, write to: Warranty Information, P.O. Box 12195, RTP, NC 27709, Attn: Dept. JDJA/B203. IBM makes no representation or warranty regarding third-party products or services. *Prices do not include tax or shipping and are subject to change without notice. Reseller prices may vary. [1]Available for download through Access IBM. [2]For NetVista models without a separate video card, memory supports both system and video. Accessible system memory may be up to 64MB less than the amount stated, depending on video mode. [3]GB = 1,000,000,000 bytes when referring to storage capacity; accessible capacity is less. [4]Some software may differ from its retail version (if available) and may not include user manuals or all program functionality. Software license agreements may apply. [5]Telephone support may be subject to additional charges. For onsite labor, IBM will attempt to diagnose and resolve the problem remotely before sending a technician. [6]Certain Microsoft software product(s) included with this computer may use technological measures for copy protection. IN SUCH EVENT, YOU WILL NOT BE ABLE TO USE THE PRODUCT IF YOU DO NOT FULLY COMPLY WITH THE PRODUCT ACTIVATION PROCEDURES. Product activation procedures and Microsoft's privacy policy will be detailed during initial launch of the product, or upon certain reinstallations of the software product(s) or reconfigurations of the computer and may be completed by Internet or telephone (toll charges may apply). [7]These services are available for machines normally used for business, professional or trade purposes, rather than personal, family or household purposes. Not all machine types and models are covered. Service period begins with the equipment date of purchase. Service must be purchased during the original limited product warranty period. Service levels are response-time objectives and are not guarantees. A service technician is scheduled to arrive at your location within two or four business hours or the next business day (depending on service) after remote problem determination is completed. For the 9x5x4-hour service, calls dispatched after 1:00 p.m. local time, you can expect the service technician to arrive by the morning of the next business day. For noncritical service requests, a service technician will arrive by the end of the following business day. If the machine problem turns out to be a Customer Replaceable Unit (CRU), IBM will express ship the part to you for quick replacement. Onsite 24x7x2-hour service is not available in all locations. External peripherals, such as racks, tape drives and channel controllers, require their own, separate service coverage; they are not covered under the attached Machine. Service activation is required immediately following purchase. For ThinkPad notebooks requiring LCD or other component replacement, IBM may choose to perform service at the depot repair center. For failing non-IBM components, customer must provide replacement part unless IBM has a Technical Support Agreement with the manufacturer. Service does not cover accessories, supply items and certain parts such as batteries, frames and covers. [8]Maximum memory varies depending on model and may require replacement of standard memory with optional memory module. [9]Actual storage capacity will vary based upon many factors and may be less than 40GB. (Numbers given for storage capacities give capacity in native mode followed by capacity using data compression technology.) All offers subject to availability. IBM reserves the right to alter product offerings and specifications at any time, without notice. IBM is not responsible for photographic or typographic errors. All IBM product names are registered trademarks or trademarks of International Business Machines Corporation in the U.S. and other countries. Lotus and SmartSuite are registered trademarks of Lotus Development Corporation, an IBM Company. Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft and Windows are trademarks or registered trademarks of Microsoft Corporation. Other company, product and service names may be trademarks or service marks of others. ©2002 IBM Corp. All rights reserved.

Hands-on reviews and technology buying advice

NEW PRODUCTS

EDITED BY ANNE B. MCDONALD

Tiny and Terrific

DIGICAMS SCARCELY LARGER THAN A FILM CANISTER STILL PACK IN THE MEGAPIXELS.

DIGICAMS (clockwise from left) from Fujifilm, Canon, and Sony.

DIGITAL CAMERAS

A BULKY DIGITAL camera is like an SUV: If you have trouble finding a place to park it, you'll probably leave it at home a lot. But you won't have that problem with three new models from Canon, Fujifilm, and Sony—the camera equivalents of nimble subcompacts.

The $400 Canon **PowerShot S230 Digital Elph**, the $350 Fujifilm **FinePix F402**, and the $270 Sony **Cyber-shot DSC-U20** each weigh less than half a pound and can slip into most pockets (or hang around your neck—the Fujifilm and Sony models include tethers; the Canon has a fitting to accept one). The shipping Canon we tested packs a 3.2-megapixel resolution, compared to 2.1 megapixels on the shipping Fujifilm and 2 megapixels on the preproduction Sony.

SIZE MATTERS MOST

THE CANON Digital Elph, introduced in mid-2000, was the first respectable miniature digital camera. This newest Elph, while still small, seems almost chunky in comparison to the tiny FinePix F402 and the Cyber-shot DSC-U20. The PowerShot S230's exquisite stainless-steel body feels substantial and looks exotic compared to most other digital cameras—big or small. It fits easily into a shirt pocket, but its heft may make carrying it there uncomfortable.

Fujifilm's F402 is flat—similar in shape and style to the Kodak Disc film cameras of the early 1980s, but smaller. Its aluminum alloy body feels almost as well-made as the Canon's, but its small size allows it to fit comfortably in a shirt pocket. Its coolest design feature: a trance-inducing, ice-blue light that glows briefly when the camera turns on.

The smallest of the three cameras, the Sony Cyber-shot DSC-U20, has a magnesium-alloy case that will fit comfortably almost anywhere, including a front pants pocket; an adult can even conceal it easily in one hand. All three cameras protect their lenses with retracting covers.

To stuff features into their small cases, these cameras do make concessions in ease of use. All have tiny buttons that make changing settings a bit trying. Fujifilm positioned the FinePix F402's macro, digital zoom, and flash setting buttons together in a straight line where your thumb rests, and I flubbed several shots by pushing one of the buttons without realizing it. The Sony DSC-U20's most glaring fault is its thumbnail-sized LCD screen: It's so tiny that framing shots

PHOTOGRAPHS: MARC SIMON

Cyber-shot DSC-U20

Sony

(Preproduction version, not rated)

In addition to being the smallest digital camera we've seen, it has the smallest LCD screen.

List: $270

find.pcworld.com/31742

INSIDE

74 **DIGITAL CAMERAS**
Canon PowerShot S230 Digital Elph, Fujifilm FinePix F402, Sony Cyber-shot DSC-U20

76 **PDAs**
Dell Axim X5, Palm Zire, Royal Linea16, ViewSonic Pocket PC V35

78 **AUDIO CARD**
Creative Labs Sound Blaster Audigy 2 Platinum

NOTEBOOK
Best Buy VPR Matrix 200A5

78 **MEMORY CARD READER**
PQI-USA Travel Flash 2.0 USB 6 in 1 Card Reader

DVD SOFTWARE
InterVideo WinDVD Recorder

MP3 PLAYER
CenDyne Grüvstick

80 **WEB ACCELERATORS**
Artera Turbo Residential, Propel Accelerator, Proxyconn Accelerator

82 **LCDs**
WinBook Display C1900, Samsung SyncMaster 191N

86 **UTILITY**
Symantec Norton Ghost 2003

88 **UTILITY**
PowerQuest PartitionMagic 8

90 **ONLINE SERVICES**
America Online AOL 8, Microsoft MSN 8

FEATURES COMPARISON

Digicams Get Smaller, Lighter

CAMERA	Price	Dimensions[1]	Weight (camera/camera with charger)[2]	Resolution (megapixels)	Screen size (inches, diagonal)	Zoom
Canon PowerShot S230 Digital Elph	$400	3.4 by 2.2 by 1.1 inches (cigarette pack)	7.8 ounces/ 10.6 ounces	3.2	1.5	2X optical
Fujifilm FinePix F402	$350	3.0 by 2.7 by 0.9 inches (Altoids tin)	5.0 ounces/ 8.8 ounces	2.1	1.5	3.6X digital
Sony Cyber-shot DSC-U20	$270	3.4 by 1.6 by 1.2 inches (large chewing gum pack)	4.1 ounces/ 10.5 ounces	2.0	1.0	2X digital

[1] In order: width, height, depth. [2] With battery and media.

is difficult, and it also causes on-screen information (such as shot number) to obscure images during playback.

TRAVELING LIGHT

ALL THREE DIGICAMS come with chargers and rechargeable batteries. The Sony has the smallest camera body, but its charger is about four times the size of the camera, with a thick, 6-foot-long cord, and together they weigh almost as much as the Canon and its charger. The Fuji's charger is much smaller, with electrical prongs that fold inward—but its cord, while thin, is just as long as the Sony's. Canon offers the best design by far: Its lightweight charger is the same size as the camera, but it has no cord—its prongs fold into the charger when not in use, and the battery slides into the charger. We didn't run formal battery testing on these models, but the FinePix F402 held out longest on a picture-snapping weekend trip.

Conveniently, the FinePix F402 also works with a good-looking $80 optional cradle that recharges the camera's battery and connects to your computer via USB; the camera's memory card shows up as a drive letter on your PC.

The FinePix F402 also uses a new flash-memory card format, XD-Picture Card, that is less than half the size of a SmartMedia card. This new card is supposed to be faster, stingier on battery consumption, and more durable. XD-Picture Cards should eventually hold up to 8GB of data.

Thanks to its higher resolution, zoom lens, and more-sophisticated exposure controls, the Canon took the best photos of the three. But like many others, both the PowerShot S230 and the Sony DSC-U20 fire the flash twice in dim settings—once to get a reading to set the exposure, and once to illuminate the subject. That slows down both cameras, although the Sony is slightly faster. The FinePix F402 uses an external flash sensor, and it proved to be the fastest of the three when using the flash.

All three cameras can capture MPEG movies, although all produce somewhat choppy video. The Canon cannot adjust its aperture while recording a movie, so if your subject moves from a shadow into the light, that portion of the movie will appear overexposed. The Sony doesn't record audio.

SMALL IS ALL

THE CANON PowerShot S230 Digital Elph takes the best pictures in this group. And the Sony DSC-U20 definitely wins points for its small size (except for the tiny LCD screen). For a superportable camera, however I liked Fujifilm's attractive FinePix F402 best. It snaps good pictures with little fuss, it has a relatively large LCD screen, and it is just about as easy to tote around as the smaller Sony.

—Alan Stafford ▶

FinePix F402

Fujifilm

★★★★

Attractive and well made, it's as good a camera you'll find for the size and the price.

Street: $350

find.pcworld.com/31736

PowerShot S230 Digital Elph

Canon

★★★★

A fine design, but it's a bit chunky for weight watchers.

Street: $400

find.pcworld.com/31739

ACTUAL SIZE: New XD-Picture Card media (bottom).

PDA Bargain Bonanza

PALM ZIRE (left) and Royal Linea16, both $99.

PDAs

HIGH-END PALMS and Pocket PCs can cost $500 or more, but several vendors now offer personal digital assistants—some with comparable features—for more-modest budgets. I looked at four such newcomers: Dell's Pocket PC–based **Axim X5**, ViewSonic's **Pocket PC V35**, Palm's **Zire**, and Royal's **Linea16**.

Dell and ViewSonic—both making their debuts in the PDA market—offer breakthrough pricing for Pocket PC 2002 devices. ViewSonic's lightweight (4.2 ounces), compact (4.8 by 3.0 by 0.4 inches) V35 ($299) is powered by a zippy new 300-MHz Intel XScale CPU. The preproduction unit I looked at featured a handsome 64K-color transflective LCD, 32MB of ROM, 64MB of SDRAM, and a Secure Digital disk slot.

DELL AXIM X5 (left) and ViewSonic Pocket PC V35.

The Axim X5 is available in $349 and $249 versions (before a $50 rebate). Both are powered by rechargeable, removable batteries; the more expensive model comes with a cool syncing/recharging cradle that has a dedicated slot for charging a spare battery (not included). But thanks to the removable battery, the Axim X5 measures 5 by 3.2 by 0.7 inches and checks in at a hefty 6.9 ounces; my preproduction unit looked bulky next to the slinky Pocket PC V35.

The $349 Axim XS's specs either match the V35's—including its screen—or exceed them, with a 400-MHz XScale CPU and both SD and CompactFlash slots. The $249 X5 substitutes a sync cable for the recharging cradle and comes with a 300-MHz XScale chip as well as 32MB of RAM.

SUB-$100 PDAs

BASED ON the older (but still very capable) Palm 4.1 OS, the monochrome-screen Zire's chic white plastic case has just two buttons for launching applications (addresses and a datebook), instead of the customary four. You get a USB cable for hot-syncing data (to either Palm's desktop organizer or Outlook) and an internal rechargeable battery.

The Zire's 2MB of memory (no expansion slot) is sufficient for a reasonable number of contact entries and some apps, but skimpy by current PDA standards. In addition, my shipping Zire lacked a backlight. I'd rather spend my $99 on the older Palm M105 and put up with Palm OS 3.5 and serial-port syncing in return for getting a backlight and much more memory (8MB).

The main selling point of Royal's Linea16 is a built-in 56-kbps modem to send and receive e-mail from a dial-up POP3 account (but currently not AOL or MSN e-mail).

The Linea16 runs a proprietary OS, so you miss out on thousands of Palm or Pocket PC apps. But you get 16MB of memory. The Linea16 syncs with Royal's desktop software and with Outlook, Goldmine, ACT, and Lotus Organizer.

You enter data via either a software keyboard or natural characters in a pop-up handwriting input area; and the device's backlit monochrome screen is slightly larger than a Palm's. I found that setting up e-mail with a preproduction unit was tricky, however, and the icon-based navigation is difficult to master.

Despite their budget prices, I can't wholeheartedly recommend the Palm Zire or the Royal Linea16. But the ViewSonic Pocket PC V35 and the Dell Axim V5 are exceptionally worthy models for any prospective Pocket PC owner.

—Yardena Arar ▶

Axim X5
Dell
(Preproduction version, not rated)
Dell's first handheld is an outstanding Pocket PC value.
Street: $349 or $249, depending on configuration
find.pcworld.com/32054

Zire
Palm
★★★☆☆
No backlight prevents use of this entry-level Palm in the dark.
Street: $99
find.pcworld.com/32060

Linea16
Royal
★★★☆☆
Inexpensive dial-up POP3 e-mail checker, but no AOL or MSN e-mail support; proprietary OS.
Street: $99
find.pcworld.com/32063

Pocket PC V35
ViewSonic
★★★★☆
Excellent deal for a thin and lightweight Pocket PC.
Street: $299
find.pcworld.com/32066

PHOTOGRAPHS: MARC SIMON

Separate and protect your valuable data

With new PartitionMagic® 8.0

It's a well-known fact that the best way to keep some things safe is to keep them separate. It's the same with your PC.

Dividing your hard disk into separate drives (partitions) is the ideal way to safeguard data and improve your computer's performance. PartitionMagic 8.0 makes it quick and easy to create and resize partitions without reformatting your drive. So, whether you're looking for a way to run multiple operating systems on the same computer, or protect your data files from potentially harmful applications, games or downloads, now you can do it safely. And for a limited time, when you purchase PartitionMagic 8.0 you'll also receive the award-winning PowerQuest DataKeeper™ for free. DataKeeper is a powerful "real time" data protection program that automatically backs up your valuable data to a separate partition or removable media.

PartitionMagic 8.0

Buy PartitionMagic 8.0 today at your local computer reseller. For a free demo, white paper on the benefits of partitioning, or more information on PartitionMagic 8.0, call 1-888-497-9998 or visit www.powerquest.com/pcworld

BEST BUY.com COMPUSA Fry's ELECTRONICS Office DEPOT STAPLES

© 2002 PowerQuest Corporation. All rights reserved. The PowerQuest products may be protected under U.S. and International patent law or pending patents. PowerQuest and PartitionMagic are registered trademarks, and PowerQuest DataKeeper is a trademark of PowerQuest Corporation in the United States and elsewhere.

POWERQUEST

PROVEN SOLUTIONS FOR STORAGE MANAGEMENT

Superior PC Audio Gear

AUDIO CARD

PC AUDIOPHILES, start your drooling now. Creative Labs moves desktop audio up another octave with its Sound Blaster Audigy 2, the first sound card that lets you listen to DVD-Audio (DVD-A) playback at either 24 bits/192 kHz (for two-channel stereo) or 24 bits/96 kHz (for full six-channel surround sound).

SOUND BLASTER Audigy 2 Platinum.

The new card really shines with DVD-A. It can reproduce sound frequencies out to 96 kHz. Standard CD audio (16 bits/44.1 kHz) cuts off at 20 kHz, roughly the uppermost range of human hearing. Although you can't actually hear these higher frequencies, studies have shown that their presence does result in the perception of a deeper and wider sound stage.

I tested a shipping version of the **Sound Blaster Audigy 2 Platinum** package ($199)—the bundle contains the convenient Audigy 2 Drive, which places RCA analog inputs, a FireWire connector, jacks for headphones and microphone, and ports for a DVD player, an AV amplifier, and MIDI devices in a drive bay.

I paired the Platinum package with Creative's new 120-watt Inspire 6.1 6000 speaker system. After playing CD and DVD-A versions of the Eagles' "Hotel California" through a DVD drive and the 6.1 speaker system, I found it was no contest: The DVD-A was more involving, and the soundstage was astonishingly deep.

—*Ramon G. McLeod*

Sound Blaster Audigy 2 Platinum
Creative Labs
★★★★½
A superior sound card package with DVD-A capabilities.
List: $199
find.pcworld.com/31814

Best Buy's Big Screen

NOTEBOOK

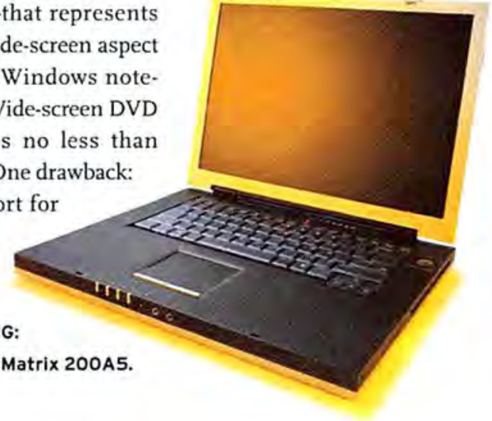
TEST Center NATIONAL electronics retailer Best Buy now offers a stylish laptop that can handle your computing needs as well as crank out top-notch audio and video entertainment. Packing a 2-GHz Pentium 4-M processor, along with 512MB of DDR SDRAM, an NVidia GeForce4 420 Go graphics chip, Windows XP Home, and a DVD-ROM/CD-RW combo drive, the **VPR Matrix 200A5** is competitively priced at $2400. It also has two USB 1.1 ports, two FireWire ports, and integrated adapters for both ethernet and Wi-Fi (802.11b) wireless networks, and it weighs 7.4 pounds with charger and phone cord.

The unit's most notable feature is its 15.2-inch-wide display with 1280 by 854 native resolution—that represents the largest wide-screen aspect ratio yet for Windows notebook users. Wide-screen DVD playback was no less than astounding. One drawback: The audio port for PC speakers is on the notebook's front. To hook up home stereo speakers to the parallel port on the rear of the notebook, you'll need to purchase Best Buy's optional Digital Parallel Cable with RCA connectors ($250).

In our formal tests, my shipping model scored a respectable 106 on PC WorldBench 4, and its battery lasted for an average of roughly 2.5 hours.

—*David J. Lake* ▶

VPR Matrix 200A5
Best Buy
★★★★☆
Laptop handles daily office tasks easily, but really shines when playing DVDs and CDs.
List: $2400
find.pcworld.com/31820



GOOD LOOKING: Best Buy VPR Matrix 200A5.

QUICK TAKES

Memory

PQI-USA's **Travel Flash 2.0 USB 6 in 1 Card Reader** (roughly the size of a cassette tape) will let you read or write to CompactFlash, Memory Stick, MicroDrive, Multi Media, Secure Digital, and SmartMedia cards. You can insert up to three of these media at once.
find.pcworld.com/31988

Direct to Disc

WANT TO ARCHIVE those soon-to-be-extinct *Farscape* episodes, using your PC? InterVideo's **WinDVD Recorder**, along with a TV capture card, lets you record your favorite television shows or any digital video source in real time to CD or rewritable DVD disc, using high-quality 720-by-480 MPEG-2 compression.
find.pcworld.com/32003

Music

SLAP AN MP3 player into a USB keychain-size storage device and package it with a miniature FM radio transmitter—and you've got CenDyne's **Grüvstick**. Once you upload your tunes via the 128MB unit's USB connection, the $179 device plays about 2 hours of MP3 music compressed at 128 kbps, through earphones or any nearby FM radio receiver. The player can also double as a recording device so you can easily take quick verbal notes.
find.pcworld.com/31991

AUDIGY AND MATRIX PHOTOGRAPHS: MARC SIMON

PowerStruXure

Why new PowerStruXure™?

Why save money, space and time in your data center?

You no longer need to design your data center using an outmoded approach.

From 1kW to 5MW, APC PowerStruXure™ architecture provides a patent-pending, systematic approach to building data center infrastructure utilizing standardized, pre-assembled components.

Lower Costs

PowerStruXure's scalable, modular design lets you build out your capacity only as it's required, optimizing your CapEx.

The simplicity of design lowers OpEx and lessens your dependency on expensive service contracts.

Reclaim space

PowerStruXure's rack-optimized design lets you reclaim an average 20% of useable space within your installation that was previously needed for infrastructure equipment.

Speed infrastructure deployment

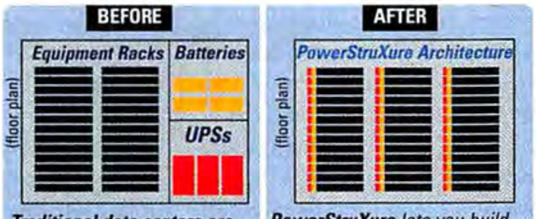
PowerStruXure dramatically accelerates your deployment schedule with configure-to-order components and a pay-as-you-grow approach. Modular system components are easily replaceable, decreasing repair times.

Adapt to unexpected contingencies

With PowerStruXure, there's no need to abandon your previous investment – whether you need to physically move your data center or adapt to technology refreshes.

Vendor-neutral

Best of all, you will never be boxed in by proprietary solutions. PowerStruXure is compatible with all major server and internetworking platforms, including HP/Compaq, Dell, IBM, Sun, Cisco, Lucent, and Nortel, guaranteed.



***Traditional data centers** are built out for future capacity and require a large amount of floor space that could be otherwise utilized.*

***PowerStruXure** lets you build out capacity only as it's required. Save up to 50% CapEx and 20% OpEx*, and reclaim an average of 20% usable space.*

HP/COMPAQ • SUN • IBM
GUARANTEED COMPATIBILITY
DELL • CISCO • LUCENT

*With **"Fits Like a Glove"** money back guarantee! See Web Site below for details.*

"I enjoy the fact that I can buy only what I need now and add to it later only when I need to."

Michael Touchstone
Manager of Energy Conservation,
Cox Communications

Top 100 Products
2002
Readers' Choice
Windows & .NET Magazine
Government Computer News Best New Technology Awards at FOSE
Winner 2002

Winner of the Windows and .Net Magazine *"2002 Reader's Choice Award for Best High Availability Solution" and the GCN "Best New Technology Award" at FOSE, March 2002.*

APC®
Legendary Reliability™

*Representative savings based on projected power infrastructure build-out costs and estimated service cost per unit. Actual savings may vary.

Planning a data center is easy! Try our online configurator today!

or download a FREE White Paper: "Avoiding Costs from Oversizing Data Center Infrastructure"

Visit http://promo.apc.com Key Code h971y • Call 888-289-APCC x2582 • Fax 401-788-2797

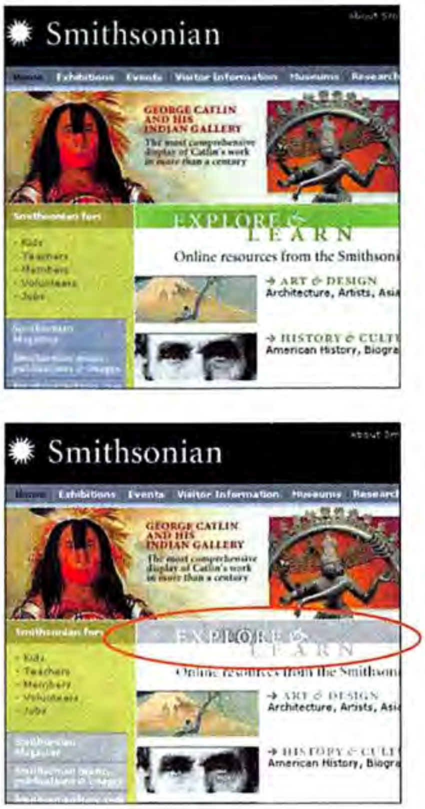
©2002 American Power Conversion Corporation. All Trademarks are the property of their owners • E-mail: esupport@apcc.com • 132 Fairgrounds Road, West Kingston, RI 02892 USA • PSX4B2EF-US

Speed Up Your Dial-Up Connection

WEB ACCELERATORS

YOU'VE SEEN THE claims in pop-up ads or spam e-mail: "Warning: Your Internet Connection is Not Optimized!" or "Increase your Internet Speed 3 Times." Is it all poppycock, or do bona fide bandwidth boosters really exist?

I looked at three of a new breed of Web accelerator services: Artera Group's **Artera Turbo Residential**, Propel Software's **Propel Accelerator**, and Proxyconn's **Proxyconn Accelerator**. While all promise to dramatically reduce Web page delivery times, during my informal tests, none of the three services delivered perfectly. However, each of them did boost the loading speed of typical Web pages on my test PC (which had a 933-MHz Pentium III CPU, 256MB of RAM, Windows 98, and a 56-kbps modem)—significantly enough to make using one of these services a serious consideration for any dial-up user.



PROPEL ACCELERATOR can display some Web images in monochrome to speed delivery.

HOW THEY WORK

MODEM-SPEEDING packages—and hype—have been around since Internet use became widespread. But the new offerings work by storing Web pages and/or by compressing graphics and text, via a collaboration between their desktop software on your computer and smart caching of the Web pages on their own servers for quick page display.

Artera Turbo Residential, Propel Accelerator, and Proxyconn Accelerator aren't identical, but each service supplements your Internet Explorer or Netscape browser's existing cache with its own souped-up version. The idea is to store Web pages on your hard drive upon your first visit to the pages, and then to limit the information you download on subsequent visits to those pages to only the data that changes, making for a faster download. These services then go a step further by essentially storing popular Web pages on their servers at strategic geographic points around the Internet. Since the information is situated closer to users, it loads faster onto their PCs.

Artera's and Propel's services both speed up first visits to Web sites by using their servers to compress a page's graphics and text on the fly and then pipe them to your computer. Proxyconn relies on its exceptional caching technology on its servers and your PC for its speed, recompressing graphics and text on the fly, then sending them to you.

Both Artera's and Propel's software allow you the choice of shrinking the file size of graphics and pictures, resulting in faster downloads but blurry images. Propel also permits you to display some images in monochrome only.

Each service is available as a quick software download and piggybacks on your existing Internet service. (Artera doesn't currently support AOL, though the company says it will soon.) But be prepared for monthly fees: Artera charges $10; Propel, $5 (or $50 annually); and Proxyconn, $9 (or $80 annually).

AND THE FASTEST IS...

IN MY INFORMAL tests, Propel was the fastest of the three in viewing text- or graphics-heavy Web pages for the first time, taking an average of 9.75 seconds to load text pages and 12.9 seconds for graphics pages. In comparison, a 56-kbps modem took, on average, 28.7 seconds and 49.5 seconds, respectively. Proxyconn was the snappiest when displaying either type of page on second visits, taking, on average, about 4 seconds for each, while the modem alone took, on average, 14 seconds and 20.7 seconds. Artera was the second-speediest of the three services, on average, for both visits to text-heavy Web pages and first visits to graphics-laden pages; it was last, on average, for second visits to graphics-intensive Web pages.

It's worth noting that Proxyconn's speed boost to reloading those graphics-filled pages was unparalleled at 3.7 seconds, on average, compared with the unaided modem's average of 20.7 seconds.

Be aware, however: These three services definitely can't compete with the raw capacity of cable or DSL connections when you're doing bandwidth-hogging tasks such as swapping music files or connecting to multiplayer games.

—*Tom Spring* ▶

Artera Turbo Residential
Artera Group
★★★☆☆
Easy to use but overall is the least effective of the three.
List: $10 per month
find.pcworld.com/32078

Propel Accelerator
Propel Software
★★★★☆
Speedy, inexpensive, and most configurable of the services.
List: $5 per month, $50 per year
find.pcworld.com/32084

Proxyconn Accelerator
Proxyconn
★★★½☆
A good choice if you visit the same sites over and over.
List: $9 per month, $80 per year
find.pcworld.com/32081

BrightStor
BrightStor
BrightStor
ARCserve Backup

It's so far forward, it's a shame to call it backup.

ARCserve v9 is here

Apparently the word is out everywhere. BrightStor™ ARCserve® Backup is among the most reliable and widely used backup solutions in the world. In fact, hundreds of thousands of people rely on BrightStor ARCserve Backup technology to protect their critical servers. Now we've created BrightStor™ ARCserve® Backup v9, the most advanced version ever. As part of the BrightStor™ line of storage management solutions, BrightStor ARCserve Backup v9 is amazingly powerful yet one of the simplest to use and easiest to install solutions out there. In fact, most users can perform their first backup within 20 minutes of start-up. And that means it's the perfect backup software choice for, well, just about everyone. ca.com/brightstor/arcserve9

BrightStor™ ARCserve® Backup Computer Associates™

© 2002 Computer Associates International, Inc. (CA). All rights reserved.

A Good Buy in a Large LCD

WINBOOK (left), Samsung LCDs.

PHOTOGRAPH: MARC SIMON

MONITORS

IT'S TRUE: Once you've had the luxury of a flat screen, you'll never want to go back.

After testing the well-priced 19-inch shipping WinBook **Display C1900**, I can't see returning to my 17-inch CRT. This basic LCD with analog inputs, 1280 by 1024 resolution, and built-in speakers costs only $699. In comparison, Samsung's **SyncMaster 191N** has similar specs, but it is priced at $300 more.

Text and image quality on the C1900 were both good. It rendered darks slightly deeper than the Samsung, but also washed out some brighter hues. Details were sharp, and text looked crisp down to 7.5 points. The C1900 does have drawbacks: Its buttons lack labels, and the sound is tinny.

WinBook's first entry in the monitor market is fully adjustable, but to use it in landscape mode, you'll have to buy specialized pivoting software.

The classy but pricier SyncMaster 191N has a thin, silver bezel; clearly marked menu buttons; and a low-profile black base. It is also fully adjustable, and the rotation software is included.

Fonts on the SyncMaster 191N were easily readable down to a minuscule 6.8 points in size. Photo details were plentiful, and colors appeared rich and accurate.

The WinBook C1900 clearly is the better value. However, the SyncMaster 191N may win you over with its looks and warranty (three years versus the WinBook's one).

—Tom Mainelli ▶

Display C1900
WinBook
★★★★☆
Good display with a great price.
Street: $699
find.pcworld.com/31778

SyncMaster 191N
Samsung
★★★½☆
Beautiful LCD offers an excellent warranty but has a higher cost.
Street: $999
find.pcworld.com/31781

Join the fan club!

Users from around the world have been using R-Studio... haven't you?

Now from R-Tools Technology, the leading provider of powerful data recovery and undelete solutions for the Windows OS family comes... R-Studio 2.0

Recover your data from local and remote computers over a network. Whether your files were lost after a virus infection, power failure, FAT damage, partitioning errors or even disk formatting, R-Studio can recover your data. Dynamic Disk and RAID support are included.

"I was able to retrieve 95% of my files from a damaged disk!!
President and CEO
NumberOne Technologies, LLC

"A Great Product and Exceptional Value"
RAI Digital

Try, then buy at:
www.r-studio.com

rtt r-tools technology

© Copyright 2002 R-tools Technology Inc.
Microsoft, Windows, the Windows logo are trademarks, or registered trademarks of Microsoft Corporation in the United States and/or other countries.

Designed for Microsoft® Windows® XP, 2000, ME, 98, Windows NT®

Quick. Before defragmenting, you may wish to consider one additional accessory.

PerfectDisk "is blindingly fast"

Microsoft® Certified Professional Magazine, November 2002

PerfectDisk® 2000 Version 5. (Shades not included.)

Microsoft® Certified Professional Magazine also said stuff like, "In all cases, the results were superb" and "...installing and using PerfectDisk is simple."

PerfectDisk defrags disks quickly and totally; one pass, done. Fact is, there's just no other product faster, more accurate or more complete. And, PerfectDisk is the only defragmentation solution on the market that's Windows 2000 certified for servers and workstations.

What's more, our generous trade-up policy means you can make the leap to lightspeed without blinking an eye. Why wait? Download a free demo copy today. Trust **PerfectDisk**... from RAXCO Software, the leader in disk optimization software tools for more than 25 years.

Microsoft
GOLD CERTIFIED
Partner

RAXCO
software
Perfect Software for an Imperfect World

www.perfectdisk.com

Certified For Microsoft Windows
Windows 2000 Server
Windows 2000 Professional

Designed for
Microsoft®
Windows® XP
Windows® 2000

1-800-546-9728
www.raxco.com

All products or company names listed are Registered Trademarks and Trademarks of their respective holders. Microsoft, Windows, and the Windows Logo are registered trademarks of Microsoft Corporation in the United States and/or other countries.

› Home improvement.

Compaq Presario 6300US | Home

Quick Shop Code: QS-150

- Intel® Celeron® processor 1.4 GHz
- Microsoft® Windows® XP Home Edition
- 128MB SDRAM
- 40GB Ultra DMA Hard Drive*
- 48X Max CD-ROM†
- Compaq MV7500 17" Display (16" VIA)
- 4 USB 1.1 (2 Front, 2 Rear)

Just Add:

- HP Deskjet 3820 Printer: Add $49.99 (after $50 bundle mail-in rebate)‡
- HP PhotoSmart 120 digital camera: Add $99.99

$549

$799 - $250 mail-in rebate = $549**

Compaq PCs use genuine Microsoft® Windows® www.microsoft.com/piracy/howtotell

Prices shown refer to hpshopping.com selling prices and do not include applicable sales tax and shipping, are valid in the U.S. only and are subject to change or cancellation without notice. Products, prices and availability subject to change without notice. See hpshopping.com for more details. Illustrations may not accurately represent exact configurations priced. Retail prices may vary. HP is not liable for editorial, pictorial or typographical errors in this advertisement. *For hard drives, GB=billion bytes. †48X Max CD-ROM data transfer rates may vary from 2500 to 7200 Kbps. ‡$50 mail-in-rebate offer good on the purchases made between 10/6/02 and 1/4/03 on qualifying HP Deskjet printers and HP PhotoSmart digital cameras when purchased with any qualifying monitor and Desktop PC or Notebook PC. **$50 PC mail-in rebate, $150 monitor mail-in-rebate, $50 PC/monitor bundle mail-in-rebate offer good on purchases made between 10/6/02 and 1/4/03 on qualifying Compaq Presario Desktop PCs and Monitors. ‡‡‡$100 mail-in-rebate offer good on purchases made between 9/22/02 and 2/23/03 on qualifying Compaq Presario Notebook PCs. Products purchased before or after these dates are not eligible for this offer. Purchase date is determined by invoice or receipt date. These offers are combinable with other HP offers. Offers not valid on refurbished HP products. Offers are limited to product on hand, and NO substitutions with other products are eligible. Keep copies of materials submitted; originals become HP property and will not be returned. HP reserves the right to request additional information regarding this claim. False information disqualifies this claim, making it subject to review under U.S. postal regulations or Canadian law. Violators may be prosecuted. Only purchases made by an end-user

Compaq Presario 6330US

Home | **Quick Shop Code: QS-155**

- Intel® Pentium® 4 processor 2 GHz
- Microsoft® Windows® XP Home Edition
- 256MB DDR SDRAM
- 60GB Ultra DMA Hard Drive*
- 40X Max CD-RW Drive‡‡
- 16X Max DVD-ROM Drive***
- Compaq FS7550 17" Flat Screen (16" VIA)
- 6 USB 2.0 (2 Front, 4 Rear)

Just Add:

- HP Deskjet 5550 Printer: Add $99.99 (after $50 bundle mail-in rebate)‡
- HP PhotoSmart 620 digital camera: Add $149.99 (after $50 bundle mail-in rebate)‡

$949

$1,149 - $200 mail-in rebate = $949**

Compaq Presario 906US

Home | **Quick Shop Code: QS-146**

- AMD Athlon™ XP processor 1500+ with PowerNow!™ Technology
- Microsoft® Windows® XP Home Edition
- 256MB DDR SDRAM
- 20GB Ultra DMA Hard Drive
- DVD/CD-RW Combo Drive
- 14.1" XGA TFT Display
- ATI Radeon™ IGP Integrated Graphics with 16MB shared video memory†††

Just Add:

- Presario battery 4.4 900 series: Add $129.99
- HP Deskjet 5550 Printer: Add $149.99 (after $50 bundle mail-in rebate)**

$999

$1,099 - $100 mail-in rebate = $999†††

Compaq Presario 1516US

Home | **Quick Shop Code: QS-14B**

- Intel® Pentium® 4 processor 2 GHz
- Microsoft® Windows® XP Home Edition
- 256MB DDR SDRAM
- 30GB Ultra DMA Hard Drive*
- DVD/CD-RW Combo Drive
- 14.1" XGA TFT Display
- ATI Radeon™ IGP Integrated Graphics with 32MB shared video memory†††

Just Add:

- Presario battery 4.4 1500 series: Add $129.99
- Presario 90W AC adapter: Add $49.99

$1,299

$1,399 - $100 mail-in rebate = $1,299†††

Buy now ›

Toll free 1-866-288-7841
compaq.com/pcworld2
At your local retailer

COMPAQ

hp invent

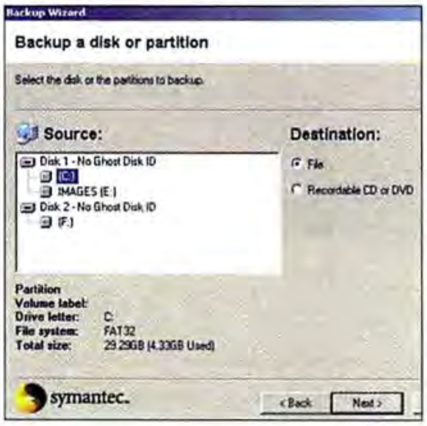
hpshopping.com is a subsidiary of Hewlett-Packard.

customer or a commercial business from an authorized HP reseller in the United States, Canada and their territories are valid. Purchases by HP resellers and internal HP orders are ineligible. Offer void where prohibited, taxed or restricted by law. ‡‡40X CD-RW Drive data transfer rates may vary as follows: for recording to CD-R media, the max transfer rate may be up to 6000 Kbps (use 40X discs for best performance); for writing to CD-RW media, the max transfer rate may be up to 1800 Kbps (use 4X–12X high-speed media discs for best performance); for reading CD media, the max transfer rate may be up to 6000 Kbps. Actual transfer rates may vary depending on media quality. ***16X DVD-ROM Drives read a minimum of 5545 Kbps and a maximum of 21640 Kbps. †††Shared video memory (UMA) uses part of the total system memory for video performance. For example, if there are 128MB of system memory and 16MB of shared memory for video graphics, the system has 112MB left of available system memory for other computing activities. Intel® Pentium® 4 processor speed denotes maximum performance mode on AC power; processor speed on battery power is approximately 64% of maximum performance mode. Intel, the Intel Inside Logo, Celeron and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. Microsoft, MS and Windows are registered trademarks of Microsoft Corporation. AMD, AMD Athlon, PowerNow! and combinations thereof are trademarks of Advanced Micro Devices, Inc. Products and company names mentioned herein may be trademarks and/or registered trademarks of other companies. hpshopping.com is a subsidiary of Hewlett-Packard. © 2003 Hewlett-Packard Company.

Skip Norton Ghost 2003

UTILITY

SYMANTEC **Norton Ghost 2003** looks impressive on paper, but on the job this backup-cum-disk-imaging program is for truly patient PC pros only.


Backup Wizard

Backup a disk or partition

Select the disk or the partitions to backup.

Source:
Disk 1 - No Ghost Disk ID
(C:)
IMAGES (E:)
Disk 2 - No Ghost Disk ID
(F:)

Destination:
● File
○ Recordable CD or DVD

Partition
Volume label:
Drive letter: C:
File system: FAT32
Total size: 29.29GB (4.33GB Used)

GHOST 2003 offers a new backup wizard.

Ghost 2003 has some good features. It can make an exact copy (clone) of your hard disk, from data to the state of the OS, so it's a natural tool for system recovery, duplicating your desktop PC on your laptop, or moving everything from an old PC to a new system. It can store drive images on just about any kind of media—including another hard drive in your computer, a network server, an external USB or FireWire hard drive, or various CD-RW and DVD-RW/+RW discs. This version also adds Linux and NTFS support; largely eliminates the need for a boot disk; and lets you join two PCs via a USB, parallel, or network connection and then clone one to the other.

Despite claims to the contrary, however, my tests with a shipping copy of Ghost 2003 clearly showed that inexperienced users should beware. The program is saddled with a confusing manual, lousy Web support, and phone support that costs $30 per incident.

I found its new "intuitive Windows interface" inconsistent. And Ghost 2003 crashed one test PC and refused to clone the drive on another, though it would perform a standard backup. (However, Symantec said it was unable to replicate my experience.)

One other feature allows restoration of specific folders or files. Load an Explorer-like tool, pick a folder/file, select File•Extract, and then point to the destination. Alas, it didn't always work. In one of my tests, Ghost 2003 cloned a PC to an external USB drive, but uninstalled the drive.

In light of these difficulties, I'd say this program should be tried by power users only.

—Robert Luhn ▶

Norton Ghost 2003
Symantec
★★☆☆☆
Backup/disk-cloning program is hard to use, buggy, and poorly documented.
List: $70, upgrade $50
find.pcworld.com/31772

Support Anyone From Anywhere

Mac OS X Ready

Windows XP Ready

With Netopia's eCare you can enable your call center to collaborate with anyone from anywhere. Observe and control far away desktops, engage in live chat while pushing Web pages, diagnose technical problems, share files and even share your own desktop. Firewall friendly, Web-enabled, on-demand. **How? Just Click and Connect.**

Contact us for a demonstration: **http://www.netopia.com/en-us/ecaredemo.html**
For more information, call 1-800-689-9293 or e-mail to **wpginfo@netopia.com**

netopia.

NEC

No matter who you are, now there's an intelligent flat-panel monitor just for you.

Introducing the new NEC MultiSync® 60 Series LCD monitors. Intelligence, performance and value make them the right choice anywhere. Only from the leading brand of stand-alone flat-panel monitors. There are many different types of computer users out there. But whether you compute for work or fun, now you can benefit from the clarity, precision and smart design of our most versatile line of flat-panel monitors.

The 60 Series has something for everyone. Just choose the model with the intelligent features you need. Like NEC's Rapid Response™ technology for lifelike full-motion video display. No-Touch Auto Adjust™ for optimal screen settings upon initial power-up. Built-in multimedia capabilities for exciting gaming action. Or LiquidView™ bundled software for high-resolution readability.

Ergonomic cabinet design, thin frames and choice of cabinet colors help the monitors fit into virtually any space, while cable management keeps wires at bay. In addition, their minimal energy consumption and a vacation switch that completely shuts down the monitor's power mean a lower total cost of ownership. Pretty smart, huh?

Learn more at www.necmitsubishi.com/intelligent or call 888-NEC-MITS.

SEE MORE.™

NEC MultiSync monitors.
Bright outside. Brilliant inside.

Smart technologies

Model	1560V	1555V	1560NX	1560M	1760V	1760NX	1760VM	1860NX
Rapid Response	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Thin Frame	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No Touch Auto Adjust	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LiquidView Software	No	Yes	No	No	Yes	Yes	Yes	No
Multimedia	No	No	No	Yes	No	No	Yes	No
Vacation Switch	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cable Management	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Input Interface Connectors	VGA	VGA	DVI-D & VGA	DVI-D & VGA	VGA	DVI-D & VGA	DVI-D & VGA	DVI-D & VGA

NEC ranked as the #1 best-selling stand-alone LCD monitor brand according to the Stanford Resource—iSuppli Flat Panel Monitrak™ Quarterly Report, Q2 '02. See More, LiquidView, No Touch Auto Adjust and Rapid Response are trademarks, and MultiSync is a registered trademark of NEC-Mitsubishi Electronics Display of America, Inc.

©2002 NEC-Mitsubishi Electronics Display of America, Inc. All rights reserved. Simulated images in monitors.

NEC/MITSUBISHI
NEC-MITSUBISHI ELECTRONICS DISPLAY

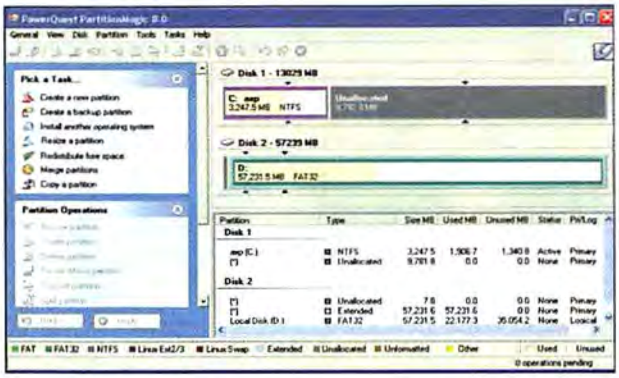
Partitioning Plus Backup

UTILITY

POWERQUEST'S PartitionMagic software—long recognized as the best program for creating, resizing, and generally working with hard-drive partitions—has always come with a warning that it might destroy data. I've been using this program for years, but a shipping copy of **PartitionMagic 8** gave me my first major catastrophe. One of its new capabilities—resizing the clusters on an NTFS partition—rendered my particular Windows XP Professional PC unbootable. I recovered by booting from the XP CD-ROM and using Microsoft-provided tools, but this is an option you may not have if XP came loaded on your PC and you have no CD-ROM. (Note: The problem didn't occur with XP Home on the PC.)

PartitionMagic 8
PowerQuest
★★☆☆☆
New version adds backup software but little else of real value.
List: $70, upgrade $50
find.pcworld.com/31745

PartitionMagic is useful if you want the most efficient drive possible, prefer to keep your data completely separate from your programs, or need to boot multiple operating systems. Among version 8's new features is a browser that gives you access to files on partitions you otherwise couldn't get to—for instance, those on an NTFS partition if you're using Windows 98 or Me. PartitionMagic 8 comes bundled with PowerQuest's real-time backup program, DataKeeper. And you can now boot from the CD-ROM to load PartitionMagic 8 in emergencies.


PowerQuest PartitionMagic 8.0
General View Disk Partition Tools Tasks Help
Pick a Task...
Create a new partition
Create a backup partition
Install another operating system
Resize a partition
Redistribute free space
Merge partitions
Copy a partition
Partition Operations
Disk 1 - 13029 MB
C: asp
3,247.5 MB NTFS
Unallocated
Disk 2 - 57239 MB
D:
57,231.5 MB FAT32
FAT
FAT32
NTFS
Linux Ext2/3
Linux Swap
Extended
Unallocated
Unformatted
Other
Used
Unused
0 operations pending

Partition	Type	Size MB	Used MB	Unused MB	Status	Pri/Log
Disk 1						
asp (C:)	NTFS	3,247.5	1,906.7	1,340.8	Active	Primary
(*)	Unallocated	9,781.8	0.0	0.0	None	Primary
Disk 2						
(*)	Unallocated	7.8	0.0	0.0	None	Primary
(*)	Extended	57,231.6	57,231.6	0.0	None	Primary
Local Disk (D:)	FAT32	57,231.5	22,177.3	35,054.2	None	Logical

PARTITIONMAGIC 8 offers users a Windows XP-style interface.

Already have an older version of this program? Keep it. If you don't own a partitioning application and want one, PartitionMagic 8 is worth considering—but I'd recommend that you take its backup warnings very seriously.

—*Lincoln Spector* ▶

To Serve and to Protect

KerioMailServer5

for secure email communication

- Integrated McAfee anti-virus
- Anti-spam protection
- Attachment & Subject filtering
- Encrypted access via IMAP, POP3 and WebMail
- Public and private address books
- Active Directory integration
- Windows, Linux RedHat

KERIO McAfee SECURITY

Download the 30-day trial www.kerio.com

EXPERIENCE THE POWER OF THE FUTURE TODAY

FREE

17" NEC Monitor with Every System

Plus $100 Rebate

Home Systems

From $749*

Gaming Systems

From $999*

Dual Processor Systems

From $1449*

AIPCS

SYSTEMS TECHNOLOGIES

Available in 8 Custom Colors

🟦 ⬛ 🟩 🟪 🟧 ⬜ 🟨 ⬜

Customize your own machine at WWW.AIPCS.COM

Order Toll Free

1.877.247.4500

"Others Promise, We Deliver!"

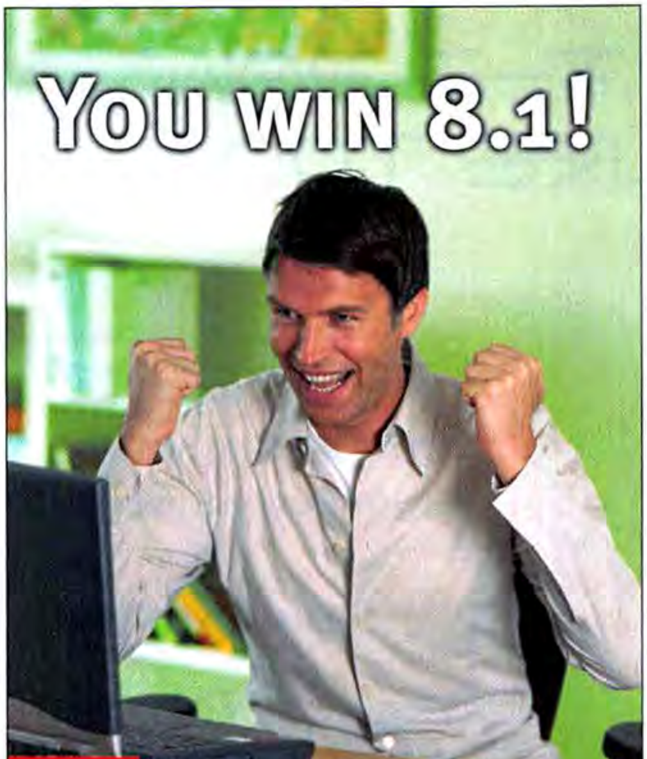
All PC World Readers

10% off

Expires: January 31st

use promo code: PCWORLD

Prices, configuration, and availability may change without notice. AIPCS cannot be held responsible for errors in photography or typography. 24 hour online service may be provided via contracted third party. All registered trademarks and trademarks are the property of their respective owners. Shipping promotion includes desktop unit and proprietary peripherals. Monitor, speakers, and additional accessories shipped separately. Quoted from prices on each classified system represents basic configurations. Price reflects mail-in rebate. Free monitor is offered as a standard component, however removal would cause offset of price. PC World promo discount applicable maximum $200 value.



NEW SuSE Linux 8.1

Putting you in the winners' circle with open standards

For beginners: SuSE Linux 8.1 Personal

- Free MS-Office-compatible office suite OpenOffice
- Secure Internet and e-mail communication
- Easy to use – including daily planner, multi-media player, etc.
- And lots more!

For professionals: SuSE Linux 8.1 Professional

All the advantages of the personal version plus:

- Automatic network identification during mobile use
- Intelligent software installer with advanced features
- Extensive hardware recognition, incl. USB2
- Built-in security thanks to configurable firewall
- And lots more!

SuSE Linux is celebrating its 10 year anniversary! We owe our success to you, thus we would like to thank you for your loyalty.

Please bill the following address:

Company

Name

Street

Postal-Code Zip-Code

E-mail Phone

☐ Personal 8.1 $39.95

☐ Professional 8.1 $79.95

Order online today! http://shop.suse.com/pw

info@suse.com (888) 875-4689 (510) 628-3381

SuSE Inc. — The Linux Experts
318 Harrison Street, Suite 301
Oakland · CA 94607

AOL and MSN: Duel at 8

ONLINE SERVICES

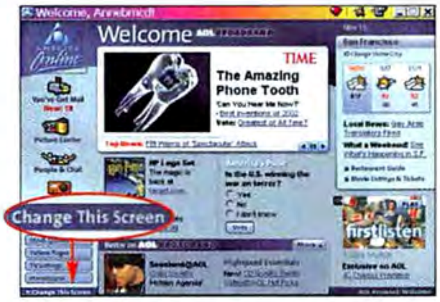
SPAM AND SMUT blocking, along with personalized Web experiences for users, are the big themes in tuned-up Internet access services from America Online and Microsoft.

AOL 8 still delivers far more members-only content (like new music and video offerings), pays closer attention to the needs of its massive population of dial-up customers with services such as making sure accidentally disconnected members know what happened in their chat room while they were gone, and provides the largest online community of any ISP. Too many of **MSN 8**'s features are available free at MSN.com to make a switch from another ISP worthwhile.

For AOL's 35 million members, AOL 8 tackles spam with improved junk mail filters—but unfortunately it hasn't improved its crude e-mail system, which forces you to double-click and open each e-mail just to preview the message's contents. A new ad policy that restricts pop-ups from third-party advertisers, as well as AOL itself, offers partial compensation. (Note: *PC World* is an AOL content provider.)

MSN, with 9 million subscribers, nips at AOL's heels with new members-only software such as Money (for online bill payments), Encarta Online for reference, and Picture It for digital photography.

A welcome MSN 8 addition is an e-mail module, closely mimicking Outlook Express, that contains terrific antispam controls and preview panes. Also offered are its first-ever parental controls, which strive to keep kids safe while online.



WELCOME PAGES are easily changed in AOL 8.

MSN 8 also has a new, highly configurable My MSN start page, while AOL 8 offers new emoticons and sound options for AIM, as well as six new but fairly similar Welcome pages.

Pricing for the two services is comparable. For unlimited dial-up Internet access and membership, you'll spend some $24 a month for AOL versus $22 a month for MSN.

—Tom Spring ■

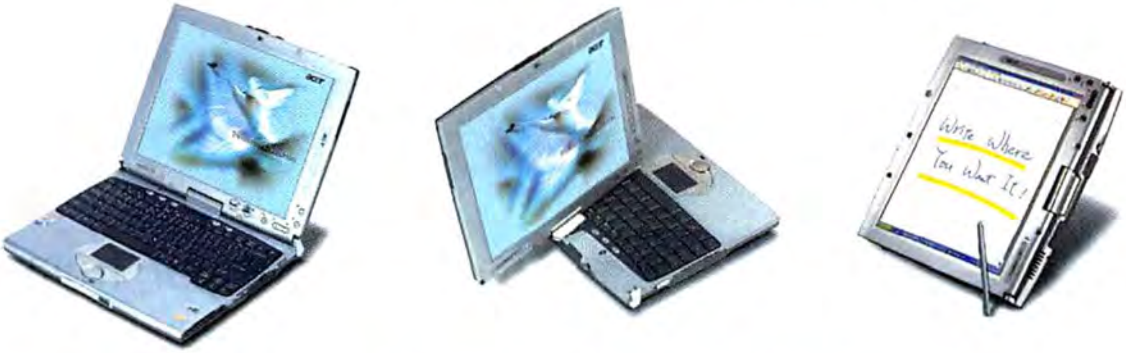
AOL 8
America Online
★★★★☆
Clever updates freshen a familiar, well-done service.
List: $24 per month for unlimited dial-up access and membership privileges
find.pcworld.com/32072

MSN 8
Microsoft
★★★½☆
New offerings are good, but not enough to coax a switch.
List: $22 per month for unlimited dial-up access and membership privileges
find.pcworld.com/32075

The World's First Convertible PC

Running Windows® XP Tablet PC Edition

Acer TravelMate™ C100 Convertible Tablet PC with Mobile Intel® Pentium® III Processor - M



Winner of the 2002 Intel Innovative PC Award

The TravelMate™ C100 revolutionizes mobile computing by uniting the ultra-portable notebook PC of today with the tablet computer of tomorrow.

Buy from Acer at 1-800-637-7777 or www.shopacer.com or contact your local reseller

The convertible hinge allows the notebook screen to swivel up to 180°, and fold back into Tablet PC mode.

Acer's EMR pen and Microsoft's inking technology enable natural handwriting as a form of input.

Wireless connectivity enhances user mobility in the office and on the road.

TM C102Ti **$2,199**

- Mobile Intel® Pentium® III Processor - M @ 800Mhz ULV
- 256MB RAM
- 30GB HDD
- 3.1 lbs.
- 10.4" XGA TFT LCD w/ digitizer
- External USB 24X CD-ROM
- 802.11b WLAN
- 56K v.90 Data/Fax Modem
- 10/100 Fast Ethernet
- 2X Li-Ion Battery Pack
- Smart Card Reader
- Full Size Pen
- Windows XP Tablet

TM C102T **$1,999**

- Mobile Intel® Pentium® III Processor - M @ 800Mhz ULV
- 256MB RAM
- 20GB HDD
- 3.1 lbs.
- 10.4" XGA TFT LCD w/ digitizer
- External USB 24X CD-ROM
- 56K v.90 Data/Fax Modem
- 10/100 Fast Ethernet
- 1X Li-Ion Battery Pack
- Smart Card Reader
- Full Size Pen
- Windows XP Tablet

Acer recommends Microsoft® Windows® XP Professional for Mobile Computing

*Intel, the Intel Inside logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Prices are estimated street price, reseller price may vary. Price subject to change without notice.

acer

Empowering People

BY THE EDITORS OF PC WORLD

WHAT'S HOT FOR 2003

The year in preview—from the tech gear you'll buy to Web services you'll try.

Predictions are always perilous in the PC industry, but one thing's certain: Technology buying decisions won't become any easier in 2003. New gizmos—and old standbys with new shapes, sizes, and functions—will improve your communications, make your workload seem lighter, and maybe even make your life a little more enjoyable.

Five-megapixel digital cameras will fit in your pocket for the first time.

ILLUSTRATIONS:
CAMPBELL LAIRD

PHOTOGRAPHS:
KEVIN CANDLAND

Wireless networking will get easier and faster—and more confusing—as a bevy of new 802.11 standards arrive. And AMD's Clawhammer processor, the company's first entirely new processor core in three years, promises an exciting beginning to the year.

But cheaper/better/faster isn't the only story for 2003. Web sites will continue to institute subscription fees, and debate will persist over who should pay to recycle used PC parts. Digital video will make its way into your home and onto your handheld, as television-recording PCs try to occupy your living room, and PDAs get better at multimedia. Systems built around Microsoft's new Windows XP Tablet Edition will have people scribbling on computer screens in corporate hallways and meeting rooms. Yet another new optical storage technology is looming. And a new version of Microsoft's Office suite is on the horizon, though it won't work with Windows operating systems older than XP or 2000. Some things never change.

Finecam S5
KYOCERA
OLYMPUS
CAMEDIA
C-50 ZOOM
W
T

KYOCERA Finecam S5 (left) and Olympus C-50 Zoom.

DIGITAL CAMERAS

More Megapixels, Smaller Cameras

PEOPLE LOVE COMPACT digital cameras—the smaller and more full-featured, the better. Expect to see a handful of pocket-size cameras in 2003 boasting resolutions up to 5 megapixels and able to produce sharp, highly detailed photographs. Among the leaders of this trend are Kyocera and Olympus. Kyocera's $600 Finecam S5 offers 5-megapixel resolution and features a slick brushed-silver body that fits in the palm of your hand, à la Canon's popular PowerShot Digital Elph series. Olympus's $599 Camedia C-50 Zoom has 5-megapixel resolution, too, but it's slightly wider than the Finecam. Both should be available now.

This year, digital cameras should make their way into more PDAs, cell phones, MP3 players, and other devices, either as a built-in feature or as an attachable component. Sanyo, Motorola, Nokia, Samsung, Olympus, and Sony are among the vendors introducing these camera-enabled devices. —*Grace Aquino*

WIRELESS NETWORKING

802.11 ALPHABET SOUP—FASTER, MORE SECURE, AND MEDIA-READY

WIRELESS IS JUST getting warmed up. The success of 802.11b in 2002 may have been only a prelude to a wireless blitz poised to strike in the second half of 2003, as products based on three new 802.11 standards debut. Last summer saw the introduction of the first products supporting 802.11a, which has a top transmission speed of 54 mbps (802.11b's theoretical maximum is 11 mbps). Get ready for three more wireless letters in 2003: 802.11e, 802.11g, and 802.11i (see chart at right). The first of these standards, 11e, supplements 802.11a and -b (as well as -g) to enhance quality of voice, video, and other media transmissions. The 11g standard runs at 802.11a's 54-mbps rate but is backward-compatible with -b products. Finally, 11i improves on the WEP wireless security protocol by adding the 128-bit Enhanced Security Network standard, which uses the new Advanced Encryption Standard algorithm.

The last details of the -e, -g, and -i standards should be worked out by the end of 2002; but some vendors, such as Cirrus Logic with its WhiteCap2 initiative, are jumping the gun by offering their own signal quality and security solutions already. Before you purchase a new wireless system, keep in mind that proprietary approaches may not be compatible with the new standards. *–Dennis O'Reilly*

802.11 STANDARD	What it means to you
802.11a	54-mbps top speed; incompatible with 802.11b.
802.11b	11-mbps top speed; popular in home and small-business networks.
802.11e	Enhances audio and video transmission on 802.11a, b, or g networks.
802.11g	New standard with 54-mbps top speed; compatible with 802.11b.
802.11i	Adds enhanced 128-bit encryption to 802.11a, b, or g networks.

PROCESSORS

I Wanna Be Your Clawhammer

AMD'S SUCCESSFUL Athlon CPU line is in for some big changes in 2003. In its ongoing race with Intel (see *News and Trends*, page 26), AMD has built a new hot-rod—an entirely new chip called Clawhammer that will replace the Athlon XP in early 2003. Besides the usual improvements—higher clock speeds, better memory access, and faster overall performance—Clawhammer has something extra in store: It's the first 64-bit processor you'll find in desktop PCs.

Why does AMD think you need 64 bits? Memory is one reason: A 32-bit CPU can address up to 4GB of memory—more than enough for current desktop PCs. But servers are already pushing past that limit, and AMD is betting that today's 1GB desktops will soon become tomorrow's 4GB systems.

Still, most of the benefits of 32-bit CPUs came after they could run a 32-bit operating system, with drivers and applications to match. Microsoft hasn't announced plans to release a 64-bit OS designed for Clawhammer, so no one knows when that transition will occur. Fortunately, Clawhammer is compatible with existing 32-bit applications.

—*Eric Dahl* ▶

MARKETPLACE

Product Releases for 2003

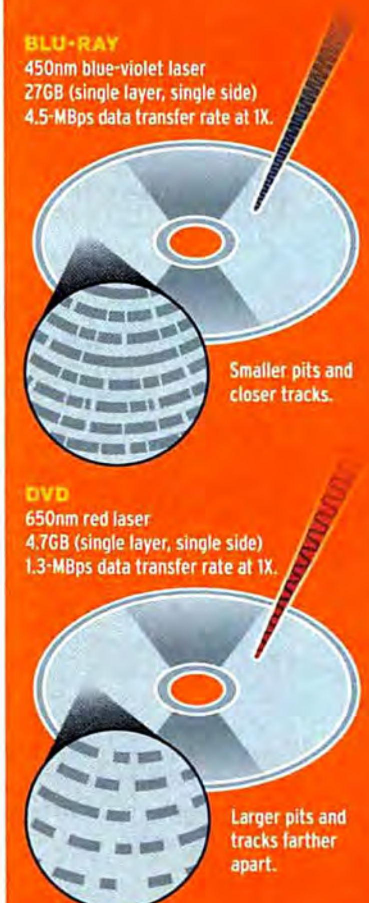
PLANNING A PURCHASE? Look ahead with our timeline of technology milestones and new products set to debut in the coming year.

	1ST QUARTER	2ND QUARTER	3RD QUARTER	4TH QUARTER
Storage	First 2X DVD-R drives arrive.	Desktop machines begin to ship with 300GB hard drives.	U.S. sales of CD/DVD-recordable drives surpass sales of CD/DVD-ROM drives for the first time.	Serial ATA is integrated into chip sets; all new PCs will use it by late 2004. Write-once DVD hits 8X; portable DVD reaches 4X.
CPUs/Chip sets	AMD's Barton (Athlon XP with 512KB cache) and Clawhammer (see above) desktop chips debut. Intel's 3GHz P4 chips debut. Celeron hits 2GHz.	Intel Banias processors debut. P4 Mobile hits 2.2 GHz.	Summer 2003: Mobile Athlon chips based on Clawhammer hit the market.	.09 micron AMD Clawhammer chips arrive.
Digital cameras	The first pocket-size 5-megapixel cameras ship. Kodak's 14-megapixel DCS Pro 14n SLR digital camera ($5000) hits the market.	»	Prices of 4-megapixel cameras drop below $400.	»
Video cards	Boards based on NVidia's GeForce FX graphics processing unit (see page 100) arrive.	ATI plans to launch its next-generation GPU.	DirectX 9-capable mainstream and value GPUs from NVidia emerge.	»
Cell phones	Chips in removable faceplates let you add ring tones and other custom features.	First devices using Microsoft's Smartphone software arrive in the United States.	»	3G cell phone services still dwarfed by 2G and 2.5G services.

OPTICAL STORAGE

27GB DVDs

THE CD ISN'T dead yet, and already we're planning for the DVD's demise? Late this year we could see the arrival of the first drives based on Blu-ray technology, a type of optical storage that uses blue lasers to record data onto DVD-size discs. Since blue lasers have a shorter wavelength, they can burn smaller pits than your DVD or CD drive. Smaller pits mean more densely packed data, which in turn means more storage—to the tune of a whopping 27GB for a single-sided, single-layer Blu-ray disc (see below). That's enough space to store 13 hours of DVD-quality video, or more than 2 hours of high-definition video. *—Eric Dahl*


BLU-RAY
450nm blue-violet laser
27GB (single layer, single side)
4.5-MBps data transfer rate at 1X.
Smaller pits and closer tracks.
DVD
650nm red laser
4.7GB (single layer, single side)
1.3-MBps data transfer rate at 1X.
Larger pits and tracks farther apart.

INPUT DEVICES

The Pen That Never Forgets

THERE'S NOTHING ordinary about Logitech's new digital pen, the Io. Tucked inside the Io's bulky, cigarlike body is an optical sensor that captures your handwriting as you write. The Io can store pages of your scribbles, and it uses a USB cradle to turn your digital scrawl into Microsoft Word or Outlook documents, on-screen sticky notes, or other forms.

The Io requires special digital paper, 80 sheets of which come with the $200 package (refills cost $10 each). You need to spend a few minutes training the software to recognize your handwriting. Each page of the digital paper contains a series of checkboxes that let you specify whether your notes will end up in an e-mail message, a calendar entry, a Microsoft Word file, or a to-do item. But the pen's software converts your handwriting to editable text in only a few situations. For example, the software will open an e-mail window and automatically plug in an e-mail address and subject line after you write them on the special paper.

In our tests, the Io's handwriting recognition improved the more we used it. The Io is pricey, but if you're a manic note-taker, this pen could be very handy. *—Aoife McEvoy*

LOGITECH'S Io pen, with special digital paper and USB cradle.

MONITORS

LCDs Take Center Stage

LOOK OUT, BIG, beige CRT—your days are numbered. According to DisplaySearch's Annual LCD Monitor Strategy Report, last year, for the first time, LCDs topped CRTs in total sales revenue; and LCDs are expected to eclipse CRTs in unit sales in 2004. LCD prices will keep dropping this year: 15-inch units should reach a low price of $300, while 17-inch models—predicted to be the most popular LCD size—should drop to about $450. Prices on 19- to 23-inch models will fall as well, but large LCDs will continue to cost more than their smaller siblings.

Some LCD manufacturers place the image processor and all other electronics directly on the glass, allowing for sleeker profiles and thinner bezels. More vendors are expected to do likewise with their new models.

Most LCDs will continue to have both analog and digital (DVI) interfaces, because many graphics cards don't include DVI-out. *—Kalpana Narayanamurthi*

SAMSUNG SyncMaster T172.

HANDHELDS

Movies That Fit in the Palm of Your Hand

FASTER PROCESSORS, beefier storage, and increasing cooperation from Hollywood could lead to a boom in video-to-go in 2003. Companies like Pocket PC Films and Web services like Mazingo are converting movies, TV shows, and news programs into Windows Media Video (WMV) files sized for playback on PDAs. Few titles are available thus far—mainly older and obscure or niche movies like *Night of the Living Dead*—but both companies say bigger Tinseltown deals are coming. Expect to pay about $15 a month or $100 a year for the services.

This year's handhelds will add screen space and memory to accommodate video: The $449 PoGo Flipster, a dedicated movie and music player that debuted in 2002, has a 2.5-inch LCD (diagonal) and 128MB of memory (enough to play one movie-length WMV file). Sonicblue's ReplayTV Personal Video Player will debut in 2003 with a screen of up to 4 inches, a 40GB hard drive, and a 400-MHz processor. Sonicblue's player can handle more advanced video codecs such as MPEG-4 and even MPEG-2, which is often used in set-top digital video recorders. See find.pcworld.com/31784 for more on video-capable handhelds. *—Seán Captain*

Play
Game
Setup
Record
PIMS
Main

POGO Flipster.

AUDIO/VIDEO

Serving Up Your Home Media

IF YOU HAVE A LARGE MP3 collection on your PC, you know how convenient it is to have all your music in one place. In 2003 a group of devices called home media servers will attempt to bring digital music, photos, and video into your living room. You'll see high-end PCs designed to work with your TV, inexpensive specialized PCs running custom Linux-based operating systems, and consumer-electronics devices that combine personal video recorder functions with a DVD burner.

Sorting out the winners among such a mixed bag of products is going to be tough, however. PCs based on Microsoft's Windows XP Media Center Edition hit the market just in time for the 2002 holidays. HP's Media Center PC was a capable machine, but at $2749 it's expensive (see find.pcworld.com/32057). InteractTV's $699 Telly combines a Via C3 processor, a 60GB hard drive, and a custom Linux-based OS in an attractive package for recording TV and playing MP3s. *—Eric Dahl* ▶

TREND

NEWS FLASH: THE WEB WON'T STAY FREE

YOU'VE BEEN BROWSING the Web for years, and—apart from the monthly payment to your ISP—you haven't opened your wallet once. (We're not counting your many online purchases.) You've even installed a pop-up stopper and an ad blocker to keep your browsing commercial-free. Face it: You're a Web freeloader. But somebody's got to pay for all that great information you pick up from your favorite sites.

The Web is tough to make a living on if you're in the information business. In what other industry do vendors have to convince their customers to pay for something they're used to getting free? Slowly, inexorably, and with more than a few hiccups, the Web is evolving into a great big subscription service—whether you like it or not.

Leading the way are big online names like The New York Times, which now charges for full access to its archives, and Consumer Reports, whose product ratings have always carried a price tag. Print publications can use services such as Zinio (a *PC World* partner) to create and sell electronic versions of their magazines.

Critics point out that people who've switched from a $22-a-month dial-up account to a $50-a-month broadband service won't be anxious to pay even a couple of extra bucks a month anytime soon. Even the least expensive subscriptions will be a tough sell for quite some time. But don't be surprised if this is the year in which for the first time you find yourself paying a Web site for its content. *—Dennis O'Reilly*

OFFICE SUITES

Office Remodeling

BY NOW, YOU'VE probably heard about the new version of Office—code-named Office 11—that Microsoft promises to ship in the summer of 2003. (Turn to the *News and Trends* story on page 40 for our first impressions of the early beta.) A lot of the hype has centered on the new version's closer embrace of XML, a Web-development language that simplifies the tasks of moving data from one format to another. If it works as advertised, that feature will benefit lots of people—saving them time when they have to shuttle information from their company's databases to spreadsheets and Word documents, for example. (Unfortunately, the new Office will run only on Windows XP and 2000 SP3, and not on earlier versions of the operating system, according to the company's current plan.)

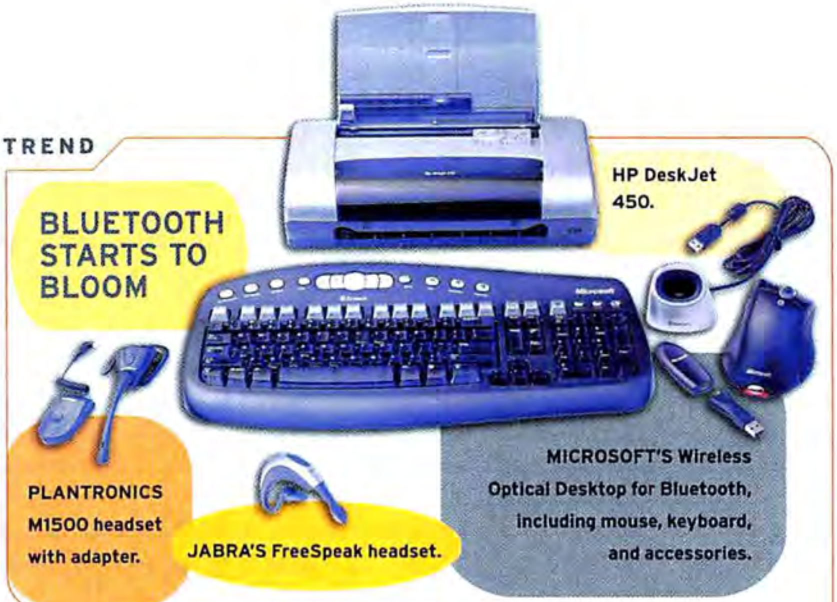
If you spend more time relating to people than to databases, you'll probably be more impressed by the changes in Outlook. Microsoft has redesigned the in-box, arranging the list of incoming mail and the preview of the top message in vertical panes. This simple change greatly increases the amount of information you can see on a screen. Outlook also adds colored flags for marking and categorizing messages, and some new ways to search through your e-mail backlog.

Picture Library, a new application in Office 11, scans your PC (and the network that you're connected to) for images and shows the contents of folders as thumbnails. The library also allows you to rename a whole batch of photos at once.

—Ed Albro ▶

TREND

BLUETOOTH STARTS TO BLOOM



HP DeskJet 450.

PLANTRONICS M1500 headset with adapter.

JABRA'S FreeSpeak headset.

MICROSOFT'S Wireless Optical Desktop for Bluetooth, including mouse, keyboard, and accessories.

WE'VE BEEN hearing about Bluetooth wireless technology for over four years now. The spec, called Bluetooth after the surname of a tenth-century Danish king, has been final since 2000, but products incorporating it have been slow to appear. Late in 2002 we got our hands on the first real crop of Bluetooth products, including Microsoft's Bluetooth-ready mouse and keyboard (see above). The $159 Wireless Optical Desktop package includes a very comfy mouse, a keyboard, and a transceiver. If you have HP's $299 Bluetooth-ready Deskjet 450 mobile printer parked in another room, you can easily beam pages through most walls for it to print.

The popularity of cell phones—and some states' legislation prohibiting their use while driving—has spawned other types of Bluetooth accessories: Plantronics' M1500 ($200) and M1000 ($120) Bluetooth-enabled headsets use an ear loop to attach to your ear. The M1500 comes with an adapter that works with most non-Bluetooth cell phones that can accommodate a headset. Jabra's $179 FreeSpeak works with non-Bluetooth phones, too—and it's more comfortable than the Plantronics headsets, thanks to its soft gel earpiece. Expect to see many more companies (such as Logitech) jumping on the Bluetooth bandwagon in 2003.

—Aoife McEvoy

NOTEBOOK STORAGE

Rewritable DVD to Take With You

THE MARKET FOR REWRITABLE DVD DRIVES is maturing faster than the CD-RW market did—in spite of battling rewritable DVD formats. The outcome of the format wars—highlighted by the scuffle between leaders DVD+R/+RW and DVD-R/-RW—remains uncertain, but it's safe to say that speeds will double and prices will drop in 2003 as more manufacturers ramp up production.

The first portable rewritable DVD drive, Toshiba's SD-R6012 Slim, arrived in the fall of 2002 and Sony's most recent VAIO notebook series included a model using Toshiba's 12.7mm high, 7-ounce 1X DVD-R and DVD-RW writer that weighs just 7 ounces. A version of Toshiba's drive will offer 2X DVD-R write speeds by early 2003, in line with upcoming slimline notebook burners that support either the DVD-R/-RW or the DVD+R/+RW format, or some combination of the two.

Notebook DVD burners currently cost about 50 percent more than DVD-ROM/CD-RW combination drives. However, industry experts expect that difference to shrink as volume production increases and prices of rewritable DVD drives fall. Write-once burning speeds might reach 4X by the end of 2003; but many insiders believe that the driving factor behind the demand for notebook burners will not be speed, but decreasing costs and the ability to burn discs that work in DVD video players.

—Melissa Perenson

So thin. So bright. So desirable. So affordable.

VE175b
$100
MD 33.1
VM 2.1
PR 29.9
VM 23.
BL 12.4
CC 24.9
ViewSonic

THE VE175 17" LCD'S. SEE WHY VIEWSONIC® IS #1 IN THE WORLD.*

Available in both black (VE175b) and beige (VE175) trim, stylish profile looks great, and saves desktop space.

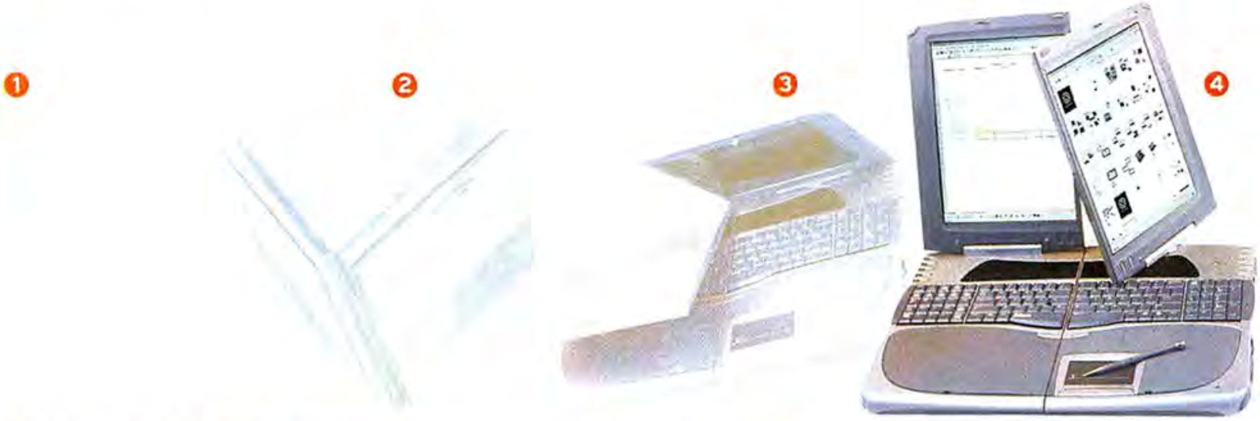
When you look at the big picture, it's easy to see why the VE175 LCD displays are no ordinary 17-inch computer monitors. They totally shatter the myth that LCDs have to be expensive to be great. ViewSonic's advanced SuperClear MVA™ and XtremeView™ technologies combined with superb 550:1 contrast ratio give you images with vibrant color and clarity. No fuzziness. No flicker. Just razor sharp detail, deep rich hues and exceptional 250 nit brightness at viewing angles up to 170 degrees. The VE175 is one of a complete line of high performance ViewSonic LCDs at remarkably affordable prices. Whether for work, entertainment, gaming, or professional applications like photography, graphic arts or CAD design, there's a screen size and feature set that's right for you. It took the Visual Technologies™ leader to shatter the LCD price and performance barrier. So now you can satisfy your high standards and your desire for value at the same time. Visit **ViewSonic.com** or call **1-800-888-8583** and See The Difference® that makes ViewSonic displays number one in the world.

See it all.

ViewSonic®
See the difference.®

---

*Leading non-captive monitor brand by sales: Stanford Resources, Inc. (Worldwide Monitor Tracking Report Q2, 2002). Availability, pricing and specifications subject to change without notice. Corporate names and trademarks herein are the property of their respective companies. Copyright © 2002 ViewSonic Corporation. All rights reserved. [10772-00E 10/02]



FOUR STEPS to a unique portable PC: Step 1 **Xentex's Flip Pad Voyager notebook PC (closed).** Step 2 **Unfold.** Step 3 **Open the dual screens.** Step 4 **The right screen pivots for presentations.**

GRAPHICS BOARDS

The 3D Graphics Wars Continue

NOTHING SPURS innovation like a rivalry. NVidia, the market leader among graphics chip makers, claims its upcoming GeForce FX chip will offer cinematic realism, as well as support for 8X AGP and Microsoft's DirectX 9. The GeForce FX should have twice the pixel-rendering power and three times the frame rate of NVidia's current top-of-the-line GeForce4 Ti 4600 chips. At press time, sources at NVidia expected cards based on the new chips to arrive in stores at the start of 2003.

While the GeForce FX may restore the 3D performance lead to NVidia, the company may not hold that honor for long. In August 2002, ATI released the Radeon 9700 Pro, which surpassed GeForce4 Ti 4600 chips in our speed and image-quality tests. And ATI's new generation of chips—which it claims will trump the GeForce FX—is slated to arrive by February or March 2003 at the latest, according to Paul Ayscough, ATI's director of corporate marketing.

—Alexandra Krasne

NOTEBOOK PCs

A Notebook With a Split Personality

YOU'LL LOVE the Xentex Flip-Pad Voyager notebook if you have two things: an addiction to multiple-monitor computing, and a sturdy wheeled luggage cart. (Make that three things: You'll also need $5000.)

Think of this laptop as the logical conclusion to 2002's explosion of desktop replacements. The Voyager's selling points are its two 13.3-inch LCDs, which stand side-by-side in portrait mode. These dual screens can be used as a single huge display or as two independent monitors, and one screen pivots 180 degrees to make presentations easier. Interestingly, Xentex (www.xentex.com) is not the only manufacturer that looks at notebooks and sees double. A company called Estari (www.estari.com) is offering the 2-VU, a tablet computer with two screens.

Luggage cart or no, how do you carry a double-screen PC around? Good question. Xentex's solution is to make the notebook fold in ways anatomically impossible for most computing equipment. The screens close like a normal notebook, and then the whole contraption folds again along the center spine between the monitors. The resulting package is 14.5 inches long and 10.4 inches wide, similar to a large notebook's dimensions. But it's also 3.2 inches thick, and with its two batteries (which Xentex says support 4 hours of computing), it weighs a hefty 12 pounds. So oil the wheels on that luggage cart. And if you want to work on the plane, you'd better plan to buy two seats.

—Ed Albro ▶

WIRELESS NETWORKING

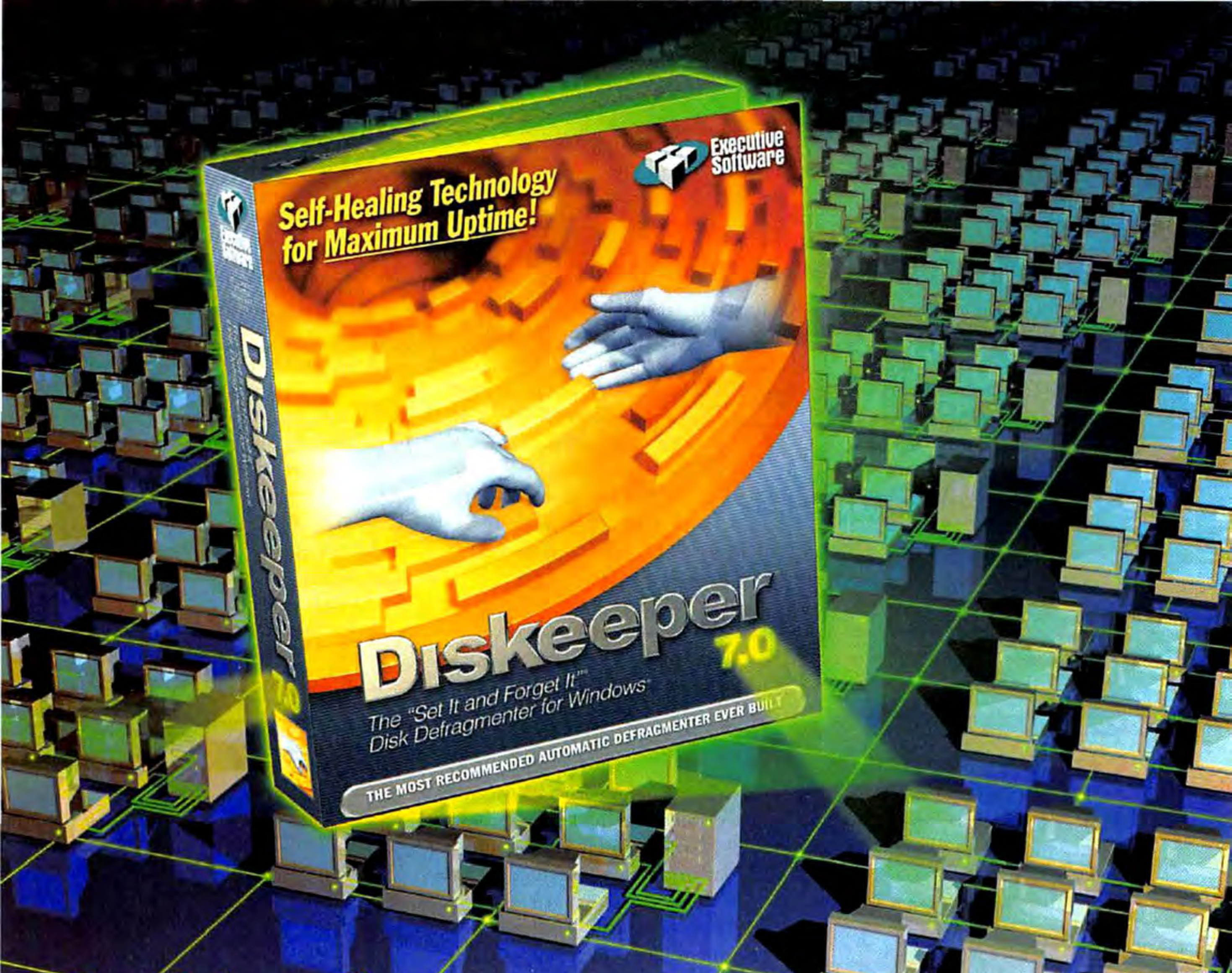
A LONG-DISTANCE WI-FI SOLUTION

IF YOU'RE TIRED OF waiting for fast mobile Internet access or live in a town where the homes are just too sparse to justify running the wires necessary for either cable or DSL broadband service, relief could come from an unlikely source: 802.11 wireless networks.

The ranges of Wi-Fi networks are usually limited to only about 300 feet. But San Francisco-based Vivato (www.vivato.net) has found a way to extend network range to more than four miles. How does Vivato do it? Typical Wi-Fi access points broadcast data in all directions at once. Vivato's system uses a special antenna to beam data requested by your PC to your PC only. Focusing that energy allows it to travel a much longer distance.

Vivato "Wi-Fi switches" are due out in the first quarter of 2003 and will initially be marketed to large enterprises that want to set up large-scale networks. But the company says its technology could easily be used to set up Wi-Fi networks on campuses or in an entire downtown. And researchers at Intel are using a similar arrangement to provide broadband Internet access to some employees in rural Oregon.

—Ed Albro


Executive Software
Self-Healing Technology for Maximum Uptime!
Diskeeper 7.0
The "Set It and Forget It" Disk Defragmenter for Windows
THE MOST RECOMMENDED AUTOMATIC DEFRAGMENTER EVER BUILT

Self-healing technology for MAXIMUM UPTIME...

Across your network, fragmentation is the underlying source of many system reliability and performance problems. Blue screens, crashes, delays, conflicts, long back-ups, and other errors...caused by as little as one fragmented file. Because it's impossible to regularly defrag all your servers and workstations *manually*, this basic cause of system instability remains.

Proactive system maintenance just got a heck of a lot easier! New *DISKEEPER® 7.0* automatic disk defragmenter exclusively offers *Smart Scheduling®* — self-healing technology that transparently monitors and repairs the files shattered across your disks. As Diskeeper runs in the background, self-adjusting to the exact needs of each machine, it will easily save your company time and money. More importantly, it will help *you* produce greater reliability and uptime—automatically. Put Diskeeper to work on your network today!

Executive Software®
Focused Development of System Management Tools

Call 800-829-6468, ext. 4220
Free! Download Diskeeper trialware at
www.diskeeper.com/pw9

New!
Freeware Download
If you're going to try a free defragmenter, why not have the best? Download Diskeeper Lite manual defragmenter for Windows® at:
www.diskeeper.com/pw9DKL

© 2002 Executive Software International Inc. All Rights Reserved. Diskeeper, Executive Software, the Executive Software logo, "Set It and Forget It" and "Smart Scheduling" are registered trademarks owned by Executive Software International Inc. Microsoft, Windows, and Windows NT are registered trademarks owned by the Microsoft Corporation. All other trademarks and brand names are the property of their respective owners.

TREND

LINUX WAITS IN THE WINGS

WITH BUSINESSES anxious to slash IT budgets, could 2003 be the year Linux finally makes a splash on the desktop? Add Linux's improved user-friendliness and Microsoft compatibility (particularly in networking and with Office) to its lack of licensing costs and use restrictions, and you've got a potentially winning combination.

The three big commercial Linux vendors–Red Hat, Mandrake, and SuSE–all shipped new editions of their Linux distributions in the waning months of 2002. Upstarts Xandros, Lindows, and Lycoris remain in the mix, too, focusing solely on end users. And Red Hat achieved an important advance toward desktop acceptance with version 8 of its distribution, tweaking the system so that point-and-click apps look and feel the same, under any of Linux's desktop environments. Look for other distributions to follow suit this year.

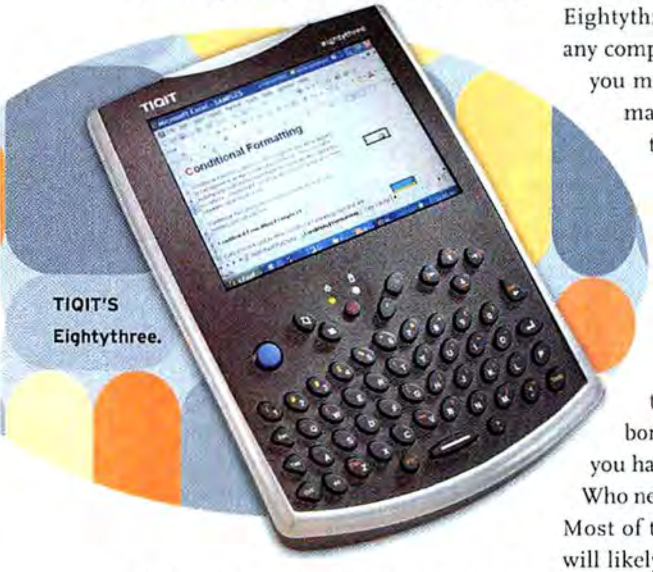
All of these companies have at their disposal the strongest building blocks yet produced by the open-source community. The KDE and Gnome desktop environments now sport most of the features that Windows users expect to see. For their part, OpenOffice.org's office suite and its commercial cousin, Sun's StarOffice, continue to improve. The Wine libraries (which enable Linux to run Windows programs) have Microsoft Office (though not Office XP) running on Linux. By the end of 2003, you'll probably see low-cost Linux-based PCs for sale at places other than Walmart.com, where you can currently pick up a Microtel PC running LindowsOS for $199.

–Matthew Newton

PORTABLE PCs

Lilliputian Computing

THESE DAYS, COMPUTERS come in more shapes and sizes than ever—PDAs, ultraportable notebooks, desktop replacements, all-in-one desktops, and towers of all descriptions. So do we really need a PC dressed in yet another form factor?



TIQIT'S Eightythree.

The makers of the Tiqit Eightythree think we do. The Eightythree is a fully functioning PC in a package not much bigger than a PDA. The device, priced between $1000 and $1500, should be available in the first quarter of 2003. It has a built-in 4-inch-diagonal, 640-by-480 screen and a thumb keyboard. With a 300-MHz National Semiconductor Geode processor, 256MB of SDRAM, and up to a 20GB hard drive, the Eightythree can run Windows XP and any compatible applications—though as you might expect, application performance wasn't exactly snappy on the preproduction unit we tried.

The screen is touch-sensitive, and you can use handwriting recognition to enter data. You can also attach a USB keyboard and an external monitor (with an included dongle), thus transforming the Eightythree into a barebones desktop machine whenever you have a desk to put it on.

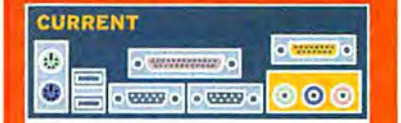
Who needs a near-PDA-size computer? Most of the first batch of Eightythrees will likely go to people who are in specialized professions or in the military, according to Tiqit executives. But if it gets a speedier processor, this tiny computer could make sense for people who want to take all their data and applications with them wherever they go.

—Ed Albro

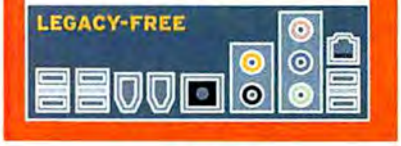
TREND

Disappearing Ports and Drives

IF YOU BUY a new PC this year, you may notice that a few things are missing. That's because PC makers are beginning to phase out older components such as parallel, serial, and PS/2 ports. So-called legacy-free PCs have appeared before. But now CD-RW drives are cheap and widespread enough that Gateway's Profile PCs and Dell's OptiPlex SX260 come sans floppy drive. Motherboard vendor Abit omits parallel and serial ports on its AT7 and IT7 boards in favor of FireWire, USB 2.0, and digital sound connectors. *–Eric Dahl*



Parallel and serial ports (top center) disappear, making room for digital sound connections and LAN ports (bottom right). Eventually, PS/2 keyboard and mouse ports (top left) will be replaced by USB 1.1, USB 2.0, and FireWire connectors (bottom left).



PHOTOGRAPH: MARC SIMON

Maximum Power! Minimum Space!

Desk-Bottom or Vertically Mounted with Optional Bracket

"Powerful, Sharp-Looking PC"
—*PC World*

SleekLine® Pentium®4 Computers start at only $999.

That's right! A SleekLine 2000 with a 2GHz Pentium4 processor, 256MB DDR memory, and a 40GB 7200RPM drive is only $999. Need more power? No problem. SleekLine is the *only* space-saving PC that doesn't sacrifice performance. With upgrades that include a 2.8GHz P4, 2GB DDR, and *two* 120GB drives, your SleekLine will blow away high-end PCs 4x its size!

SleekLine® Systems

The *only* PCs you can mount, rack or stack.™

www.sleekline.com 5995 Avenida Encinas, Carlsbad, CA 92008 (800) 722-6555

Made in the USA. Includes 3-Year Warranty and Free 24/7 Support. SleekLine is a Division of PC Power & Cooling®, Inc. Est. 1985

Pricing and performance details available on website. SleekLine is a reg. trademark of PC Power & Cooling, Inc. Specs subject to change without notice. ©2002

Unmatched Versatility

INDUSTRIAL APPLICATIONS

SleekLine® Systems are available with mounting brackets for installation in a 1U 19" rack. With dual Ethernet, SCSI, and 1GB/2GB memory options, SleekLine makes a great workstation or file server.

MOBILE COMPUTING

A 12VDC input power supply option gets SleekLine out of the office. You'll have performance and mass storage (that far exceed a laptop) in your car, RV, or boat.

HOME ENTERTAINMENT

SleekLine's stylish looks and compact size make it ideal for a home entertainment cabinet. Features Intel® Extreme Graphics, front panel USB 2.0, 10/100 Ethernet, and is available with AGP digital and S-video out, and a fast DVD/CD-RW combo drive.

OFFICE SPACE

SleekLine computers offer a centralized solution for crowded office cubicles. Reclaim valuable working space by replacing up to 12 mid-towers with a 2 sq. ft. stack of space-saving SleekLines. (Each measures 15.5"W x 17"D x 1.75"H)

PC GAMES

We're All Doomed

NINE YEARS AFTER the original Doom put its indelible mark on PC gaming, Id Software is readying the next chilling installment in the series, Doom 3. The game, expected to arrive before summer, reaches several milestones in computer gaming and promises to deliver some of the most amazing 3D graphics ever seen on a PC.

The original Doom was supposed to be scary, but back in the days of 256 colors and 320-by-240-pixel screens, developers could do only so much. Nine years later, PC graphics have advanced to the point where the original vision for Doom can become a reality—and a frightening reality it is. The game will be one of the first designed with graphics chips like NVidia's GeForce as a minimum requirement, and it will be one of the first made to work with Microsoft's upcoming DirectX 9 application programming interface.

Early demos of the game have displayed stunning effects (see above). For example, Doom 3's lighting is entirely dynamic, so you could shoot out all the lights in a room and create total darkness. Just be ready for a scare if you do—all of Doom 3's monsters can see in the dark.

—Eric Dahl

NOTEBOOKS like Toshiba's Portégé 3500 look like normal laptops, but with a twist and flip of the screen, they're tablet-ready.

TABLET PCs

Tablet PCs Get a Boost From Microsoft

TABLET-STYLE PCs have come a long way since the bulky Gridpad of the late 1980s. The November 2002 debut of Microsoft's Windows XP Tablet PC Edition have helped revive the concept of computing with a stylus rather than a keyboard and mouse. The handwriting recognition in these new tablets is greatly improved, and Microsoft claims that future Tablet PCs won't carry the 10 to 20 percent price premium that is attached to current models.

Tablet PCs (or slates) have already found a home in the health care industry, in warehouses, and in other special applications, but the key for success will be sales to businesses. Slates available now, such as the $1699 HP Compaq Tablet PC TC1000 (find.pcworld.com/31694) and the $2199 Fujitsu Stylistic ST4000 (find.pcworld.com/31685), come with ports for connecting keyboards and docking stations. The $2199 Acer TravelMate C100 (find.pcworld.com/31682) and the $2299 Toshiba Portégé 3500 (see left) look more like conventional notebook PCs, but with screens that twist around and lie flat on the keyboard to work as a tablet. Go to find.pcworld.com/32048 for last month's review of three slate tablets and two convertible notebooks.

—Dennis O'Reilly ■

TREND

RECYCLING FEES ON HOLD AS PCS GET GREENER

SOMEDAY, EVERY computer purchase may include a charge of $10, $20, or more to pay for safe dismantling after the PC has processed its last byte. But not yet. Conservationists, legislators, and PC vendors continue to wrangle over who should pay to clean up the lead, mercury, and other toxins in discarded PC components such as cathode-ray tubes and motherboards.

It will take months to resolve such questions as how to finance and monitor the recycling of old computers, and at what point in a product's life cycle a recycling fee should be applied. This summer the Japanese government will extend its current compulsory recycling program for business computers to all PCs (with consumers picking up the tab); meanwhile, some European countries are putting the onus on PC manufacturers to pay for the safe disposal of their products. PC vendors in this country believe that consumers would balk at even a modest recycling fee tacked onto the price of their new systems.

Ironically, future systems bearing a PC recycling fee will likely include far fewer potential pollutants than current models: LCDs don't contain the pounds of lead that CRTs do, and manufacturers are reducing or eliminating the amount of other toxins in new PC components. Go to find.pcworld.com/32051 for more on PC recycling.

–Dennis O'Reilly

0:08:32
09.14.02
0.02.02
DIRECTOR'S CUT
CAPTURE
CREATE
PREMIERE
0.03.22
0.08.32
0.17.45
indiDVD
TDK®

With a TDK Indi DVD burner and DVD recording media, creating videos and photo slideshows is simple and fun. Add music, narration and sound effects to give your Big Footage a fresh cut. Quickly create your own Hollywood style DVD, back up data and more. Records DVD and CD discs.

Discover the whole Indi DVD story at www.tdk.com, The Digital Sweetspot™.

Indi is a registered trademark of TDK Electronics Corporation. All other brands and products are trademarks of their respective holders.

TDK
DVD R
TDK

image

BY PAUL JASPER AND DAN LITTMAN

THE HP Photosmart 7550 (left) and the Canon I550 Color Bubble Jet Printer.

makers

Canon
i550
East
West
North

You can pay a little or a lot for a photo-capable printer. Our lab tests of 16 new models uncover the real values.

In the same way that digital cameras have revolutionized how we take pictures, ink jet printers have revolutionized how we print them. Gone are the days of waiting two weeks for a reprint or an enlargement. Now you simply turn on your PC and load some glossy paper into your ink jet printer. In 5 minutes, you have an image that rivals anything produced by your neighborhood photo lab.

We looked at 16 ink jet printers from Canon, Epson, Hewlett-Packard, and Lexmark. Of these, we classified 7 as general-purpose models, with prices ranging from $79 to $200 and features appropriate for home and small-office use. Such printers work well for printing text and graphics files, as well as the occasional photo. ▶

PHOTOGRAPH BY PETE McARTHUR

The other nine printers, designed with the digital photographer in mind, are a bit pricier, ranging from $149 to $699. Most of the photo printers we tested use six or more colors of ink to provide subtler shading in continuous tones; the exceptions are Canon's I850 Photo Printer and S530D Direct Connect Photo Printer, which use the standard four inks. Some printers, such as the HP Photosmart 7550 and the Canon S530D, have slots that can accept your camera's flash-memory card, or they let you use a USB cable to bypass your computer and print shots directly from your camera. HP's Photosmart 7550 bundles a small LCD screen like the one on your digital camera that allows you to preview images and perform rudimentary adjustments before printing. Some of the models we tested, including the Canon S530D and the HP Photosmart 7550, don't come with USB cables, so check the box to determine whether the supplies you need are included.

Photo Printer

#1 EPSON'S STYLUS PHOTO 2200 prints pictures with intense colors and lifelike detail. It accepts 13-inch-wide paper and roll paper, too.

In our image quality tests, Epson's Stylus Photo 2200 surpassed its competition to earn our Best Buy award in the photo printer category. At $699, it costs more than any other photo printer on our chart, but it produced color photographs and gray-scale images that went above and beyond those of the other printers we reviewed. The 2200 also has plenty of extra features, such as wide-format printing (up to 13 inches wide and 44 inches long) and a FireWire port, and it was the only model we reviewed that came with a USB 2.0 high-speed port. The Best Buy on the general-purpose chart, the Canon I320 Color Bubble Jet Printer, is the least-expensive model we reviewed

PHOTOGRAPH: RICK RIZNER

FEATURES COMPARISON

TEST Center Top 10 Ink Jet Printers

	PHOTO INK JET PRINTER	Street price (10/26/02)	Overall rating	Tested speed for monochrome text/ color photo '(ppm)	Maximum resolution (dots per inch)	Print quality for monochrome text/ color graphics	Print quality for photos	Cost per cartridge, black/color
1	Best BUY Epson Stylus Photo 2200 ★★★★☆ find.pcworld.com/32093	$699	**89**	2.9/0.2	2880 by 1440	**Good/Fair**	**Outstanding**	$12/$12
2	Canon I850 Photo Printer ★★★½☆ find.pcworld.com/32096	$199	**89**	7.7/0.8	4800 by 1200	**Very good/Good**	**Good**	$14/$12
3	Epson Stylus Photo 960 ★★★★☆ find.pcworld.com/32099	$349	**88**	2.5/0.5	2880 by 1440	**Good/Fair**	**Outstanding**	$12/$12
4	Canon S530D Direct Connect Photo Printer ★★★★☆ find.pcworld.com/32111	$199	**87**	6.5/0.8	2400 by 1200	**Very good/Good**	**Good**	$14/$12
5	HP Photosmart 7550 ★★★½☆ find.pcworld.com/32102	$299	**85**	4.2/0.3	4800 by 1200	**Good/Very good**	**Very good**	$36/$35
	GENERAL-PURPOSE INK JET PRINTER							
1	Best BUY Canon I320 Color Bubble Jet Printer ★★★½☆ find.pcworld.com/32105	$79	**88**	4.7/0.5	2400 by 1200	**Good/Good**	**Good**	$8/$19
2	Canon I550 Color Bubble Jet Printer ★★★½☆ find.pcworld.com/32108	$149	**88**	7.3/0.8	2400 by 1200	**Good/Good**	**Good**	$14/$12
3	HP Deskjet 3820 ★★★☆☆ find.pcworld.com/30821	$99	**76**	4.1/0.4	1200 by 1200	**Very good/Good**	**Good**	$30/$35
4	Epson Stylus C62 ★★★☆☆ find.pcworld.com/30827	$99	**75**	6.2/0.3	5760 by 720	**Fair/Fair**	**Good**	$30/$30
5	Lexmark Z55se Color Jetprinter ★★★☆☆ find.pcworld.com/30830	$115	**74**	6.4/0.2	4800 by 1200	**Good/Good**	**Fair**	$30/$35

HOW WE TEST: The PC World Test Center ran time tests for each printer from a 1.6-GHz Pentium 4 PC with 256MB of RAM and Windows XP Home. All the printers were connected to our test PC via a USB 2.0 adapter. In addition, for each printer, the PC World Test Center printed monochrome text and line art, and color and gray-scale photo samples using manufacturer-recommended paper and inks; a panel of judges rated their quality. We used plain paper for all nonphoto tests and vendor-recommended settings and paper for photos. Photo printers are ranked according to speed (10 percent), output (37 percent), price (5 percent), ease of use (14 percent), features (20 percent), support policies (7 percent), and cost of ink (7 percent). General-purpose printers are ranked by speed (10 percent), output (20 percent), price (25 percent), ease of use (15 percent), features (15 percent), support policies (10 percent), and cost of ink (5 percent).

for this article. The I320 competently prints text, photos, and graphics, and though it doesn't have exceptionally fast print speeds, its $79 price tag and inexpensive ink cartridges make it an economical choice.

TESTING INK JETS

THE PC WORLD TEST CENTER ran time tests for each printer from a 1.6-GHz Pentium 4–based PC equipped with 256MB of RAM and running Windows XP Home. All the printers were connected to the test PC via a USB 2.0 adapter. The Test Center printed out monochrome text, line art, and color and gray-scale photo samples for each printer. For photo printing, we used each manufacturer's recommended paper, settings, and inks. We used plain white paper and default settings for all nonphoto tests.

PHOTOGRAPH: RICK RIZNER

Photo Printer

# 2 THE CANON I850 prints photos on a budget. It's a good choice if you want your photo-printing machine to double as a home-office printer.

A panel of judges rated the image quality of output samples. We timed how long each unit took to produce prints, and in calculating overall ratings we factored in price, ease of use, features, support policies, and cost of ink.

You might expect photo printers to be faster at printing photographs. But the results of our speed tests showed that general-purpose units produce photos at about the same rate that photo printers do. The general-purpose ink jets averaged about 0.43 pages per minute when printing our 5-by-7-inch test photo, while the average output of the photo printers was a slightly faster 0.51 pages per minute with the same file. (That's too small a difference in speed to be very noticeable in everyday printing.) In our tests, the Canon models printed photographs faster than the printers from other ▶

Vendor-estimated page yield per cartridge, text/color (cents)	Number of ink colors/ink cartridges	Features	Comments
628/440	7/7	Parallel port, FireWire port, USB 2.0 port; maximum width of 13 inches; roll-paper holder; black pigmented ink	Designed for serious photographers, Epson's Stylus Photo 2200 printed the most detailed photos with the most accurate colors of all the printers we reviewed here.
695/385[2]	4/4	Parallel port, USB 1.1 port	Fastest photo printer is a good choice for budget-minded photographers, but photos could be more vivid. Ties the Canon S530D for the least-expensive photo printer on the chart.
630/440	6/7[3]	Parallel port, USB 1.1 port; roll-paper holder and automatic cutter included; three separate paper paths	Midpriced Epson model produced the second-best-looking photos of our test group.
695/385[2]	4/4	Two USB 1.1 ports (one proprietary USB 1.1 port allows direct printing from Canon cameras); PC Card slot with adapter for CompactFlash, SmartMedia, Memory Stick, SD Card; optional preview LCD monitor	Produced nice photos and clean text. Skin tones looked relatively accurate in photos but a bit washed out.
No data available/ 125 (4-by-6-inch pages)	6/3	Parallel port, two USB 1.1 ports; color LCD preview screen; black pigmented ink; direct printing from HP cameras; automatic paper sensing	Details in our test photo were sharper than in the original image. Highest per-page costs on the chart, but long-lived inks can last up to 70 years under glass without fading.
300/170	4/2	Parallel port, USB 1.1 port	Least-expensive model here prints clean and clear text, plus fairly accurate skin tones in slightly washed-out photos.
740/490[2]	4/2	Parallel port, USB 1.1 port	An excellent, fast, all-purpose performer. Colors in photos looked accurate but slightly washed out.
495/450	4/2	Parallel port, USB 1.1 port	Text was clear, but it could have been denser. Photos looked brighter and more detailed than our original image; one of the images had a blue cast.
420/300	4/2	Parallel port, USB 1.1 port	Details in photos were impressive with excellent transitions. Skin tones appeared a little too pink.
600/450	4/4	Parallel port, USB 1.1 port	We liked this printer's black, clear text and fast printing speeds, but skin tones looked ashen in our test photos.

[1] Test photo is a 5-by-7-inch, 2929-by-2092-dpi color print.
[2] Average yield of color cartridges.
[3] Only six inks can be used simultaneously.

manufacturers did, with the Canon S530D topping the ratings at 0.77 pages per minute on our test photo.

On graphics files and on mixed text-and-graphics files, the photo printers again displayed a slight speed edge that would not be especially noticeable during real-life use. The fastest model overall on our chart was the Canon I850 Photo Printer, which cranked out text at 7.7 pages per minute and printed our test photograph in 75 seconds.

Only in our timed text-printing test did the photo printers in our roundup trail the general-purpose models: The general-purpose printers produced text documents at an average speed of 5.6 pages per minute, versus an average of 3.6 pages per minute for the photo printers. However, the text from the photo models appeared darker and crisper.

Photo Printer

#3 THE EPSON STYLUS PHOTO 960 creates superb glossy photos. It has excellent paper handling, with a feeder for paper rolls.

The general-purpose models turned out pleasing pictures, but the specialized photo printers—especially the models that use more than four ink tanks, like the seven-ink-tank Epson Stylus Photo 2200—printed the best-looking photographs, with smooth gradations, accurate colors, and realistic skin tones. With seven ink cartridges installed simultaneously (two of which hold the same type of black ink), the Epson Stylus Photo 960 earned a photo quality rating of Outstanding, producing photos that were nearly identical to the original test images. The HP Photosmart 7550 printed superb pictures, but fell short of the quality we saw in photo prints from the top printers on our chart. Interestingly, details in photos printed on the Photosmart 7550 actually appeared sharper than in the original image.

Prints from general-purpose models lacked ▶

PRINTER EXTRAS

Fancy Photo Printers Offer Extra Features at Your Fingertips

ALONG WITH THEIR SPECIALIZED INKS, many photo printers come with an extra measure of convenience, in the form of controls that you can use from the printer's front panel instead of within the driver. This means you don't have to wait for your PC to power up to print your photos.

HP's Photosmart 7550 is the example shown here, but most of the photo printers we reviewed provide some combination of these conveniences or similar ones, and lower-priced models offer several of them—such as LCD preview screens and media slots—as extra-cost options.

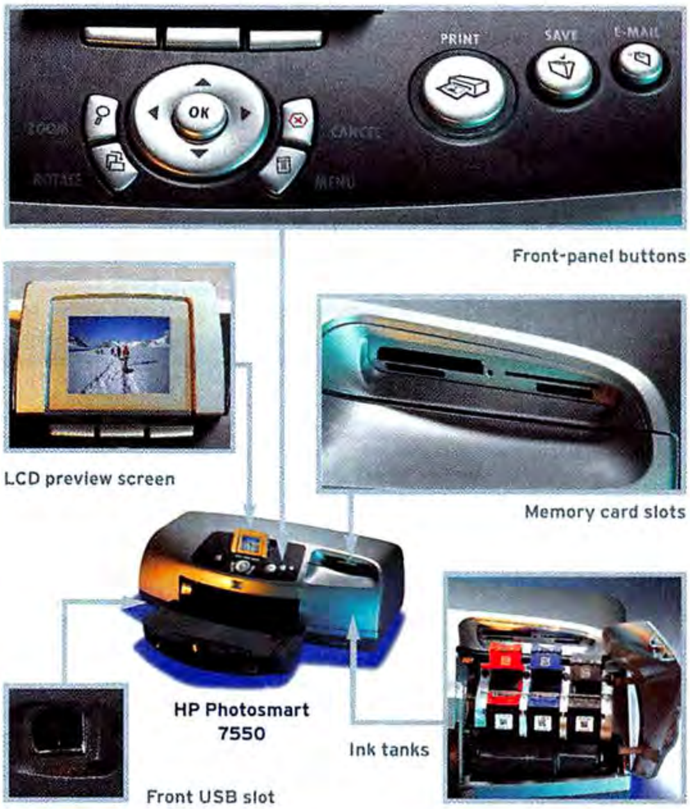
Front-panel buttons let you do things like select shots, zoom, and send photos to e-mail.

An LCD preview screen lets you see what you're printing. HP puts menus on this screen, too.

Memory card slots can read flash-media formats such as Memory Stick, Secure Digital, and CompactFlash directly from the printer.

Additional ink tanks like the three in the Photosmart 7550 allow you to use more colors: This HP holds photo, standard-color, and text-black cartridges simultaneously.

A front-mounted port lets you print images directly from a digital camera; HP's USB port works only with the company's own digital cameras.



PHOTOGRAPHS: RICK RIZNER

They'll love what they see.

You'll love what you save.

DELL 3100MP
DLP

Dell | Small Business

Dell™ 3100MP Projector

Light and Powerful Micro-Portable Projector

- Lightweight, Compact Design: 3.5 lbs and 2.2" Thin
- Super Bright 1,050 ANSI Lumens[3] (Max)
- Native XGA (1024 x 768) Resolution
- Auto Synch to UXGA (1600 x 1200)
- Integrated Zoom Lens and Keystone Correction
- Supports NTSC, PAL, SECAM
- HDTV Ready (480p, 480i, 720p and 1080i)
- Composite, Component and S-Video Capability
- Supports Analog and DVI Digital Input
- Includes Hard Case and Remote Control with Laser Pointer
- Built-in 2 Watt Amplifier and Speaker
- 2-Yr Advanced Exchange Service[4] Standard

$2299 as low as **$66**/mo., (46 pmts[2])
60 Days Same-As-Cash
SKU: PROJ2

Meet the 3.5 lbs, 2.2" micro-portable projector from Dell. The 3100MP is the kind of projector that makes it affordable to wow them in the conference room and lighten the load in your briefcase. It delivers crisp images and sharp presentations, and even works with TV and video inputs, so you have more ways to put on a deal-clinching show. And, it comes with the service and support only Dell can deliver at a price you won't believe. The Dell 3100MP. The more places you take it, the more places it can take you.

"An Overall Rating of Excellent"
Dell 3100MP
Dell Computer Corporation
June 19, 2002

PC MAGAZINE
www.pcmag.com

Do more. Carry less. **Easy as DELL™**

Click www.dell.com/projector Call 1-877-339-3355
toll free

Call: M-F 7a-8p Sat 8a-5p, CT

Pricing, specifications, availability and terms of offer may change without notice. Taxes and shipping charges extra, and vary. U.S. new purchases only. Dell cannot be held responsible for errors in typography or photography. [2]Monthly payment based on 48-month QuickLoan at 12.99% interest rate for qualified Small Business customers. Your interest rate and monthly payment may be same or higher, depending on your creditworthiness. Minimum transaction size of $500 required. Maximum aggregate financed amount not to exceed $25,000. Under 60 Days Same-As-Cash QuickLoan, interest accrues during first 60 days after QuickLoan Commencement Date (which is five days after product ships) if balance not paid within these 60 days. OFFER VARIES BY CREDITWORTHINESS OF CUSTOMER AS DETERMINED BY LENDER. Taxes, fees and shipping charges are extra and may vary. Not valid on past orders or financing. QuickLoan arranged by CIT Bank to Small Business customers with approved credit. [3]Based on ANSI/NAPM IT .228-1997 tests of 34 units, March 2002, with average ANSI Lumens 941. Brightness degrades with usage. Dell recommends replacing your bulb after 1000 hours of usage. [4]Replacement system or replacement part will be dispatched, if necessary, following phone-based troubleshooting, in advance of receipt of returned defective system. Defective unit must be returned. Replacement may be refurbished. Bulbs have a 90 day limited warranty. Availability varies. Other conditions apply. Dell, the stylized E logo, E-Value and Dell 3100MP Projector are trademarks of Dell Computer Corporation. PC Magazine 5-Star Award Logo is a trademark of Ziff Davis Publishing Holdings Inc. Used under license. ©2002 Dell Computer Corporation. All rights reserved.

GO
Online For
Latest Prices
and Weekly
Promotions

the rich skin tones and smooth gradations we saw in output from photo printers, but we rated the photo quality from most of them as Good. One exception was the Lexmark Z55se Color Jetprinter, whose photos showed visible graininess, washed-out colors, and ashen skin tones; we rated it Fair.

Visit find.pcworld.com/32168 for in-depth reviews of the 16 printers we tested for this article.

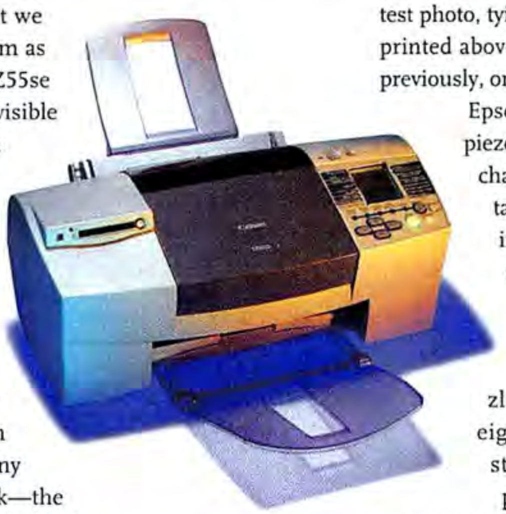


Photo Printer

# 4 THE CANON S530D is a capable photo printer, but it doesn't offer the subtle details of a six-color model. Its lovely black text makes it a suitable office printer.

DROPS FROM MANY NOZZLES

ALL INK JET PRINTERS have a printhead that travels across the page, laying down a fine spray of ink droplets. Between sweeps of the head—which contains many nozzles, each firing a single color of ink—the paper advances through the printer. Though all ink jet printers share this technology, the various manufacturers have introduced their own twists.

Hewlett-Packard's printers use thermal ink jet technology, in which heat is applied to expel droplets of ink from microscopic nozzles in the printheads. Those heads use just one size of nozzle, producing a single size of droplet.

The Canon I850 Photo Printer has dual sets of nozzles that produce two different droplet sizes. Canon product manager John Lamb explains that the I850's novel printhead configuration lays down black first and then color, always leading with cyan, following with magenta, and ending with yellow. The black nozzles are offset, improving contrast by layering black ink under the color ink. In our tests, the Canon units we reviewed took top scores for speed; their photo image quality was good, but not outstanding.

Photo Printer

# 5 HP'S PHOTOSMART 7550 doesn't need a PC to print photos from a digital camera. Instead, connect the camera to the USB 1.1 port on the printer's face.

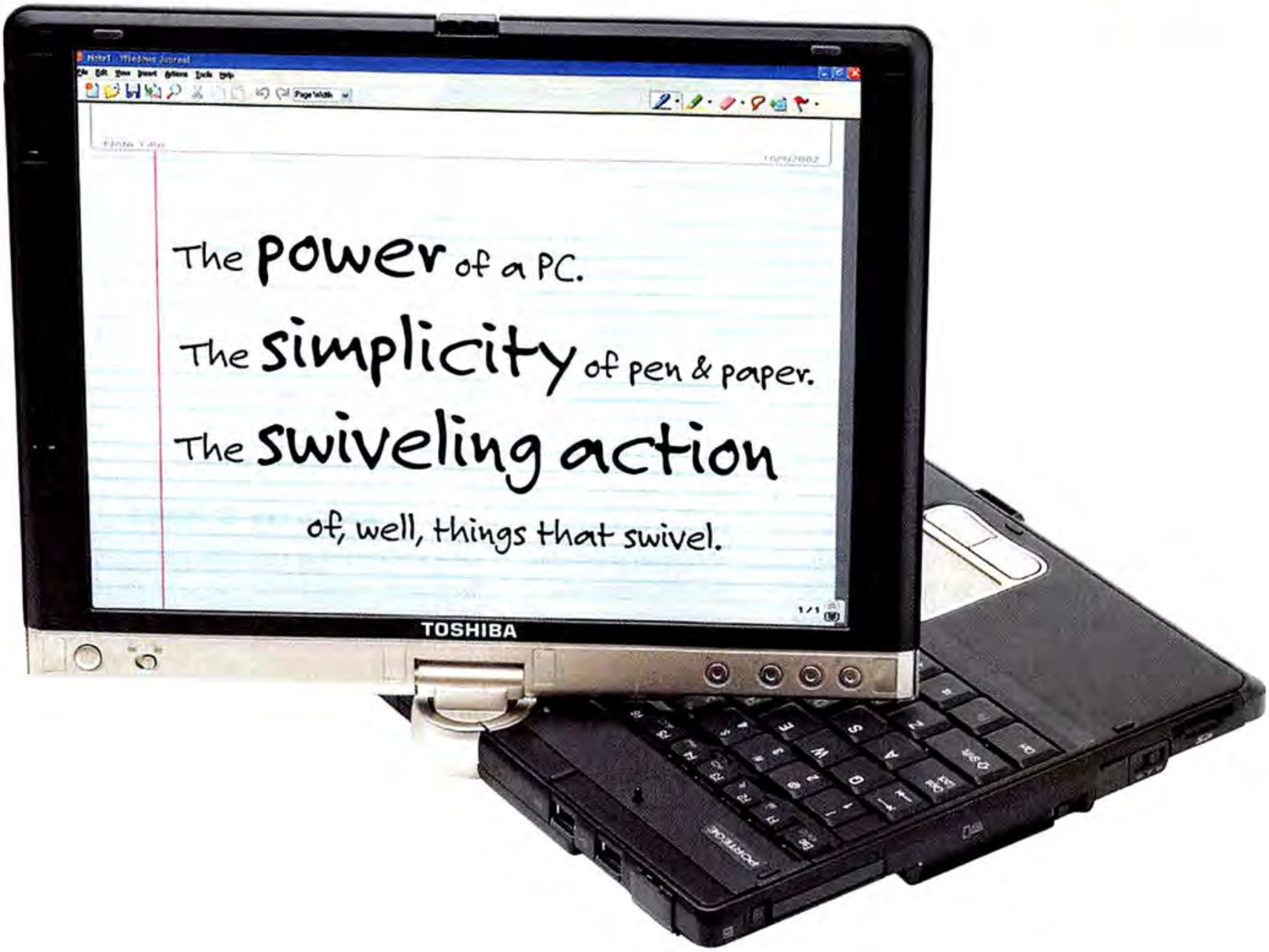
Like HP and Canon, Lexmark uses thermal ink jet technology in its printers. The Lexmark printheads have 3-picoliter nozzles for detail and 10-picoliter nozzles for speed (3 picoliters is equivalent to 3 billionths of a liter). Printers from Lexmark put down either black or color ink each time the printhead travels across the page. This allows for more ink-drying time than with printers that put down all four colors in one pass. However, this process also doubles the number of printhead passes, which slows down printing. The only Lexmark model we tested, the Z55se Color Jetprinter, produced text at a respectable 6.4 pages per minute, but it took almost 5 minutes to print our test photo, tying for last place in our test group. It printed above-average-looking text but, as noted previously, only adequate photos.

Epson printers use a proprietary micropiezo technology to fire ink. An electrical charge is applied to a piezoelectric crystal to pull, and then push, the ink within the nozzle. By varying the strength of electrical charges, the technology causes different-size ink droplets to break away from the nozzle. This enables Epson to use nozzles of a single size to produce up to eight different droplet sizes. We saw strong photo quality from Epson's printers, and its two photo models were especially impressive. On text, monochrome line art, and gray-scale photos, though, Epson printers received less-than-stellar quality scores.

EVENTUALLY MY PRINTS WILL COME

BECAUSE OF THE LARGE amount of data that is transmitted during photo printing, images can seem slow to print. Using a USB interface rather than a parallel port can minimize the wait, but other factors—including the printer's engine speed, its amount of memory, and the speed of your computer—also affect how rapidly documents and photos print. At this point, relatively few printers use the USB 2.0 or FireWire interfaces—most printers still aren't fast enough to take advantage of the additional bandwidth that those standards provide. Be sure to read the fine print when you see USB 2.0 on a printer's box: Most of the time when you look closely you'll see that it says "USB 2.0 Full Speed," which is just a new name for USB 1.1. Of the models we tested, only the Epson Stylus Photo 2200, which also has a FireWire port, supports the faster USB 2.0 High Speed (we refer to USB 2.0 High Speed as USB 2.0 and USB 2.0 Full Speed as USB 1.1). Despite having the fastest interface, the Epson Stylus Photo 2200's text printing speed of 2.9 ppm and photo print speed of 0.2 ppm lagged behind the performance of many models equipped with the slower USB 1.1 port, including Canon's I850 Photo Printer, the overall speed leader. We noticed that the printers delivering ▶

PHOTOGRAPHS: RICK RIZNER



Introducing the Portégé® 3500. It's a notebook. It's a tablet. It's innovative engineering at its most versatile. Use it as a notebook with a fast Mobile Intel® Pentium® III Processor - M @ 1.33GHz, generous 12.1" diagonal color screen, large memory capacity and integrated Wi-Fi wireless technology. Then swivel the display, and it's a tablet. Write on the screen with a digital pen to take notes or add handwriting to a document. Plus, it includes Microsoft® Windows® XP Tablet PC Edition Operating System for maximum power and portability.

TOSHIBA

1-888-488-2835 | toshiba.com

Toshiba recommends Microsoft® Windows® XP Professional for mobile computing.

©2002 Toshiba America Information Systems, Inc. Portégé is a registered trademark of Toshiba America Information Systems, Inc. Intel, the Intel Inside logo and Pentium are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States or other countries. Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries. All specifications, software and availability are subject to change. All rights reserved.

the best photo quality tended to be slower. Obviously, patience is still a virtue when it comes to printing photos.

DOTS BEFORE YOUR EYES

IF YOU LOOK VERY CLOSELY, you can make out the minuscule dots on a page from an ink jet printer, but usually your eye picks out only the patterns created by the ink droplets. Ink jet printers create those patterns by using halftoning, the same process used to create photographs in newspapers and magazines. Dots of different colors are arranged to appear as continuous color tones. The smallest droplets that the ink jet printers in our tests produced ranged between 6 and 2 picoliters (see "Tiny Droplets Form a Big Picture," page 116).

Most general-purpose printers use four basic ink colors: CMYK, or cyan (blue), magenta (red), yellow, and black. The Canon S830D, Epson's Stylus Photo 825, Stylus Photo 925, and Stylus Photo 960, and the HP Photosmart 7550 use six colors at once, adding a light magenta and a light cyan to the CMYK mix. The Epson Stylus Photo 2200 uses seven ink tanks at once (the seventh color is light black, designed to improve subtle shades and contrast in photos).

The light cyan and light magenta colors help photo printers produce smoother gradations and less-visible dot patterns in very light areas. A light yellow is unnecessary, since individual dots of regular yellow are almost imperceptible to the human eye, according to Canon's Lamb. Four-color printers that can produce variable-size droplets (such as those from Canon, Lexmark, and Epson) approximate the effect of light cyan and light magenta with smaller ink droplets.

Best BUY

General Printer

#1 THE CANON I320 COLOR BUBBLE JET is $20 less than other ink jets we tested, yet it turns out bright, subtly textured photographs and clean text.

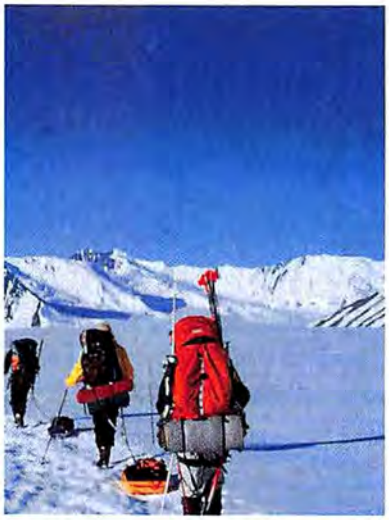
MATCH INK TO PAPER

ALTHOUGH IT MAY SEEM like just one more way for printer manufacturers to separate you from your money, making sure that you use the ▶

OUTPUT SHOWDOWN

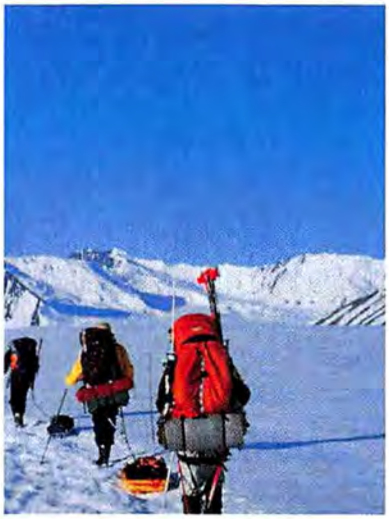
Should You Let a Professional Print Your Digital Photos?

WHEN YOU WANT something done right, often the best thing to do is hire a professional. To see whether a professional photo processor could make a better 8-by-10-inch print of our digital photo than we could, we sent it to Ofoto, and we printed it using general-purpose and photo printers. We found Ofoto easier to use than the printers, but we didn't like waiting to get our prints. The Ofoto picture was better than the print from the HP 5550 (which missed our chart), but not as good as the Epson Stylus Photo 960's print.



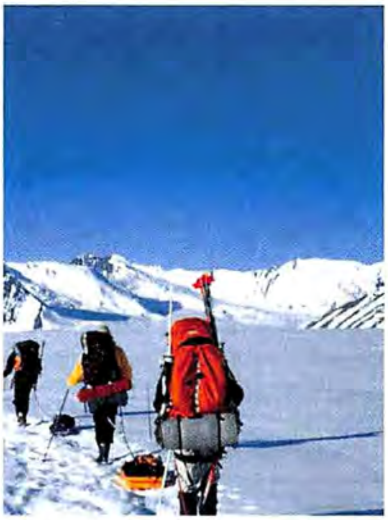
HP Deskjet 5550

Four-color printers often have trouble blending colors (print cost: 71 cents).



Epson Stylus Photo 960

Six ink colors help render transitions in the horizon (print cost: 83 cents).



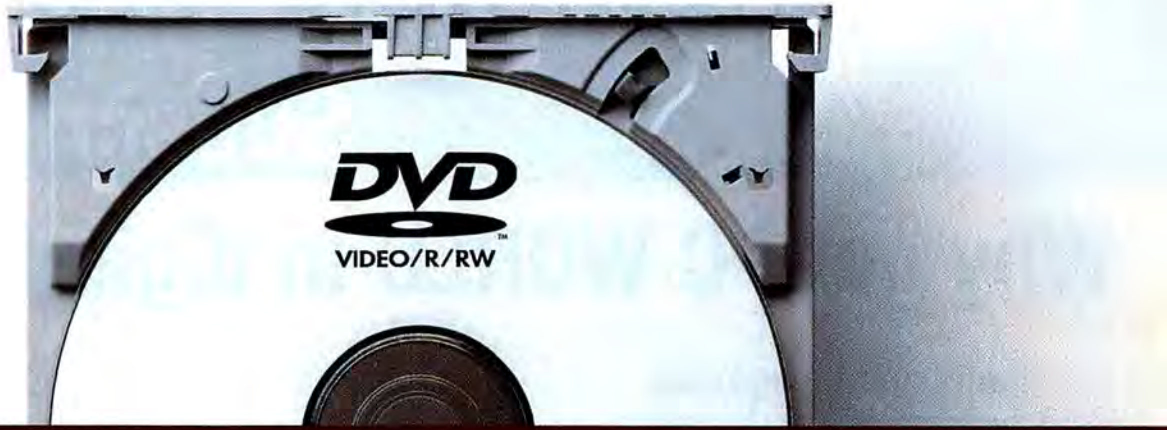
Ofoto

Lacks detail that the photo printer provided (print cost: $3.99, plus $1.49 S&H).

PHOTOGRAPHS: RICK RIZNER (TOP); TRACEY CAPEN (BOTTOM)

Pioneer sound.vision.soul

pioneerelectronics.com



A recordable DVD format that is already accepted by millions.

The time has come for recordable DVD. Now that you're ready to archive your home movies on DVD and toss those old VHS tapes, you want to make sure that you're choosing the best technology for the job. Join the millions of people who have already chosen DVD-R and DVD-RW to record and archive their own videos with crystal-clear DVD quality.

DVD-R is THE most compatible format. Let's face it, recorded DVDs are most valuable when you can play them back on other DVD players or computer drives. A recent test conducted by *Digital Video Magazine* indicates that DVD-R discs are more likely to play back on other DVD players than any other format of recordable disc tested. And with the price of blank DVD-R media typically being much lower than other formats, recording is also affordable. So if you want to burn a disc and then be able to share it with friends and family, this is the technology you'll want to use.

Pioneer DVR-A05

Pioneer DVR-7000

DVD-R and DVD-RW are the gold standard. DVD-R and DVD-RW have become the de facto standard for DVD recording with millions of products already in use. DVD-R has been used throughout the professional video and entertainment industries for years and computer manufacturers like Sony® and Compaq® are currently offering DVD-R/RW drives in their latest line of products. Apple® also made the move to install DVD-R drives in many of their new machines.

Why is the DVD Forum important? The DVD Forum was originally formed to create the DVD Video standard. Now, the group that made DVD possible has taken it to the next level, bringing together consumer electronics and computer manufacturers with blank media companies to set the standard for recordable DVD. The DVD Forum approved DVD-R and DVD-RW as official DVD recording standards. Don't settle for imitations. If you want genuine DVD recording, look for the official DVD-R/RW logo.

What are you waiting for? Whether you want to create a DVD of your wedding, a recent family vacation or your child's first piano recital, DVD-R/RWs offer just what you need to burn a disc that can be shared with friends and family. Now is the time to get started. For more information, go to www.pioneerelectronics.com.

DVD Format Comparison	DVD-R/RW	+R/+RW
DVD Forum-approved Format	YES	NO
Original Equipment Drive Manufacturers	Pioneer Panasonic Hitachi LG Toshiba	RICOH
Drives shipped to Market (projected Q4 2002)[1]	3,284,000	1,490,000
Formally supported by DVD Player and ROM Drive Manufacturers[2]	68%	<5%
Compatibility with Existing Players[3]	DVD-R 88% DVD-RW 65%	+R - NA +RW -59%

1. Source: Techno Systems Research
2. Source: Pioneer Electronics Inc.
3. Source: *Digital Video Magazine*, July 2002

©2002 Pioneer North America, Inc. Sony, Apple and Compaq are registered trademarks of Sony Corporation of America, Apple and Compaq Computer Corporation, respectively.

PC WORLD

In New Digital Format! Subscribe Now.

Why get PC WORLD in digital format?

PC WORLD
THE TROUBLE-FREE PC
OPTIMIZE WINDOWS
PROTECT YOUR DATA
PREVENT CRASHES
MAXIMIZE PERFORMANCE
KEEP YOUR SYSTEM HUMMING
DELL

1> Same great magazine.
Read the magazines you know in a convenient new format.

2> Immediate access.
Get your issues before they hit the newsstand, then read them anytime - even offline.

3> Keyword searchable.
Find a topic or name in seconds.

4> Live Links.
Quick hot links for easy navigation to Web content, advertisers' sites and other articles throughout the issue.

5> Paperless archives.
Keep back issues on your computer for fast reference and easy storage.

6> Great Savings.
Canadian and International subscribers will save even more as postage costs are eliminated!

CALL 1-800-825-7595
Use Order Code H3DMPCD

SPECIAL CHARTER PRICE

12 issues for $19.97
No Additional Postage in Canada and Foreign Countries

In Canada, price includes 7% GST (#R124669680).

Order Online and get Bonus Issue Instantly!
You'll get 13 issues for $19.97.
http://www.pcworld.com/digital

Presenting

Product Finder:

Your #1 Choice for

Shopping & Savings

Now you can get the best products and the best deals, all in one convenient place:
www.pcworld.com/productfinder

Netscape: PCWorld.com | Product Finder
Reload
Home
Search
Netscape
Print
Security
Shop
Stop
Calendar
Radio
People
Yellow Pages
Download
Customize...
PCWORLD.COM
TECHNOLOGY ADVICE YOU CAN TRUST
Home
News
Reviews
How-To
Features
Downloads
Tools
Product Finder
Magazine
Search for
within
Search
powered by PriceGrabber.com
Product Finder
Find product by name:
Go
or
Select product type
Digital Cameras
Filter Results
Compare
Sorted by Popularity | Sort by Price
Canon PowerShot G2 (4MP, 3x Optical, 3.6x digital) (Canon) - (7099A001)
Coolpix 995 2048X1536 3.34MP 16MB (Nikon) - (25047)
Nikon Coolpix 500
(Nikon) - (25501)

Whether you're starting to shop or you're ready to buy, *PC World's* **Product Finder** is the only resource you need on the Web. You'll find more than 200,000 different products—including PCs, digital cameras, DVD drives, CD-RWs, PDAs, software, and more—along with detailed specs, helpful buying information, and shopping tools you won't find anywhere else.

- ***PC World* articles and ratings**
- **Lowest prices available**
- **Side-by-side feature and price comparisons**
- **User reviews from buyers like you**
- **Complete pricing info with tax & shipping charges**
- **Respected and reputable retailers**
- **Manufacturer rebates, discounts & promotions**
- **Much, much more!**

PC World's **Product Finder** brings you the very best in products, prices, and customer satisfaction.

PC WORLD

Visit **www.pcworld.com/productfinder** today!

proper inks and paper will improve both the quality and the longevity of your prints.

You'll always get the best results when printing photographs on paper that matches your printer's ink, whether it be pigment- or dye-based. (Pigmented inks contain small, waterproof color flecks that make them more fade-resistant than water-soluble, dye-based inks, which typically last only six months to a year without fading.) And the best papers for your printer are usually those made by your printer's manufacturer. Vendors optimize their printers for specific kinds of paper and ink—usually their own proprietary blend—so if you use paper different from what the manufacturer recommends, your prints may fade quickly, according to Henry Wilhelm, founder and president of Wilhelm Imaging Research. Wilhelm's lab derives the longevity of papers and inks by conducting special high-intensity light, humidity, and temperature tests that simulate typical indoor display conditions. By putting prints in a controlled environment and increasing the amount of light that a typical room would receive in a day, Wilhelm can induce fading, changes in color balance, and staining normally occurring over months or years of display. (Visit find.pcworld.com/32171 to learn more about Wilhelm's latest tests of paper and ink longevity.)

PAPER TRADE-OFFS

PHOTO MEDIA comes in a range of surface textures, including glossy, semigloss, luster, and matte. Your choice is largely a matter of personal preference, but it also depends on what you plan to do with your prints.

An ink jet printer can place dots more accurately on a smooth surface. And the smoother the surface, the sharper the print will appear to your eye. For that reason, glossy paper might seem like a better choice for smaller prints. Unfortunately, glossy surfaces show fingerprints more easily than others and tend to crack when folded, so matte paper may work better for photos that will be handled frequently, such as wallet-size prints.

Photo-quality media is coated with either a polymer-based layer or a porous ink-receiving layer.

General Printer

# 2 CANON'S I550 COLOR BUBBLE JET is the fastest general-purpose printer by far, and it renders photos with sharp detail and smooth textures.

General Printer

# 3 HP'S DESKJET 3820 has a tall, boxy profile, unlike other HP printers. It produced detailed-looking glossy photos, and its text was clean, albeit a bit light.

Polymer coatings usually feel sticky to the touch and take a long time to dry, but they have good stability over time. On the other hand, this type of paper has low resistance to moisture and humidity, so storing prints in a dry place is key to their long-term survival. You should use only dye-based inks, like those in the Epson Stylus Photo 960, on polymer-coated media; because pigment-based inks are insoluble, their particles would sit on the surface of the paper and could scratch off easily.

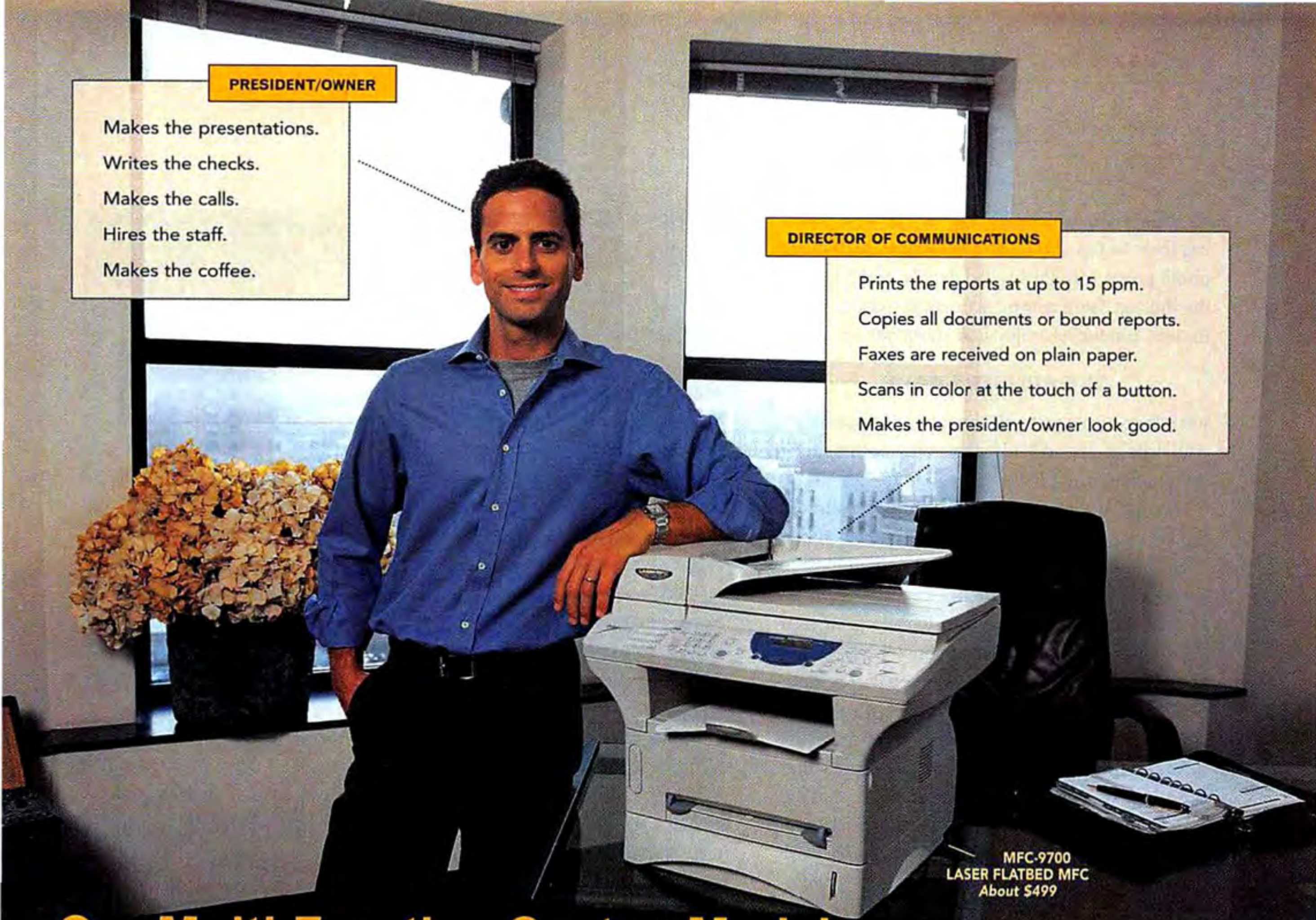
Porous media dries much more quickly and has better water resistance than polymer-coated media does. It also accepts pigment-based inks (which are naturally water resistant) readily. Porous media is generally more expensive, however. Its surface is exposed to air, so it is more prone to fading and discoloration. All of the Canon printers we tested use pigment-based inks and porous photo papers.

Currently, Lexmark printers use dye-based inks. The company does not have its own line of photo media; instead it optimizes its printers for Kodak ink jet photo paper, which it recommends.

HP's Photosmart 7550 combines the best of both worlds: It provides three ink cartridges—black, photo, and standard—with both pigment- and dye-based inks. The black cartridge is a pigmented ink designed for text printing on plain paper; the ink will not adhere well to photo paper. The standard color ink cartridge, however, contains dye-based inks used for both plain paper and photos. The photo ink cartridge contains light cyan, light magenta, and a photo black; for photo printing, the standard and photo cartridges are used at the same time. The Photosmart 7550 earned a score of Good for text quality, and its test photos (printed using the dye-based photo black ink) showed wonderfully crisp details. Even though the black tones looked a little murky, HP's 7550 received a score of Very Good for photo quality.

HP's general-purpose Deskjet 5550 includes only standard black and color cartridges, but you can buy a photo color cartridge separately and swap it with the standard black when you want to print photos. The company's general-purpose mod- ▶

PHOTOGRAPHS: RICK RIZNER



PRESIDENT/OWNER

Makes the presentations.
Writes the checks.
Makes the calls.
Hires the staff.
Makes the coffee.

DIRECTOR OF COMMUNICATIONS

Prints the reports at up to 15 ppm.
Copies all documents or bound reports.
Faxes are received on plain paper.
Scans in color at the touch of a button.
Makes the president/owner look good.

MFC-9700
LASER FLATBED MFC
About $499

Our Multi-Function Center® Models Do Everything. Just Like You.

It's your company and your hard earned money. So everyone and everything has to do more than expected. Our all-in-one MFCs are made for people like you. They're designed to do everything you need and then some. And with more than 10 models to choose from, PC or Mac compatible, finding one with the performance and price you're looking for won't be a problem.

Some even have the ability to print from a digital camera without a PC. You don't need five separate machines. All you need is the right one.

COLOR
FLATBED MFC
From $249

LASER FLATBED MFC
From $399

LASER MFC
From $299

COLOR MFC
From $149

A VARIETY OF MODELS AVAILABLE AT:

Office Depot, OfficeMax, Staples, J&R ComputerWorld, Global Computer Supplies, MicroCenter, Fry's, PC Connection, MicroWarehouse, CDW, Insight, PC Mall, Quill, Viking, Dell, Amazon.com, Gateway.com, Buy.com and 4Sure.com

At your side.™

brother®

© 2002-2003 Brother International Corporation, Bridgewater, NJ • Brother Industries, Ltd., Nagoya, Japan
For more information please call the Brother Fax-Back System at 800-521-2846 or visit our web site at www.brother.com

els offer pigment-based black inks as well, boosting their text quality. The $99 Deskjet 3820 made photo prints with fairly good details, and it earned the highest score among general-purpose printers for text, producing bright and sharp output.

THE NUMBERS GAME

PRINTERS CONTROL ink coverage and appearance with droplet size and ink colors, but another factor influencing print quality is resolution.

The mushrooming dots-per-inch (or resolution) figures on printer spec sheets—they now go up to 5760 dpi—seem too high to be true; you have to wonder what good that extra resolution does. Manufacturers use those numbers to grab your attention in the computer store, but when it comes to resolution, higher isn't always better. The dots-per-inch figure is a measure of the number of points on a square inch of paper where the printhead can theoretically place dots. The printer may fire an ink droplet onto any of those points, but if it actually put ink on more than a small fraction of those spots, the paper would be completely saturated with ink, and you'd see only a muddy blob.

Today's ink jet printers can produce far more dots than your eye can perceive. Even the lowest-resolution printer we tested, HP's 1200-by-1200-dpi Deskjet 3820, offered bright and detailed photo prints. While many elements affect the quality of your print, a printer's maximum resolution is no longer an issue. In fact, our top-rated photo printer offers only 2880 by 1440 dpi.

Though ink jet printers are capable of high resolutions, what's important is the resolution of the image you send to the printer. The larger the print size, the more pixels you must have in the original image to maintain optimum image quality. In our June 2002 article "How to Print Perfect Photographs," we recommend using an image that is no less than 1600 by 2000 pixels for printing an 8-by-10-inch photo. A good rule of thumb is that images snapped with a 2-megapixel camera are best for 5-by-7-inch prints and those from a 3-megapixel camera work for 8-by-10-inch prints.

MATCHING COLORS

YOU MAY HAVE HAD the frustrating experience of seeing a vibrant photograph displayed on screen, only to find that when you printed it, those bright colors turned dark and dingy. What happened?

The problem is that your printer and monitor didn't interpret the color information in the ▶

INK DROPLETS

Tiny Droplets Form a Big Picture

YOU MAY NOT see all the dots that your printer lays down on the page, but the configuration of those tiny dots can mean the difference between a grainy photo and one that you're proud to put in a picture frame.

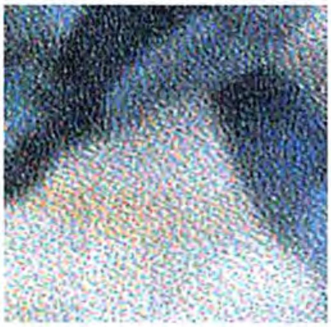
Ink jet printers deposit dots of ink in blended patterns that are designed to simulate continuous color tones, and (as explained on page 112) they have varying methods of doing so. To examine how the printer manufacturers' different techniques compare with one another, we took a small sample area of a photo print and enlarged it 750 percent.

Original Image
We magnified the circled portion 750 percent.

Six- and seven-ink printers use light cyan and light magenta to help create smoother gradations and subtler dot patterns. We saw marvelous photo quality from Epson's Stylus Photo 2200, using seven inks. HP's 7550 created extremely detailed prints with six inks. Canon's I550, a general-purpose, four-color ink jet, printed good-looking photos with colors that were a tad washed out. Photos from Lexmark's four-color ink jet looked grainy, with dull colors.

HP Photosmart 7550
This unit compensates for fixed-size droplets by using light photo inks.

Epson Stylus Photo 2200
You can barely see the dots this seven-color printer lays down.



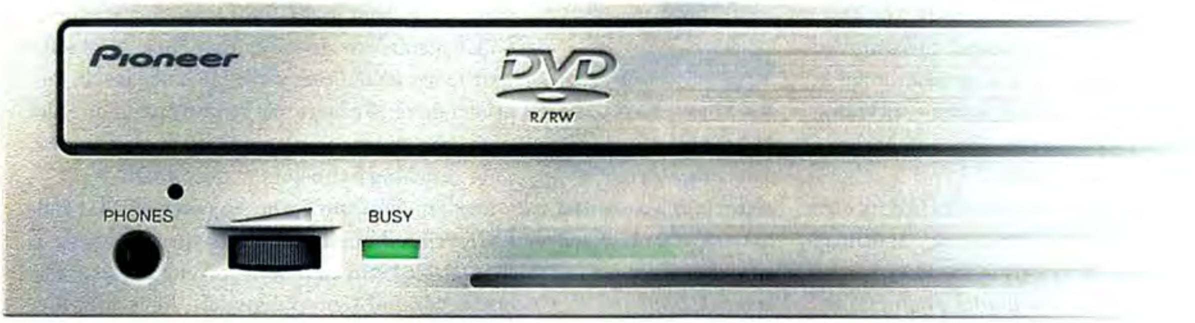
Canon I550
Canon printers have different-size nozzles to make varying droplets.

Lexmark Z55se
The Z55se varies droplet size; the smallest are in detailed areas.

Pioneer sound.vision.soul

DVD R/RW

AV PC DVD R/RW COMPATIBILITY
DVD Forum world standards for AV/PC applications, DVD-R/RW provide compatibility with most existing DVD playback devices.



IN 1998, WE WERE THE FIRST TO LAUNCH. TODAY, WE'RE READY TO FLY.

Introducing the DVR-A05, Pioneer's new DVD Recorder with 4x speed. The company that introduced the first recordable DVD drive presents the next generation of DVD recorders. The DVR-A05 can record a full 4.7GB disc in about 15 minutes. In fact, it takes the kind of flawless performance that *PC World* magazine voted *"World-Class for 2002"* to a whole new level.* So if you'd like to fly through video or data recordings, log onto www.pioneerelectronics.com/dvdr.htm to find a reseller near you.

4X
WRITE
DVD-R

© 2002 Pioneer Electronics (USA) Inc. Business Solutions Division *2002 "*PC World* World-Class Award" was given to the DVR-A04 DVD recorder.

photograph the same way. Currently, two color-matching technologies, Print Image Matching (PIM) and Exchangeable Image File Format for Digital Still Cameras (EXIF) Print, attempt to address this problem. Each technology requires a compatible digital camera that saves additional data in the header of the image file, which your printer uses to reproduce the image faithfully.

All digital camera manufacturers support the open-standard EXIF for storing information—such as the date and time recorded and the orientation of the shot—into the header of the image file. A few months ago EXIF Print (or EXIF 2.2) was announced; this standard introduces new data fields that are also stored in JPEG file headers. Many companies—including Adobe, Canon, Epson, HP, Kodak, and Nikon—currently support EXIF Print.

A couple of years ago, Epson launched its own color-matching technology, Print Image Matching. It uses proprietary extensions to the EXIF header to store additional data in digital photographs. (PIM works only with Epson printers.) Since PIM was launched, Casio, Kyocera, Minolta, Panasonic, Pentax, Ricoh, Sony, and Toshiba have signed on to support that standard in their digital cameras. Notably absent from that list are rival printer manufacturers Canon and HP.

PRINTING PRETTY PICTURES

MOST CAMERAS ENCODE images using a color space for monitors that's called SRGB—a standard developed by HP, Microsoft, and others to enable consistent color reproduction from monitor to monitor. Screens can display only a limited range of colors, however, so some color information is sacrificed when an image is stored in SRGB. Ink jet printers can reproduce a wider spectrum of colors—one that's closer to the full capabilities of a digital camera.

The extra information in PIM and EXIF compensate for the reduced color space of your monitor, as well as account for lighting conditions and your digital camera's settings. Essentially, PIM sends instructions to an Epson printer, telling it how to handle the image. In contrast, EXIF Print records the camera's settings at the time the photograph was taken and lets an EXIF Print–enabled printer, such as the Canon S530D, determine how those images should appear on paper.

IMPROVE YOUR IMAGE

TO TAKE ADVANTAGE OF the automatic color-correction features of PIM or EXIF Print, you must print directly from your original image file. If you use an image editing package such as Adobe Photoshop or Ulead PhotoImpact to make color adjustments, you'll lose PIM and EXIF Print's benefits.

Different printer manufacturers implement EXIF Print in different ways. For example, Canon requires you to use its Easy Photo Print software to use EXIF Print, while HP embeds it in the printer driver. Printers that receive output directly from your camera or memory card implement the color-matching technology in the printer.

New printers from Epson support both PIM and EXIF Print, though Epson recommends using a PIM-enabled camera with its six-color ink jet printers. Several of Canon's models, including the S530D, already support EXIF Print in the company's Easy Photo Print software. Updated software for the Canon I850 and other models will be available for download soon. HP offers a printer driver for its Deskjet 5550 that supports EXIF Print; it's available for download from the HP Web site, and HP promises that it will have updated drivers for more models soon.

If you're thinking about buying a new photo printer, first check to see which of the two color-matching standards your digital camera supports (far more cameras support EXIF Print than PIM).

THE BOTTOM LINE

PHOTO PRINTERS come in as many variations as photographers do, so there's bound to be a model with the combination of features, image quality, and price that suits your budget and your specific needs. But whichever printer you choose, one thing is for sure: You'll never have to drop off film at the drugstore again. ■

General Printer

#4 EPSON'S STYLUS C62 printed photos with natural-looking colors, except in skin tones. Text was a bit washed out, and gray-scale images had a brownish cast.

General Printer

#5 LEXMARK'S Z55SE is best suited for text and line art. Its photo prints lacked the bright colors and realistic skin tones that we saw from the other printers.

Paul Jasper is a technology consultant and freelance writer based in San Francisco. Dan Littman is a contributing editor at PC World.

PHOTOGRAPHS: RICK RIZNER

Microsoft Picture It!
Digital Image Pro
Microsoft

Picture It!® Digital Image Pro. Get the shot. Make it great later.

Now it's easy to make your photos real keepers. Retouch like a pro in no time. Adjust the lighting and composition. And get creative with tons of advanced filters and effects. Then, share your best any way you want. **pictureit.com**

© 2002 Microsoft Corporation. All rights reserved. Microsoft and Picture It! are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. **Microsoft**

Everything you ever wanted in a PC.

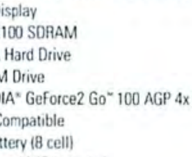
Including that "Wow, I got a great deal" feeling.

Select Dell desktops feature high performance Intel® Pentium® 4 Processors.

Ask about
0% APR for 6 months*
for well-qualified customers on purchases $500 or more

Who says you can't have it all? Whether it's for basic applications or the latest digital technology, Dell offers a wide variety of desktops and notebooks designed to fit your lifestyle and your wallet. When you order from Dell, a PC expert helps you figure out what you need so you get a PC that's uniquely yours. Since we use high-quality, reliable technology, like Intel® Pentium® 4 Processors with awesome performance for music, digital photos, gaming, and beyond you know you're getting a high-quality, reliable PC. And, as always, it comes backed by award-winning service and support available 24/7, 365 days a year. Best of all, when you order direct you get the right PC at the right price. So go online or call today. We'll show you how easy it is to get everything you ever wanted in a PC.

Dell | Home Notebooks



Inspiron™ 2650 Notebook

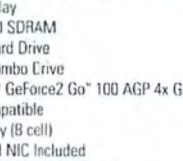
Practical and Affordable Mobility

- Mobile Intel® Pentium® 4 Processor-M at 1.70GHz
- 14.1" XGA TFT Display
- 128MB DDR PC2100 SDRAM
- 20GB* Ultra ATA Hard Drive
- 24x Max CD-ROM Drive
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4x Graphics
- Sound Blaster® Compatible
- 59WHr Li-Ion Battery (8 cell)
- Internal Modem and NIC Included
- Microsoft® Windows® XP Home Edition
- WordPerfect® Productivity Pack with Quicken® New User Edition

$999 or as low as **$30**/mo.*
E-VALUE Code: 14442-D81209m

Make this your perfect PC:

- 256MB DDR PC2100 SDRAM, add $50
- 24x CD-RW/DVD Combo Drive, add $169
- Deluxe Nylon Carrying Case, add $49



Inspiron™ 2650 Notebook

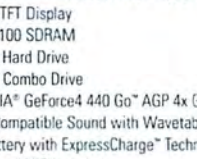
Mobile Power, Great Price

- Mobile Intel® Pentium® 4 Processor-M at 1.70GHz
- 14.1" XGA TFT Display
- 256MB DDR PC2100 SDRAM
- 20GB* Ultra ATA Hard Drive
- 24x CD-RW/DVD Combo Drive
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4x Graphics
- Sound Blaster® Compatible
- 59WHr Li-Ion Battery (8 cell)
- Internal Modem and NIC Included
- Microsoft® Windows® XP Home Edition
- WordPerfect® Productivity Pack with Quicken® New User Edition

$1229 or as low as **$37**/mo.*
E-VALUE Code: 14442-D81212m

Make this your perfect PC:

- 15" XGA TFT Display, add $50
- 30GB* Ultra ATA Hard Drive, add $59
- 32MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4x Graphics, add $99
- Windows® XP Professional, add $79



Inspiron™ 8200 Notebook

Ultimate Mobile Multimedia Performance

- Mobile Intel® Pentium® 4 Processor-M at 1.80GHz
- 15" Super XGA+ TFT Display
- 512MB DDR PC2100 SDRAM
- 30GB* Ultra ATA Hard Drive
- 24x CD-RW/DVD Combo Drive
- 32MB DDR NVIDIA® GeForce4 440 Go™ AGP 4x Graphics
- Sound Blaster® Compatible Sound with Wavetable
- 66WHr Li-Ion Battery with ExpressCharge™ Technology (8 cell)
- Internal Modem and NIC Included
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$1879 or as low as **$57**/mo.*
E-VALUE Code: 14442-D81218m

Make this your perfect PC:

- 2nd Li-Ion Battery, add $99
- ATI® MOBILITY™ RADEON™ 9000 64MB DDR 4x AGP Graphics, add $119
- Custom Leather Case, add $99
- 3-Year Limited Warranty,* 3-Year Mail-In Service, add $119

Dell | Home Desktops

NEW Dimension™ 2350 Desktop

Dell Outrageous Deal!
Limited time only

Affordable Desktop System

- Intel® Pentium® 4 Processor at 1.80GHz with 512K L2 Cache
- 128MB Shared DDR SDRAM* at 266MHz
- NEW 30GB* Ultra ATA/100 Hard Drive (7200 RPM)
- 15" E151FP Flat Panel Display
- Integrated Intel® 3D Extreme Graphics
- 48x Max CD-ROM Drive
- Integrated Audio
- Harman Kardon HK-206 Speakers
- 56K* PCI Data Fax Modem, Integrated 10/100 Ethernet
- Microsoft® Windows® XP Home Edition, Microsoft Works Suite 2002

Regular Price ~~$799~~ **Now Only** $699

after $100 mail-in rebate,* or as low as $24/mo.*
E-VALUE Code: 14442-D51207m

Make this your perfect PC:

- NEW 17" E171FP Flat Panel Display, add $160
- 40x/10x/40x CD-RW Drive with Roxio's Easy CD Creator,® add $50
- 256MB Shared DDR SDRAM* at 266MHz, add $50

NEW Dimension™ 4550 Desktop

Superior Performance, Smart Value

- Intel® Pentium® 4 Processor at 2GHz with 512K L2 Cache
- 256MB DDR SDRAM at 266MHz
- NEW 60GB* Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., .27 dp) E772 Monitor
- 32MB ATI® RAGE™ Ultra Graphics Card
- NEW 48x/24x/48x CD-RW Drive with Roxio's Easy CD Creator®
- Sound Blaster Live! 5.1 Digital Sound Card
- Harman Kardon HK-395 Speakers with Subwoofer
- 56K* PCI Telephony Modem
- Integrated Intel® PRO 10/100 Ethernet
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$999 or as low as **$30**/mo.*
E-VALUE Code: 14442-D51209m

Make this your perfect PC:

- 15" E151FP Flat Panel Display, add $150
- Altec Lansing® ADA745 4.1 Surround Speakers with Subwoofer, add $70
- 64MB DDR NVIDIA® GeForce4 MX™ Graphics Card with TV-Out, add $20
- Creative Audigy 2 Sound Card with DVD Audio, add $60

NEW Dimension™ 8250 Desktop

Cutting Edge Technology

- Intel® Pentium® 4 Processor at 2.40GHz with 533MHz Front Side Bus and 512K L2 Cache
- NEW 256MB PC1066 RDRAM
- NEW 60GB* Ultra ATA/100 Hard Drive (7200 RPM)
- 19" (18.0" v.i.s., .24dp) M992 Flat Screen Monitor
- 64MB DDR NVIDIA® GeForce4 MX™ Graphics Card with TV-Out
- 16x Max DVD-ROM Drive
- NEW 48x/24x/48x CD-RW Drive with Roxio's Easy CD Creator® (2nd bay)
- Spound Blaster Live! 5.1 Digital Sound Card
- Altec Lansing® ADA745 4.1 Surround Sound Speakers with Subwoofer
- 56K* PCI Telephony Modem
- Integrated Intel® PRO 10/100 Ethernet
- Microsoft® Windows® XP Home Edition, Microsoft® Works Suite 2002

$1499 or as low as **$45**/mo.*
E-VALUE Code: 14442-D51214m

Make this your perfect PC:

- NEW 17" E171FP Flat Panel Display, add $120
- New 128MB DDR ATI® RADEON™ 9700 TX Graphics Card with TV-Out and DVI, add $140
- NEW 512 MB PC1066 RDRAM, add $160
- Creative Audigy 2 Sound Card with DVD Audio, add $60

Dell | Standard Features

Each DELL system shown here has a number of standard features, including:

- Dell Picture Studio Image Expert Standard Edition
- Dell Jukebox powered by MUSICMATCH®
- 6 Months of MSN® Powered by Dell™ Internet Access Included*
- Dimension Desktops shown here include 1-Year Limited Warranty,* 1-Year At-Home Service,* Keyboard and Mouse
- Inspiron Notebooks shown here include 1-Year Limited Warranty,* 1-Year Mail-In Service

Dell | Solutions

Software and Peripherals

Desktop

- Lexmark™ X85 Multifunction (Prints, Scans, Copies, and Faxes), $179
- Epson® S820 Photo Printer, $99
- Belkin® SurgeMaster™ Gold Series Surge Protector with 10' Cord, $39
- Kodak Easyshare™ CX4230 Digital Camera, $199
- Canon® ZR45MC Digital Camcorder, $599 ($499 with system purchase)

Notebook

- Kensington® Saddlebag Kit, $99
- Targus® Auto/Air Adapter, $99
- Belkin® Notebook Surge, $30
- Kensington® Slim MicroSaver® Security Cable, $37
- Canon® BJC-85 Portable Printer, $299

Service and Support

Upgrade from Standard Warranty and Service Offering to:

3-Year Limited Warranty,* 3-Year At-Home Service*:

- Dimension 2350, $139
- Dimension 4550, $159
- Inspiron 2650, $179
- Inspiron 8200, $299

Accidents Happen!

Protect yourself with CompleteCare™ Accidental Damage Protection*:

- Dimension 1-Year, $39
- Dimension 3-Year, $99
- Inspiron 1-Year, $79
- Inspiron 3-Year, $149

Holiday shopping done smart. **Easy as DELL™**

Click **www.dell4me.com/pcworld** Call **1-877-945-3355**
toll free

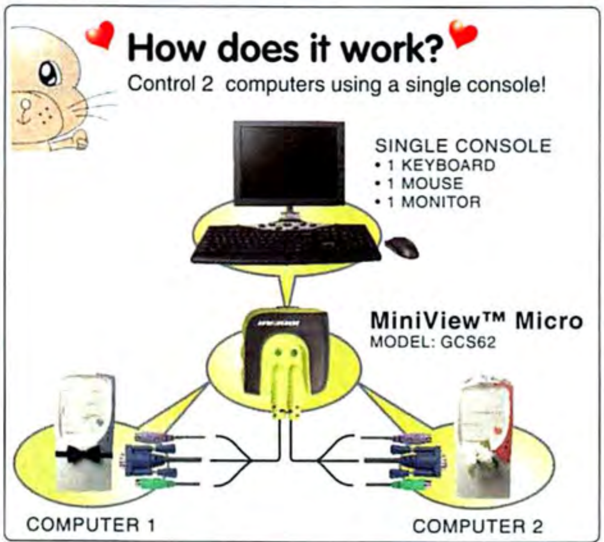
Dell recommends Microsoft® Windows® XP Professional for Mobile Computing

***MSN Powered by Dell: Telephone access (call your phone co. for details) and other surcharges for access may apply. Must register within 30 days of invoice and accept MSN powered by Dell Terms of Service.** You agree to be billed monthly fees after the initial service period. You may cancel service at any time. Offer valid for new customers only in U.S. households and must be over 18 years old with major credit card. Limited time offer. **Pricing/Availability:** Prices, specifications, availability and terms of offers may change without notice. Taxes and shipping charges are extra, and vary. Cannot be combined with other offers or discounts. Valid for U.S. Dell Home Systems Co. new purchases only. Dell cannot be responsible for errors in typography or photography. **Limited Warranty:** You can get a copy of our limited warranties and guarantees by writing Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682. To purchase warranty only or for information on other service options please call 1-800-915-3355 or visit dell4me.com/termsandconditions. **Service:** At-Home service provided via third-party contract with customer. Technician will be dispatched, if necessary, following phone-based troubleshooting. Availability varies. Other conditions apply. **Hard Drives:** For hard drives, GB means 1 billion bytes; accessible capacity varies with operating environment. **56K Modem:** Upload speeds are limited to 53Kbps. Download speeds are less (about 30Kbps). Speeds can vary by line condition and modem manufacturer. Analog phone line and service required. **PURCHASE PLAN: Dell Preferred Account:** Offered by CIT Bank to qualified U.S. residents with approved credit. Taxes and shipping charges are extra and vary. Monthly Minimum Payment based upon pre-rebate price. *No interest for Six Months Promotional Feature:* FOR WELL QUALIFIED CUSTOMERS. Offer available for new accounts with any purchase of $500 or more between 11/1/2002 and 1/31/2003. After 0% APR for 180 days, subject to the Standard variable APR (7.99% as of October 1, 2002). **CompleteCare:** CompleteCare service excludes theft, loss, and damage due to fire or intentional damage. CompleteCare is currently not available in all states. Not available for Dell Home Sales customers in CA, FL or NY. Not available for Employee Purchase Program customers (Government, Health Care and Relationship/Faculty, Staff and Students) in CA or FL. May not be available to all customers. For complete details, visit http://www.dell.com/us/en/gen/services/service_service_contracts.htm. **Shared Memory:** Between 32 and 64MB of system memory may be allocated to support graphics, depending on system memory size and other factors. **Mail-In Rebate:** Offer expires 1/31/2003, 11 PM CT. Rebate coupon must be postmarked within 30 calendar days of your system ship date and rebate checks are ordinarily processed within 8-10 weeks. See www.dell4me.com/rebates or call 1-800-624-9897 for rebate coupon and details. **Trademarks/Copyright Notices:** Intel, Intel Inside, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft, MSN and Windows are registered trademarks of Microsoft Corporation. ©2002 Dell Computer Corporation. All rights reserved.

VALUE

Keep your E-VALUE CODE handy! It's the easiest way to find and build your perfect PC when you decide to order.

IOGEAR®
IOGEAR
Live Happily Ever After...


How does it work?
Control 2 computers using a single console!
SINGLE CONSOLE
• 1 KEYBOARD
• 1 MOUSE
• 1 MONITOR
MiniView™ Micro
MODEL: GCS62
COMPUTER 1
COMPUTER 2

Live, Love, Share

It's the perfect marriage of form and function. This self-powered PS/2 KVM switch joins two computers with a single keyboard, monitor and mouse. Save desk space by placing the world's smallest KVM anywhere on or behind your desk, and switch between computers using Hot Key controls from your keyboard.

Built-in-Cable

LED Display

Compact In Size

MSRP: $49.95

buy.com
It's All Good™

Fry's ELECTRONICS

CDW® The Right Technology Right Away.™

Key3 Media Group PRESENTS COMDEX FALL 2002

Booth #2154

Contact Info. 23 Hubble Irvine, CA 92618 **P:** 949.453.8782 **F:** 949.453.8785 **Web:** www.iogear.com

Entire Contents Copyright © 2002 IOGEAR All rights reserved. Reproduction in whole or part without permission is prohibited All other trademarks are the property of their respective owners.

FASTER for free

WANT TO GET MORE FROM YOUR MEGAHERTZ?

THESE SLICK TIPS AND TOOLS ARE LIKE A NO-COST PC UPGRADE.

WHO SAYS THERE'S no such thing as a free lunch? Windows is full of settings and utilities that, if properly applied, can boost your system's performance without costing you a dime. And the Internet is chock-full of free and inexpensive utilities that can help you squeeze out a little more juice from your system.

Of course, we're not talking about a full-fledged banquet. A budget Celeron-based system with its graphics integrated on the motherboard rather than handled by a separate card will never be able to comfortably run the latest digital death-match games or demanding graphics applications, for example. But if you carefully optimize all the components in your PC, you'll probably see a noticeable improvement in its performance. We're heading under Windows' hood to tweak your hard drive, memory settings, CD-R and CD-RW options, monitor, and network connections.

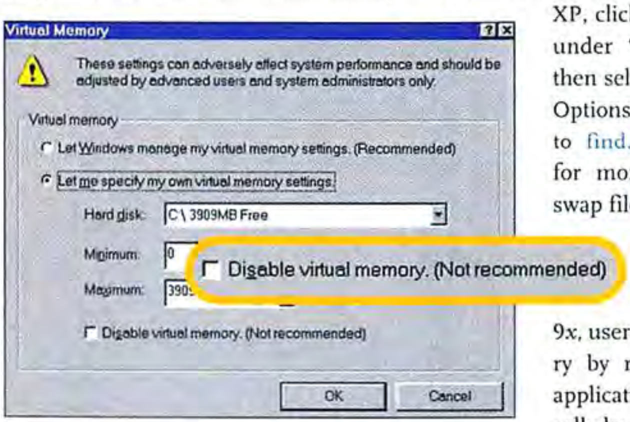
You'll also get a wide-ranging crash course in Drivers 101, and you'll learn about some great freeware, shareware, and Web-based tools to help make your PC purr. ▶

BY KIRK STEERS

REFRESH YOUR MEMORY

YOUR PC'S performance drops dramatically when you load and run more apps and data files than your PC has the memory to hold. That's because when your PC has insufficient RAM (the memory on the motherboard) to accommodate a request to load more code or data, it stores the contents of some of your RAM in a swap file on your much-slower-to-access hard disk, thereby freeing up memory for the new task. When previous tasks need code or data that is now in the swap file, your computer saves other RAM contents to the swap file (called the paging file in XP/2000) and loads the previously saved data into the newly freed memory. The more times your PC has to save and load swap file data, the slower its performance becomes. That's why increasing the amount of RAM in your system can improve its performance. Memory does, of course, cost money. Here are a few free memory-enhancement alternatives.

♦ **Swipe your swap file:** Defragmenting your swap file will boost your PC's performance, but Windows' Disk Defragmenter doesn't work on your swap file because that file is always "in use." The workaround, however, is simple: Temporarily remove the swap file before defragmenting the drive. In Windows 98 and Me, right-click *My Computer*, choose *Properties*, and click the *Virtual Memory* button under the *Performance* tab in System Properties. Then select *Disable virtual memory. (Not recommended)*, as shown in **FIGURE 1** below.



Virtual Memory

These settings can adversely affect system performance and should be adjusted by advanced users and system administrators only.

Virtual memory

○ Let Windows manage my virtual memory settings. (Recommended)

● Let me specify my own virtual memory settings.

Hard disk: C:\ 3909MB Free

Minimum: 0

Maximum: 390

☐ Disable virtual memory. (Not recommended)

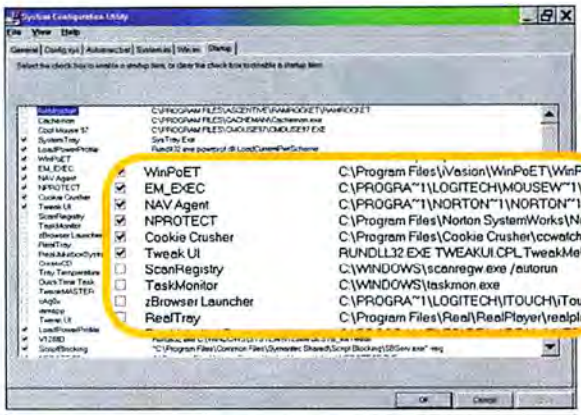
FIGURE 1: Optimize your PC's performance by properly configuring your virtual memory settings.

If your computer runs out of RAM with virtual memory disabled, it can crash. So don't run any other software while defragmenting. And be sure to reactivate the file once the defragmenting is completed.

Another trick that can speed up virtual memory is to freeze the size of the swap file. By default, Windows shrinks and expands the swap file to suit its needs. By fixing the file's size, you save Windows from this computational hassle. Return to your *Virtual Memory* settings and enter the same value in the Minimum and Maximum boxes (*Answer Line* columnist Lincoln Spector recommends 384MB for both). If you have a second hard drive, put your swap file on that drive for an additional boost.

To find your virtual memory settings, right-click *My Computer*, select *Properties*, and choose the *Advanced* tab. In Windows 2000, click the *Performance Options* button under 'Performance'. In XP, click the *Settings* button under 'Performance', and then select the Performance Options' *Advanced* tab. Go to find.pcworld.com/30219 for more on setting your swap file (paging file).

♦ **Stop unwanted starts:** In Windows XP, Me, and 9*x*, users can free up memory by removing unwanted applications that automatically launch when Windows starts. To find out just how many of these programs reside on your system, click *Start*•*Run*, type **msconfig**, and press **<Enter>**; this will bring up the System Configuration Utility. Click the *Startup* tab to see a list of all the programs that automatically launch when Windows starts (see **FIGURE 2**).



☑	WinPoET	C:\Program Files\iVasion\WinPoET\WinPP
☑	EM_EXEC	C:\PROGRA~1\LOGITECH\MOUSEW~1\SY
☑	NAV Agent	C:\PROGRA~1\NORTON~1\NORTON~1\NA
☑	NPROTECT	C:\Program Files\Norton SystemWorks\Nortor
☑	Cookie Crusher	C:\Program Files\Cookie Crusher\ccwatch.exe
☑	Tweak UI	RUNDLL32.EXE TWEAKUI.CPL,TweakMeUp
☐	ScanRegistry	C:\WINDOWS\scanregw.exe /autorun
☐	TaskMonitor	C:\WINDOWS\taskmon.exe
☐	zBrowser Launcher	C:\PROGRA~1\LOGITECH\ITOUCH\iTouch.e
☐	RealTray	C:\Program Files\Real\RealPlayer\realplay

FIGURE 2: Speed Windows' launch and free precious memory by preventing unwanted programs from starting automatically.

To prevent a program from launching at start-up, uncheck the box next to its name. If you're unsure what a particular program does, look at the name of the folder that the file is stored in; this information, which you'll find to the right of the box, usually provides a clue.

Windows 2000 users have some control over start-up apps, too: Select *Start*•*Settings*•*Taskbar & Start Menu*; click the *Advanced* tab; click the *Advanced* button; double-click *Programs* in the Explorer window that subsequently opens; and then open the *Startup* folder to view, add, or delete shortcuts that run when you start Windows.

♦ **Look for leaks:** Poorly written software can monopolize your PC's memory even when it's not running. Track down such leaks by checking your memory's behavior via Windows' System Monitor and with FreeMem, a handy memory management utility that's available at find.pcworld.com/30220.

♦ **Spend your cache wisely:** Windows allocates small amounts of memory, called caches, as storage buffers for your hard disk, CD-ROM drive, and other storage devices. Reducing the cache allocated to a seldom-used device such as a CD-ROM drive frees memory that may be used more effectively as system RAM. Conversely, increasing the cache size of a frequently used device can speed that device's performance.

Finding the balance that works best for you is matter of trial and error. To simplify the task, go to find.pcworld.com/30221 to download Cacheman 5, an excellent utility that consolidates the cache and memory settings Microsoft scatters throughout Windows.

GOOD DISKKEEPING COUNTS

A CLEAN HARD DISK is a happy hard disk. Running Windows' Disk Defragmenter periodically can speed up your PC's performance, especially if you use programs that frequently access the hard disk. Defragmenting today's super-high-capacity hard drives can take a long, long time, however, so run Disk Defragmenter when you won't need your PC. In most versions of Windows, you can activate Disk Defragmenter by opening *My Computer*, right-clicking the drive, choosing *Properties*, selecting the *Tools* tab, and clicking *Defragment now*.

Another good method of minimizing disk clutter is to remove files that you don't need and uninstall old software that you no longer use. Your first choice for handling this task should be the uninstall program that comes with the software. For those programs that lack an uninstall utility, use the Add/Remove Software applet in Control Panel. Deleting old programs any other way may leave unwanted, hard-to-find files or Registry settings that could cause your PC to have trouble later on.

Microsoft's Tweak UI is an indispensible tool for, among other tasks, disabling annoying animations, useless sounds, and other cosmetic Windows features that eat up CPU cycles. Go to find.pcworld.com/31613 to download the appropriate version of Tweak UI for the version of Windows you use (the link to the XP version of Tweak UI is near the bottom of that page).

BETTER BURNING

IF YOU CAN'T GET your CD-RW and CD-R drives to burn discs at their optimum speed, it usually means that your PC isn't feeding your CD burners a constant stream of data. Here are a few suggestions to rectify that situation.

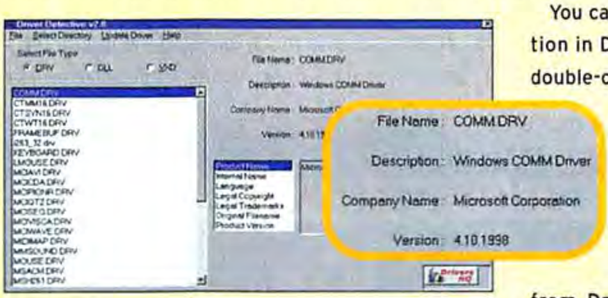
- **Crush the competition:** Before attempting to burn a CD, you should disable any virus software, screen savers, or other programs that compete for your PC's resources. If your PC is connected to a busy network, try logging off before burning; at least disable File and Print Sharing under Network Properties. To do so in Windows 2000 and XP, right-click *My Network Places*, choose *Properties*, select *Advanced•Advanced Settings* on ▶

STAY UP-TO-DATE

DRIVERS EDUCATION

RUNNING YOUR PC with outdated drivers is like driving your car on bad tires: You can get where you're going, but the trip will be needlessly bumpy, and you risk crashing. It's not unusual for hardware manufacturers to send products to market before all the bugs are ironed out, and the drivers that come installed on a new PC or with a new piece of hardware can quickly go out-of-date. Here's how to find and install the latest drivers.

Know your make and model: Typically, the latest drivers for your PC's hardware are available for downloading from the manufacturer's Web site or from a site such as DriversHQ.com that specializes in finding drivers. Know the exact model number of the component and the current driver's version number before you start looking for an update. You can find this information in Device Manager by double-clicking the component's listing and then selecting the Driver tab. Or download and run Driver Detective, a handy free utility from DriversHQ.com (see FIGURE 3). Go to find.pcworld.com/30226 to get your copy.



File Name: COMM.DRV

Description: Windows COMM Driver

Company Name: Microsoft Corporation

Version: 4.10.1998

FIGURE 3: Driver Detective tells you which of your Windows device drivers need to be updated.

Excise the old: If you're replacing a card, remove the old card's drivers before you install the new device. Open *Device Manager*, select the old device, and click the *Remove* button. Since you can't remove the driver for a graphics card you're replacing, change its driver to the standard Windows VGA driver before you make the switch.

Be sure to follow directions: Read all the documentation you can find for the new peripheral, and heed its advice. If the new driver comes with its own installation program, use that. Otherwise, install drivers via the Driver tab in Device Manager, or by using Windows' Add New Hardware utility in Control Panel.

Don't be afraid to ask: Sometimes documentation for a device is sparse, poorly written, or just plain wrong. If you have any doubts, call the vendor's tech support line before you start the installation. This can save you hours of trouble later.

Never, ever interrupt a driver installation: If you change your mind about installing a new driver, or if you think you've made a mistake and want to start over, always finish the current installation and then uninstall it. Interrupting a driver installation may permanently alter or corrupt key system files and force you to reinstall Windows.

the menu, and uncheck *File and Printer Sharing for Microsoft Networks.* In Windows 98 and Me, right-click *Network Neighborhood* or *My Network Places* (depending on your version of Windows), and choose *Properties.* Select the *Configuration* tab, click *File and Print Sharing,* and uncheck both options.

♦ **Master your domain:** Many new CD-RW drives support bus mastering, a technology that creates an express lane for CD-RW–bound data. If you use Windows 2000 or XP and your CD-R/RW drive came with your system, bus mastering is likely enabled on the drive by default. If you use Windows 98 or Me, bus mastering may not be enabled. To find out whether it is, right-click *My Computer,* select *Properties,* click the *Device Manager* tab, double-click your CD-RW drive, and under the *Settings* tab, confirm that the box labeled *DMA* is checked (see **FIGURE 4** on page 128); this setting means that bus mastering is enabled.

♦ **Buy the right CDs:** Some brands of CD-RW and CD-R media work better with specific drives. A CD that records easily at 8X on one CD-RW drive may work at only 4X on another. Check for any recommendations from the manufacturer of your CD-RW drive.

IMPROVE YOUR VIEW

WITH PCs, what you see is what you get. And if what you see is a blurry image or jumpy video, then what you get is a headache. Here are some tips for enhancing your viewing pleasure.

♦ **Get the right DirectX files:** Short of purchasing a new graphics card, the best way to improve your computer's graphics performance—and all of its multimedia performance, for that matter—is to get the latest DirectX drivers. Head to find.pcworld.com/30222 to download them.

♦ **Show fewer colors:** You can improve your PC's graphics speed by reducing the system's color depth—the number of colors your graphics card can display. Right-click your desktop, click *Properties,* and choose the *Settings* tab. Dropping the settings under 'Color quality' from 'True Color (32-bit color)' to 'High Color (16-bit color)' will get you slightly faster graphics with a tolerable drop in image quality. You can get even more graphics speed by going a notch lower to '256 colors (8-bit color)', but the results won't be much to look at—literally.

♦ **Reallocate your memory:** If you have a budget system that has graphics integrated on the motherboard—meaning that both graphics and standard computing functions share the main system memory—you may be able to increase graphics performance by dedicating more system memory to graphics functions. Check your CMOS setup program to see whether this is possible on your system. To access the program, enter **<F1>**, **<Esc>**, or whatever key the screen prompts you to hit while your system starts up but before Windows loads.

♦ **Touch that dial:** Don't be afraid to fiddle with your monitor's settings to find what's most pleasing. Note that a too-bright screen can cause your peepers to tucker out more quickly, however. ▶

FEATURES COMPARISON

PC MONITORING AND DIAGNOSTIC SOFTWARE

	PRODUCT NAME	Price	Download size	What it does	Comments
Freeware	Active SMART Monitor 1.1 Pantera Software www.panterasoft.com	Free	780KB	Self-Monitoring, Analysis, and Reporting Technology (SMART) utility predicts potential drive failures and sends e-mail and/or network alerts when thresholds are exceeded.	Can be set to monitor at Windows start-up and shutdown, or to monitor continually.
	AIDA32 3.1 www.aida32.hu/aida32.php	Free	1.5MB	Presents tremendous amount of info on motherboard, BIOS, operating system (including service packs), storage, display, fonts, drivers, number of log-ons per user, Internet settings, installed programs, start-up programs, Windows updates, and more.	The Explorer-like interface puts all your pertinent system information in one easy-to-reach place. Look for AIDA16 if you've got a pre-Windows 95 system.
	Fresh Diagnose 5.1 Fresh Devices www.freshdevices.com/freshdiag.html	Free (registration required)	1.1MB	Gives detailed information on your system's hardware and software, including file associations, fonts, registered libraries, OLE objects, system policies, buses, CMOS, processor, drives, display adapters, I/O devices and ports, network settings, IRQs, DMA channels, and more.	Provides a wealth of system data in a clear, Explorer-like interface. You can save and print the results of benchmark tests, but the tests themselves are explained only briefly.
Shareware	Ashampoo WinOptimizer Suite 1.32 www.ashampoo.com	$40 (registration required)	10MB	Integrates several separate utilities, including Drive Cleaner, Registry Cleaner, Internet Cleaner, Internet Tuner, StartUp Tuner, File Wiper, and DLL Cleaner.	The program's many options are clearly explained. It offers many backup options and encourages you to use them.
	Dacris Benchmarks 5 Dacris Software benchmarks.dacris.com	$25 (registration required)	1.4MB	Runs unattended speed tests of processor, memory, hard disk, 2D graphics, 3D graphics, Internet, and network. Identifies system bottlenecks.	Exports test data to Excel. In testing, the program was unable to identify a 3Com EtherFast network card. Also available in a free Lite version.
	Dr. Hardware 2002 3.5.0e www.dr-hardware.com	$19	2.3MB	Benchmarks CPU/memory, multiprocessor, graphics, hard disks, CD-ROM drives, ASPI drives (ATAPI and SCSI), and remote drives. Reports on free and used hard disk capacity (graph and percentage), as well as CD-ROM drive, other hardware, and Windows information.	Breaks down file statistics by file type (.exe, .dll, .html, and so on). Diagrams CPU usage and includes a CMOS settings viewer.

LV-S2

Project a 100-inch image
from 9.2 feet,
1000 ANSI Lumens, SVGA,
Microportable

NEW

LV-X2

Project a 100-inch image
from 9.2 feet,
1100 ANSI Lumens, XGA
Microportable

NEW

LV-7355

Project a 100-inch image
from 9.2 feet,
2200 ANSI Lumens, XGA
Ultraportable

NEW

LV-7545

3700 ANSI Lumens, XGA
Portable/Interchangeable Lenses

THE IMAGE QUALITY YOU WANT. THE PROJECTOR YOU NEED.

Now, there's a Canon projector that looks as good to your audience, as it does on your budget. That's because Canon, the world leader in optics, understands that image quality is essential to holding an audience's attention, and value is critical to your purchasing decision. From our highest quality LV-7545 with 3700 ANSI Lumens and interchangeable lens design; to our versatile LV-7355 with 2200 ANSI Lumens and shorter throw; to our portable LV-X2 with 1100 ANSI Lumens and Native XGA resolution, to our economical LV-S2 (1000 ANSI Lumens) and new optical block for enhanced image quality; Canon has the right projector for you.

Plus when you buy a Canon projector you can use it with our full line of digital cameras, camcorders, video visualizers and other image capture tools to create powerful multimedia presentations with graphics and video, as well as text.

Visualizer
RE-450X
PR-200S
Presentation Ass't
XL-1S Mini DV
G2 Digital Camera

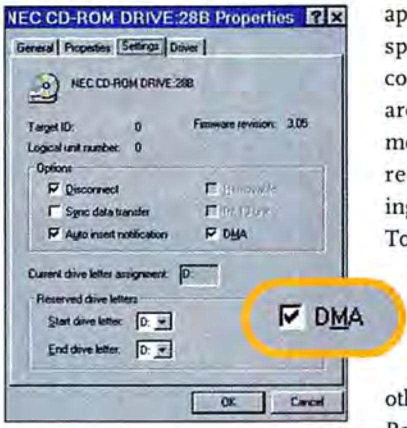
Canon has the full line to visually enhance any presentation.

For product info and dealer locations, visit us online at www.canonprojectors.com, or call 1-800-OK-CANON.

Canon KNOW HOW™

Canon is a registered trademark and Canon Know How is a trademark of Canon Inc. ©2002 Canon USA, Inc.

And be sure to hit the degauss button every now and then; if your monitor has been on for a long time, degaussing can sharpen your image considerably.



NEC CD-ROM DRIVE:28B Properties

General | Properties | Settings | Driver

NEC CD-ROM DRIVE:28B

Target ID: 0 Firmware revision: 3.05

Logical unit number: 0

Options

☑ Disconnect

☐ Sync data transfer

☑ Auto insert notification

☑ DMA

Current drive letter assignment: D:

Reserved drive letters

Start drive letter: D:

End drive letter: D:

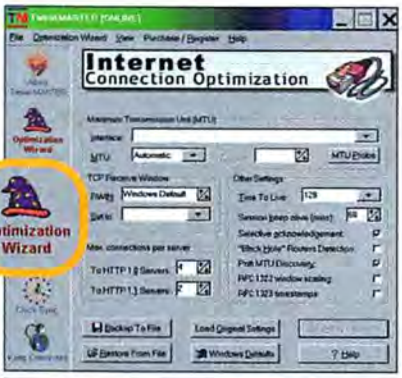
OK
Cancel
☑ DMA

FIGURE 4: Make sure bus mastering is enabled to get the top speed from your CD-R/RW drive.

QUICKER CONNECTIONS

EVER GET E-MAIL from vendors offering to double the speed of your Internet access? Be skeptical: These invitations are usually in a class with e-mail messages that promise easy money, hair restoration, or anatomical enlargements. Usually, speeding up your Net access requires moving to a faster technology; however, you may be able to achieve a modest but noticeable improvement by tweaking Windows' modem and network settings.

♦ **Tweak like a geek:** Buried deep in the Windows Registry are numerous arcane settings that control the way your PC sends and receives data. Most of these settings aren't worth changing. Two of them, however—the MaxMTU and the Receive Window (RWIN) settings—*are* worth the effort. Windows' default setting for MaxMTU is 1500—a level that is appropriate for high-speed cable or DSL connections. If you are using a dial-up modem, however, we recommend lowering this value to 576. To find the optimum RWIN settings for your connection and additional technical detail on other network-related Registry settings, consult the Navas Cable Modem/DSL Tuning Guide at find.pcworld.com/30223, and DSLreports' Tweak Tester II at find.pcworld.com/30224.



Internet
Connection Optimization
File Optimization Wizard View Purchase / Register Help
Optimization Wizard
Maximum Transmission Unit (MTU)
Interface
MTU Automatic
MTU Probe
TCP Receive Window
RWIN Windows Default
Other Settings
Time To Live 128
Selective acknowledgement
"Black Hole" Routers Detection
Path MTU Discovery
RFC 1323 window scaling
RFC 1323 timestamps
Max. connections per server
To HTTP 1.0 Servers
To HTTP 1.1 Servers
Backup To File
Load Original Settings
Restore From File
Windows Defaults
? Help

FIGURE 5: TweakMaster speeds up your Internet access by changing important Windows Registry settings.

If you're feeling adventurous, you could use Windows' Registry Editor utility to change your settings manually. But be warned: The manual route can prove to be a time-consuming and dangerous process. A much safer and easier way is to use Hagel Technologies' $20 TweakMaster, a handy utility that will automatically change MaxMTU, RWIN, and other settings for you (see **FIGURE 5**). Go to find.pcworld.com/30225 to download a trial copy of the program.

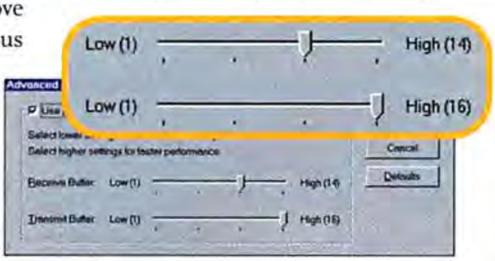
♦ **String up your modem:** You can control your analog modem by modifying its initialization string in Windows. Some modems need a specific string to enable special features and optimize performance. If you've installed the latest version of your modem's driver, you shouldn't have to worry about altering the string—it is added automatically.

To check your modem's driver version and initialization string (if any) in Windows 98 and Me, first right-click *My Computer*, select *Properties*, and click the *Device Manager* tab. To get to Device Manager in Windows 2000 and XP, choose the *Hardware* tab and click *Device Manager*. Now double-click *Modem* (98/Me) or *Modems* (XP/2000), and double-click the entry for your modem. You'll find the version number on the Driver tab of your modem's Properties dialog box, and the initialization string in the Extra Settings box (in Windows 98 and Me) or under the Advanced button on the Connections tab (in Windows XP/2000).

♦ **Pump up the pulse:** You can shorten the time it takes to dial your ISP by adding the string **ats11=50** to the Extra Settings box. This shortens the dial tone pulse to 50 milliseconds.

♦ **Raise the speed limit:** While you're in the Modem Properties dialog box, check the Maximum Port Speed setting under the Modem tab. Too low a number can inhibit data flowing into your PC and slow your connection speed. If Maximum Port Speed isn't already set to 115200, try increasing it one setting at a time and looking for a change in performance.

You can also experiment with the modem's buffer sizes for receiving and transmitting data. To find them, choose the *Advanced* button on either the *Connections* tab (in Windows 98 and Me) or the *Advanced* tab (in Windows 2000 and XP). Start by setting both receiving and transmitting to their maximum value (14 and 16, respectively), and then back them off until you find the optimum settings for your PC (see **FIGURE 6**).



Advanced

Select higher settings for faster performance

Receive Buffer: Low (1) High (14)

Transmit Buffer: Low (1) High (16)

Cancel
Defaults
Low (1) High (14)
Low (1) High (16)

FIGURE 6: Download files faster by adjusting the size of your modem's buffers.

♦ **Web accelerators that work:** A number of Web accelerator services actually do speed up connections. For the ones we like, read the review in this month's *New Products* on page 80. ■

Kirk Steers is a contributing editor for **PC World.**

Easy Outlet for Networking

GigaFast offers reliable, secure solution over conventional wiring.

Networking for small business users and homes is now as easy as plugging into an electrical wall outlet. The HomePlug USB Adapter from GigaFast (www.gigafast.com) gives users bandwidth up to 14 Mbps over standard AC wiring and takes literally minutes to set up with simple instructions and no additional wiring. HomePlug USB Adapter allows desktops and notebooks to plug directly into any wall outlet to share Internet connections, peripherals, and files, or to play multiplayer games. Unlike wireless networks, GigaFast's HomePlug does not experience compromised reliability due to line-of-site issues; HomePlug has a range of up to 900 feet, regardless of wall or floor construction that can impede wireless networks. In addition, the GigaFast HomePlug environment utilizes sophisticated 56-bit DES encryption (far more secure than competing local area network technologies), which significantly enhances data security.

Click on:
www.gigafast.com
for more information today.

Supplement Sponsor: GigaFast Ethernet

1+1=
easy.
Installing HomePlug™
easier.

PE901-UI
14Mbps USB Adapter

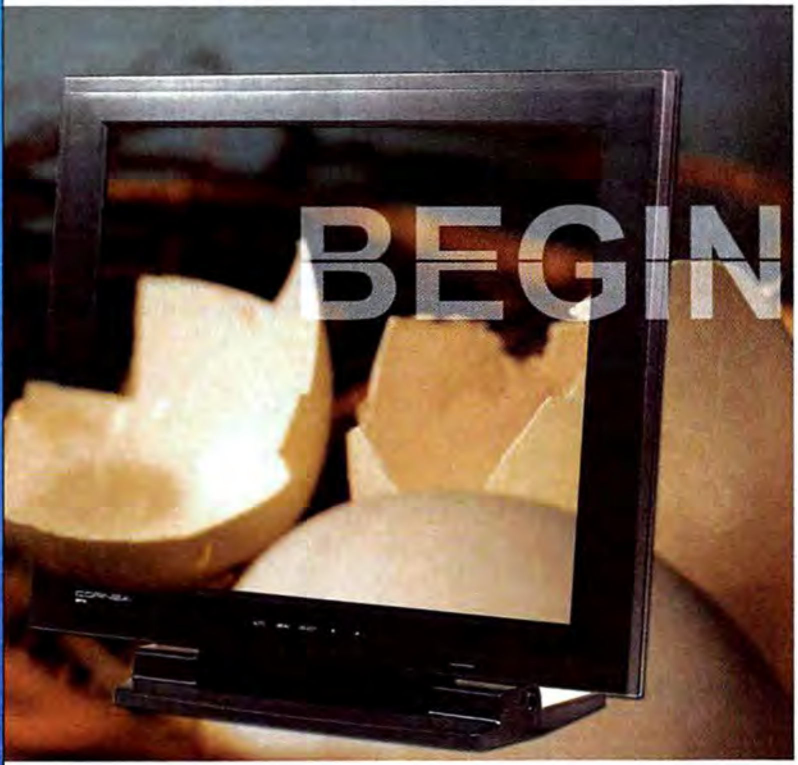
PE902-EB
14Mbps Ethernet Bridge

GigaFast HomePlug™ Technology
Smaller, Faster, Easier

GIGAFAST ETHERNET

Proud member of the HomePlug Powerline Alliance

CORNEA™
SYSTEMS, INC.



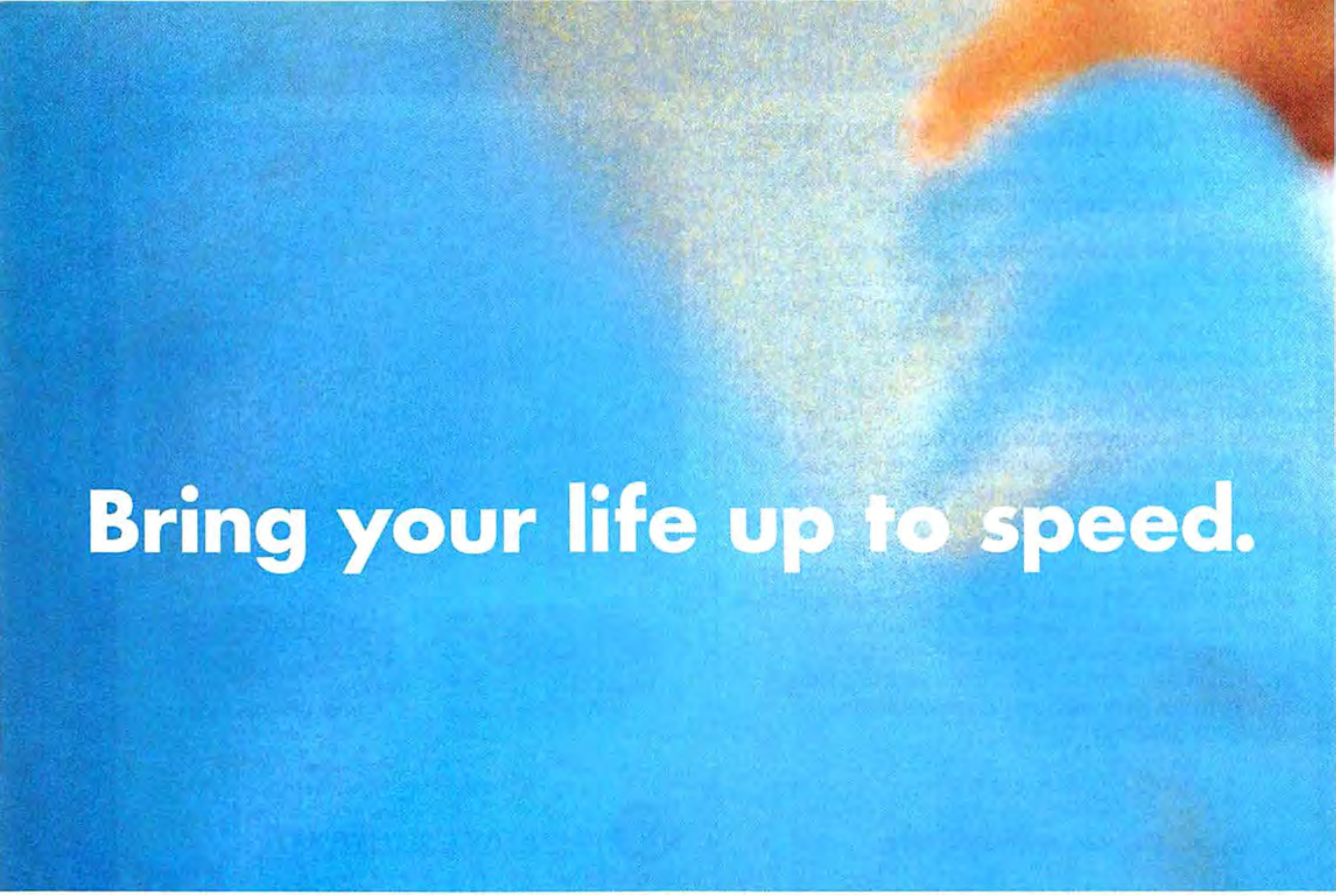
Break into the new BEGINNING

Purchase one of Cornea's top sellers, the MP704 TFT-LCD monitor, between 12/01/02 and 01/31/03 and receive a

$50 mail-in rebate!

To download a rebate claim form, please visit http://www.corneasystems.com/rebates.php

TERMS AND CONDITIONS-Offer valid on purchase of specified product(s) only and is not valid with other offer. Limit ONE redemption (per model) per individual/name, household, or address. Submit this rebate form completely filled out with a copy of the sales receipt, and original UPC label from package. Incomplete forms will be denied. Your request must be postmarked prior to 2/15/03. Manufacturer is not responsible for lost or misdirected mail. Rebate value will not exceed purchase price. Requests with invalid or undeliverable mailing address will be denied. Offer limited to end-users only. Your rebate rights cannot be transferred, and this offer is void where taxed, restricted or prohibited by law. This offer is valid in US and Canada only. Keep copies of all materials submitted: originals become Manufacturer's property and will not be returned. Warning: Fraudulent submission could result in federal prosecution under mail fraud statutes (Title 18, USC Sections 1341 & 1342). This offer is no longer valid if not fully redeemed within 6 months from the close of the rebate period.



Keep track of your accounts with one click. Review appointments while you listen to MP3s. Catch up on e-mail as you're downloading digital photos. Just get one of these PCs with Microsoft® Windows® XP Home Edition and you'll speed through your to-do list. To get yours, buy direct.

Quick Shop
Please enter the item's Quick Shop Code, and you will go directly to that product.

Shown with HP mx 75 monitor.

hp pavilion 743 desktop pc

Quick Shop Code: QS-15F

$819

- Intel® Pentium® 4 processor 2.4 GHz
- Microsoft® Windows® XP Home Edition
- 128MB DDR SDRAM
- 40GB Ultra DMA Hard Drive†
- 48X Max CD-ROM Drive‡
- HP v70s 17" monitor 15.9" VIA (not shown)
- 6 USB 2.0 ports

Just add:

- Upgrade to 60GB Ultra DMA Hard Drive: Add $20
- Upgrade to 256MB DDR SDRAM: Add $35
- HP CD-Writer Drive in 2nd bay: Add $90

hp PCs use genuine Microsoft® Windows®
www.microsoft.com/piracy/howtotell

hpshopping.com is a subsidiary of Hewlett-Packard.

Prices shown refer to hpshopping.com selling prices and do not include applicable sales tax and shipping, are valid in the U.S. only and are subject to change or cancellation without notice. Products, prices and availability subject to change without notice. See hpshopping.com for more details. Illustrations may not accurately represent exact configurations priced. Retail prices may vary. HP is not liable for editorial, pictorial or typographical errors in this advertisement. †For hard drives, GB=billion bytes. ‡48X Max CD-ROM data transfer rates may vary from 2500 to 7200 Kbps. **40X CD-RW Drive data transfer rates may vary as follows: for recording to CD-R media, the max transfer rate may be up to 6000 Kbps (use 40X discs for best performance); for writing to CD-RW media, the max transfer rate may be up to 1800 Kbps (use 4X-12X high-speed media discs for best performance); for reading CD media, the max transfer rate may be up to 6000 Kbps. Actual transfer rates may vary depending on media quality. ††16X DVD-ROM Drives read a minimum of 5545 Kbps and a maximum of 21640 Kbps. ‡‡$100 notebook mail-in-rebate offer good on purchases made between 9/22/02 and 2/23/03 on qualifying HP Pavilion Notebook PCs. $50 printer bundle mail-in-rebate offer good on purchases made between 10/6/02 and 1/4/03 on qualifying HP Pavilion Notebook PCs or qualifying Desktop PCs and qualifying Monitors. Products purchased before or after these dates are not eligible for this offer. Purchase date is determined by invoice or receipt date. These offers are combinable with other HP offers. Offers not valid on

hp pavilion 753 desktop pc

Quick Shop Code: QS-162

$1,149

- Intel® Pentium® 4 processor 2.53 GHz
- Microsoft® Windows® XP Home Edition
- 512MB DDR SDRAM
- 80GB Ultra DMA Hard Drive†
- 40X Max CD-RW Drive**
- 16X Max DVD-ROM Drive††
- HP v70s 17" monitor 15.9" VIA (not shown)
- 6 USB 2.0 ports

Just add:

- Upgrade from HP CD-Writer Drive to DVD Writer Plus Drive: Add $200
- HP Deskjet 3820 Printer: Add $49.99 (after $50 bundle mail-in rebate)''

hp pavilion ze4000 notebook pc

Quick Shop Code: QS-159

$849

($949-$100 mail-in rebate = $849)''

- Intel® Celeron® 1.6 GHz
- Microsoft® Windows® XP Home Edition
- 128MB DDR SDRAM
- 20GB Hard Drive†
- 24X Max CD-ROM Drive
- 14.1" XGA TFT Display

Just add:

- DVD Drive: Add $50
- 15" screen or 256MB RAM: Add $75
- HP Deskjet 5550 Printer: Add $149.99 (after $50 mail-in rebate)''

hp pavilion ze4000 notebook pc

Quick Shop Code: QS-15C

$999

($1,099-$100 mail-in rebate = $999)''

- Mobile Intel® Pentium® 4 Processor - M 1.7 GHz
- Microsoft® Windows® XP Home Edition
- 128MB DDR SDRAM
- 20GB Hard Drive†
- DVD Drive
- 14.1" XGA TFT Display

Just add:

- DVD-CDRW Combo Drive: Add $100
- USB optical travel mouse: Add $49.99

Buy direct from hpshopping.com:
call 1-866-288-7841 or click hpshopping.com/pcworld
or visit your local retailer.

invent

---

refurbished HP products. Offers are limited to product on hand, and NO substitutions with other products are eligible. Keep copies of materials submitted; originals become HP property and will not be returned. HP reserves the right to request additional information regarding this claim. False information disqualifies this claim, making it subject to review under U.S. postal regulations or Canadian law. Violators may be prosecuted. Only purchases made by an end-user customer or a commercial business from an authorized HP reseller in the United States, Canada and their territories are valid. Purchases by HP resellers and internal HP orders are ineligible. Offer void where prohibited, taxed or restricted by law. If you have any questions regarding this offer, please call the HP Awards Center at 1-800-728-9665 from 7:00am through 6:30pm, CT, 7 days a week. Intel® Pentium® 4 processor speed denotes maximum performance mode on AC power; processor speed on battery power is approximately 64% of maximum performance mode. Intel, the Intel Inside Logo, Pentium and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the U.S. and other countries. AMD, AMD Athlon, PowerNow! and combinations thereof are trademarks of Advanced Micro Devices, Inc. Microsoft, MS and Windows are registered trademarks of Microsoft Corporation. Products and company names mentioned herein may be trademarks and/or registered trademarks of other companies. hpshopping.com is a subsidiary of Hewlett-Packard. © 2003 Hewlett-Packard Company.

hw=wh

(**hostway** is **web hosting**)

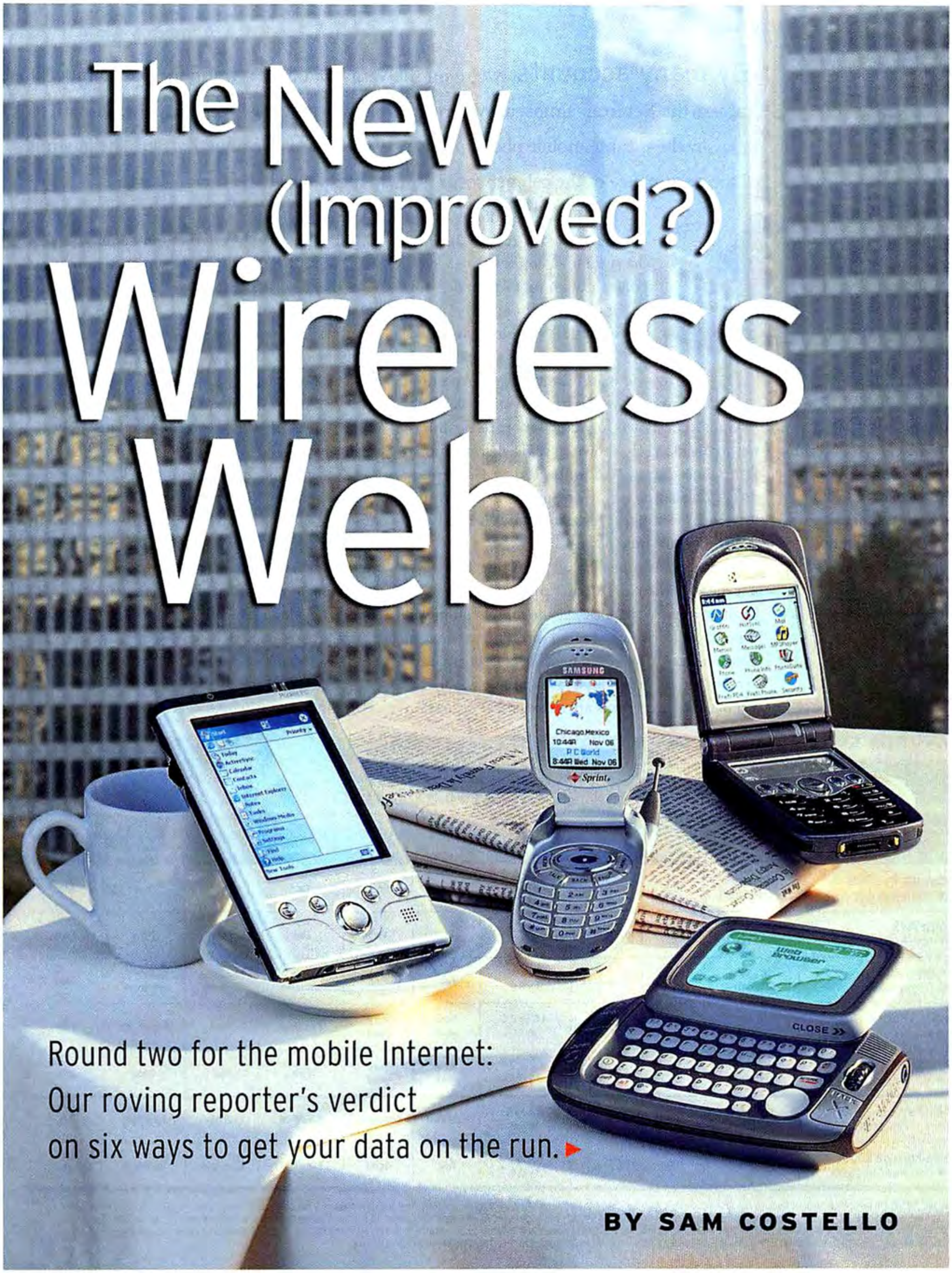
It's that simple.

When it comes to web hosting the simple things matter the most - usability, dependability and value. At Hostway, we're always working to make web hosting easier to use, more reliable and affordable to our customers. It's no wonder that we have become synonymous with web hosting itself, receiving the highest accolades year after year, for being the best in our industry. For more information about Hostway, contact us at **1-866-HOSTWAY** or visit us online at **www.hostway.com/pcworld.**

HOSTWAY
The Hosting Company

web hosting **ecommerce** **dedicated servers** **resellers** **1.866.HOSTWAY (467.8929)** **sales@hostway.com**

The New (Improved?) Wireless Web


SAMSUNG
Chicago Mexico
10:44A Nov 06
P C World
8:44A Wed Nov 06
Sprint
Web Browser
CLOSE >>

Round two for the mobile Internet: Our roving reporter's verdict on six ways to get your data on the run. ▸

BY SAM COSTELLO

PHOTOGRAPHS BY KEVIN CANDLAND

ONLINE ANYTIME: Toshiba's Portégé 2000 laptop can get connected with either its built-in 802.11b chip or the Samsung A500 phone, which uses Sprint's PCS Vision 3G wireless Internet service.

By many accounts, we're on the verge of a data revolution, and soon we'll access the Net from almost anywhere. In what was previously the exclusive domain of pay-by-the-minute mobile phone plans, new wireless-data competitors are challenging the dominance of the cell networks for fast, inexpensive, on-the-go service.

New third-generation wireless phone networks (called 3G services) promise to bring brisk Web access through mobile phones, for the first time. Though the prior wave of data-enabled (so-called 2G) phones were sluggish and costly, the world has changed. And mobile phones have a new rival, a networking standard designed for stationary wireless Internet access: 802.11b, known as Wi-Fi, delivers much faster Web access and downloads than 3G services do (as long as you stay in one place), though it suffers from low range. The best part is, Wi-Fi service can be free, in some places.

My goal was simple: I wanted to know how easy it is to get to the real Internet, anywhere. I want to be able to send a text message the minute I think of something important, to find directions as I walk down the street, and even to make or confirm travel reservations while I'm in a cab on the way to the airport. (My test results are summarized below.)

My testing took me outdoors into the streets of Philadelphia, wandering through neighborhoods while squinting at tiny LCD screens. I browsed Web sites like MSNBC.com and PCWorld.com; I got directions from MapQuest, and took Orbitz for a spin booking travel reservations. I sent e-mail and instant messages from coffee shops. I also tried my hand at shopping, from Amazon.com and EBay.

I tested a representative sample of the devices and wireless networks you can use today. Handspring's Treo 300 (which uses the Sprint network) and Kyocera's 7135 (which uses AT&T's service) are Palm OS–based 3G wireless PDA/phones. Samsung's A500 phone permits limited Web browsing on the device itself and can function as a USB modem for any laptop. Toshiba's E740 Pocket PC PDA offers built-in 802.11b wireless networking. T-Mobile's Sidekick is a kind of mutant PDA that brings a phone and 3G Internet service along for the ride. I also tested a laptop that could connect using both 802.11b and the Samsung phone.

Of all the handhelds I tested, I really enjoyed

FEATURES COMPARISON

WIRELESS DEVICES: TOOLS TO SURF FROM ANYWHERE

PRODUCT	Device type and network	Price¹ (11/1/02)	Weight	Size (L by W by D, inches)	Performance and task test results					
					Speed	Messaging	Directions	E-commerce	Airline reservation	Phone quality
Handspring Treo 300 ★★½☆☆ www.handspring.com	3G Palm OS phone (Sprint)	$500	5.2 ounces	4.3 by 2.7 by 0.7	Fair	Good	Fair	Poor	Poor	Fair
Kyocera 7135 ★★½☆☆ www.kyocera.com	3G Palm OS phone (AT&T)	$600	6.6 ounces	4 by 2.4 by 1.2	Fair	Good	Fair	Poor	Poor	Fair
Samsung A500 ★★☆☆☆ www.samsung.com	3G phone (Sprint)	$300	3.6 ounces	3.5 by 2 by 0.8	Fair	Fair	Unable to perform	Unable to perform	Unable to perform	Good
T-Mobile Sidekick ★★★★☆ www.t-mobile.com	3G hybrid phone (T-Mobile)	$250	6.0 ounces	4.6 by 2.6 by 1.1	Very good	Very good	Excellent	Good	Acceptable	Fair
Toshiba E740 ★★★☆☆ www.toshiba.com	Pocket PC with Wi-Fi	$600	6.1 ounces	4.9 by 3.1 by 0.6	Very good	Very good	Fair	Fair	Good	n/a
Toshiba Portégé 2000 ★★½☆☆ www.toshiba.com	Notebook with Wi-Fi	$1918	2.6 pounds	11.4 by 9 by 0.6	Excellent	Excellent	Excellent	Excellent	Excellent	n/a
Toshiba Portégé 2000 ★★★☆☆ www.toshiba.com	Notebook with 3G phone	$1918	2.6 pounds	11.4 by 9 by 0.6	Fair	Good	Excellent	Excellent	Excellent	n/a

HOW WE TEST: We devised a suite of tests to run on each device. We also tested the devices' speed by timing how long they took to load the front pages of PCWorld.com, MSNBC.com, and Heavy.com. To test messaging features, we used each device to send and receive e-mail and instant messages over AOL Instant Messenger. To evaluate online shopping, we placed an order on Amazon.com or bid on an EBay auction item. We also tried to check or make flight reservations on Expedia.com and Orbitz.com, and to get directions using MapQuest.com. Finally, we tested the quality of calls on the phone devices. n/a = Not applicable; device has no phone capability. ¹ List prices for hardware only; monthly service charges extra.

using the Sidekick. Combining compact size, high-speed Web browsing, and intuitive ease of use with a reasonably good pricing plan for 3G wireless data, the Sidekick offers the best all-around package for mobile communications. Check with T-Mobile before you buy a Sidekick to make sure there's coverage in your area.

FIND YOUR NETWORK

BEFORE YOU PICK a device, you must make sure you can use it where you want to. Mobile phone devices offer the widest blanket of service, thanks to the ubiquity of cell phone coverage in cities and along highways. You might have difficulty in (or between) smaller towns, or in pockets of radio dead spots between hills or near steel-framed buildings.

By contrast, there's no guarantee that you'll find an 802.11b wireless network anywhere you happen to be. But places that cater to business travelers, such as hotels and airports, are starting to provide free Wi-Fi service as a courtesy. Many Starbucks locations offer a coffee-shop WiFi network (costing from $3 for 15 minutes to $30 a month). Other retail chains will soon follow suit.

I also "borrowed" Wi-Fi service from complete strangers. Many Wi-Fi installations in homes and small businesses provide open access (sometimes unintentionally) to any nearby computer. (For more on this phenomenon, see the sidebar, "Surf Wi-Fi Free—For Now," page 136.)

3G IS FAST, BUT WI-FI IS FASTER

WI-FI OFFERS THE FASTEST downloads. But for mobile users, speed isn't necessarily everything.

If you normally compute by staying in one place for a while, Wi-Fi's high speed makes it the preferred option. Using the Toshiba laptop's built-in 802.11b in a Wi-Fi–enabled café or bookstore is as close as you can get to broadband speeds without actually signing up for a cable or DSL modem.

But if you're always on the move, and you can't get tied to a particular location, the slower 3G networks might work better for you. That's because Wi-Fi can't smoothly "hand off" to the nearest access point if you wander beyond the radio range (an average of 300 feet) of the one you're using.

The 3G networks let you surf at approximately the same speed as you would on a 56-kbps analog modem—fast enough for short messaging, but (in most cases) still too slowly for browsing many Web sites. The one exception: the Sidekick (on its 3G network) surfed faster than other phone-network devices because phone providers who sell its service also optimize its Web content downloads.

Samsung's A500 phone failed to load any of the test sites because its browser can view only Web pages specially made for the phone. To its credit, the A500 loaded a number of the sites designed for it in less than 30 seconds each. Unfortunately, far too few of these special links exist. The A500 also performed decently (though at sub-broadband speeds) as a laptop modem, loading MSNBC.com and PCWorld.com in less than a minute each.

MESSAGING ON THE GO

USING A PHONE KEYPAD for text messaging can be generously described as laborious. If you send a lot of messages, look for devices with a keyboard, such as the Sidekick or Handspring Treo. The software keyboards in Palm and Pocket PC devices are less preferable, but will work in a pinch.

Writing e-mail and instant messages on the Sidekick is quick and easy, thanks to the device's smart design, which lets you hold it as you would a video game controller and then type using your thumbs. An e-mail app (which can check any standard POP3 e-mail in-box) and AOL Instant Messenger come preinstalled on the device. Several customizable stock responses in the device let you send "Got your message" or "Can't type now; the bus is bouncing too much" with just a few quick turns of the thumbwheel.

Instant-messaging addicts, take note: The AOL Instant Messenger application, which is a free download for the PC and comes included with the Sidekick, will cost you about $20 to download in either the Palm OS or Pocket PC version.

FIND YOUR WAY

SOMETIMES, ROAD WARRIORS just need a map. I threw MapQuest at all the devices to see where it stuck best. The mapping Web site provides a PDA-specific section built for the smaller screens and memory requirements of palmtops.

The Sidekick stood out from the rest of the pack on the mapping test thanks to its screen, which rotates to cover the keyboard and prevents accidental key presses. Being able to stick the Sidekick in your pocket and take it out to glance at its high-resolution display en route makes it nearly as good as a pad of paper for following directions.

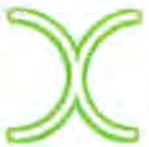
The other devices were able to quickly gather text directions to the destination—but forget about ▶

KYOCERA'S 7135 hybrid phone/PDA adequately tackles messaging but loads Web pages slowly.

T-MOBILE'S Sidekick is an all-around data champ, with a smooth interface and strong messaging and Web browsing features. Its only weakness: It's poorly designed as a phone, and its plan provides relatively few talk minutes (but data time is unlimited).

FREE ACCESS

Surf Wi-Fi Free–For Now



THIS symbol means free 11b.

IN MOST MAJOR cities, numerous 802.11b wireless networks crisscross neighborhoods and office parks without their Wireless Equivalent Privacy (WEP) security features enabled. This state of affairs allows any Wi-Fi enabled device–including yours–to go online.

Windows XP makes it easy to sneak onto a network with its built-in wireless network detector, and other operating systems can run NetStumbler (find.pcworld.com/32162) to find networks. The programs all work by tuning your wireless card to a mode that allows it to listen to and collect the names of every other wireless card and access point within range. You can then turn your card back on and use this information to connect to the Wi-Fi networks you found.

But there's a legal and moral gray area here. Gaining unauthorized access to computer networks is a crime in many states. That's exactly what you're doing when you borrow someone else's Wi-Fi network–even if the owner leaves it wide open.

"It is probably not ethical for someone to connect to a wireless network unless they know it has been left open for public access," says Dennis Eaton of the Wi-Fi Alliance. But not everyone agrees.

Free-bandwidth advocates have been busily war chalking–marking symbols on sidewalks or buildings to indicate the availability of Wi-Fi Internet access–and mapping those locations worldwide.

For now, borrowing someone else's Wi-Fi network to surf the Web isn't a crime, but take care not to expose your sensitive data. And if you own an access point, be aware that others may, at some time, try to use it if you don't lock it down with WEP.

TOSHIBA'S E740 Pocket PC (right) offers built-in Wi-Fi in a sleek package.

HANDSPRING'S Treo 300, a Palm/phone hybrid, features a clear screen cover so you can read the display even when the lid is closed.

reading map images. Even at the highest zoom levels, the street names in the MapQuest map graphics more closely resembled ancient Sumerian cuneiform than readable letters or words in plain American English.

If you get lost and your only device is the Samsung A500 phone, your best bet is to use it to call for a taxi. The phone can't download maps or directions.

THE CHORE OF MOBILE SHOPPING

PART OF THE PROMISE of the wireless Web is mobile commerce, but only a few of the devices I evaluated were up to the task. To test them, I tried to buy a book and to make airline reservations.

Despite the A500's other flaws, Samsung made linking to Amazon.com amazingly easy with the phone, thanks to a specially formatted version of the Amazon site. The Sidekick also lets you quickly log in to any site, browse, and buy something.

At the other end of the spectrum, both the Handspring Treo 300 and the Kyocera 7135 utterly failed at shopping or travel reservations. The Treo could not complete a transaction at all, and the Kyocera PDA/phone let me buy a novel only after I dished out large helpings of patience and perseverance, and mortgaged myself for a substantial coffee tab.

PHONE HOME

GOT PHONE? I made a few phone calls with the Handspring Treo, the Kyocera, the Samsung, and the Sidekick, just to see how they'd sound. The small, light, and ergonomic Samsung A500 is the standout here; it's easy to dial numbers or to access the built-in address book one-handed.

The Palm-based designs suffer from a case of severe boxiness. Wider than most cell phones, both devices' touch screens rest against the side of your face when you use the phone.

The Sidekick—about the size of a Hostess pie—is the most oddly shaped of the phones. Though the Sidekick is intended to be used primarily with an included headset, you can simply hold it up to your ear if need be. T-Mobile's Sidekick plan offers the fewest phone minutes of any of the devices I tested, but there's no limit on data calls.

NOT (QUITE) READY FOR PRIME TIME

THE NEAR-TERM future of this just-emerging new generation of wireless-enabled devices isn't rosy. I don't think the perfect wireless device—one that lets you surf, shop, communicate, and stay productive—exists yet. Every choice has some limitations, and users who want to go wireless need to be prepared to deal with them.

For all the improvements that have been made to phone networks and wide Wi-Fi deployment, neither network type offers a truly compelling combination of high speed, low cost, and wide availability. And with the exception of radically different devices like the Sidekick, the hardware still has its own long road to travel before it becomes truly useful for people who need Internet access on the go. ■

Sam Costello is a freelance writer in Bend, Oregon.

IBM
IBM
THE ONE-TWO PUNCH:
RELIABILITY. AFFORDABILITY.

eserver

Winning with UNIX® The new IBM eserver pSeries™ 630. Affordable, yet loaded with key mainframe-like reliability features. Like Chipkill™ memory, which detects and corrects memory errors – making downtime due to memory failure about 100 times less likely.[1] So your apps keep running. For an IDG report on technology's role in advancing your business, or for special financing info, go to **ibm.com**/eserver/p630. Reliability and affordability. As simple as one, two, three.

e business is the game. Play to win.™

---

[1] See IBM study by Timothy J. Dell, "A White Paper on the Benefits of Chipkill-Correct ECC for PC Server Main Memory," dated November 25, 1997, available at the following: http://www.ibm.com/servers/eserver/pseries/campaigns/chipkill.pdf. IBM, the e-business logo, Chipkill, pSeries and *e-business is the game. Play to win* are trademarks or registered trademarks of International Business Machines Corporation in the United States and/or other countries. UNIX is a registered trademark of The Open Group. Other company, product and service names may be trademarks or service marks of others. ©2002 IBM Corporation. All rights reserved.

Lab-tested rankings of the best in PCs, peripherals, and upgrade components

TOP 100

EDITED BY THE REVIEWS STAFF

INSIDE

140 DESKTOP PCs
142 CORPORATE PCs
144 NOTEBOOK PCs
147 19-INCH MONITORS
148 CD-RW DRIVES
149 GRAPHICS BOARDS
150 DIGITAL CAMERAS
151 MORE REVIEWS

144

Top 15 Notebook PCs

The Chem USA ChemBook 4025 (left) and Gateway's 600XL each used a 2.2-GHz Pentium 4-M processor to power through our PC WorldBench 4 tests. Both laptops have 802.11b (Wi-Fi) wireless capability built in.

Mobile Pentium 4 Gets a Boost

Intel's latest mobile processor, a 2.2-GHz Pentium 4-M, makes its debut on this month's *Top 15 Notebooks* chart, in two new portables. Both offer impressive performance: Gateway's 600XL earned a PC WorldBench 4 score of 103, while Chem USA's ChemBook 4025 scored 104. And for once, speed doesn't come at a premium price: At just under $2100, the ChemBook is the least-expensive model on our power list.

Also new this month: In addition to our regular *Top 15 Desktop PCs* ranking, we highlight systems with a definite corporate slant. In our first *Top 5 Corporate PCs* chart, HP's Compaq Evo D510 wins the Best Buy.

Freelance writers Mick Lockey and Carla Thornton, as well as PC World *reviews editors Richard Baguley, Tracey Capen, Seán Captain, Rebecca Freed, Kalpana Narayanamurthi, Melissa J. Perenson, and Alan Stafford, contributed to the* Top 100 *section this month. Ulrike Diehlmann, Julio Giannobile, Elliott Kirschling, Jeff Kuta, Tony K. Leung, and Thomas Luong of the PC World Test Center performed testing on the products reviewed in this section, with logistical support provided by Julian Weatherby.*

PHOTOGRAPHS: MARC SIMON

150

Top 10 Digital Cameras

Small but sophisticated, the 4-megapixel Nikon Coolpix 4300 takes great pictures; it's the Best Buy on the $500-and-over chart.

142

Top 5 Corporate PCs

Gateway's E-6000 (top) and IBM's NetVista M42 sit in the third and fourth spots on our new corporate PCs chart.

149

Top 10 Graphics Boards

Crucial Technology's Radeon 9700 Pro—number two on the chart's power side—is this vendor's first graphics card.

YOUR GUIDE TO THE TOP 100

EACH MONTH WE TEST a large number of PCs, printers, monitors, and other products. Only the best products land on the charts, which are refreshed monthly.

System configurations are shown as tested. The overall rating for each product is calculated on a 100-point scale and reflects results from our hands-on evaluations and performance tests. A 90-point score is exceptional, while one in the 70s is above average.

The PC WorldBench 4 score is a measure of how fast a PC can run a mix of common business applications as compared with our baseline machine, a Gateway Select 1200 with a 1.2-GHz Athlon processor, 128MB of PC133 SDRAM, and a 20GB hard drive. For example, a PC that scores 120 is 20 percent faster than the baseline system. The policies score is based on vendor support policies (not shown on charts). Please see find.pcworld.com/15720 for additional details on how we compile charts for the *Top 100.*

TOP 15 DESKTOP PCs

	POWER SYSTEM	Overall rating	Street price (10/18/02)	PC WorldBench 4 performance score[1] Faster	Comments
1	**Best BUY** **Dell Dimension 8250** find.pcworld.com/31313	85	**Very expensive** $3158	Windows XP Home Good 121	Pricey model includes an excellent 21-inch monitor and a DVD+RW/+R drive that supports writing to 4X DVD+R media. (★★★★☆ Dec 02)
2	**Gateway 700X** find.pcworld.com/29921	83	**Very expensive** $3024	Windows XP Home Good 121	Powerful configuration offers 1GB of memory, a DVD-RAM/-R drive and Pinnacle Studio 7 for video editing tasks. (★★★★☆ Sept 02)
3	**ABS Conquest SP** find.pcworld.com/30734	83	**Very inexpensive** $1985	Windows XP Professional Good 121	Generic-looking system offers strong performance and Microsoft Office XP SBE at a reasonable price. (★★★★☆ Nov 02)
4	**Polywell Poly 875VF-2800** NEW find.pcworld.com/31970	83	**Expensive** $2795	Windows XP Home Outstanding 130	High-priced unit delivers exceptional speed and, with dual hard drives, massive storage, but its 18-inch LCD is not as impressive. (★★★★☆)
5	**Sys Technology Performance 2800** find.pcworld.com/30758	81	**Average** $2659	Windows XP Professional Outstanding 129	Second-fastest PC on chart includes a CompactFlash and SmartMedia card reader and a sharp-looking LCD monitor. (★★★★☆ Nov 02)
6	**IBM NetVista A30p** find.pcworld.com/31262	81	**Expensive** $2713	Windows XP Professional Good 119	Pricey system offers a high-quality CRT monitor. Cramped interior has limited room for expansion, though. (★★★½☆ Dec 02)
7	**FreewayTech Velocity A333** NEW find.pcworld.com/31967	78	**Inexpensive** $2059	Windows XP Professional Good 119	Fine balance of performance and price, plus a wireless mouse and keyboard, but fewer usable USB ports than in most PCs. (★★★★☆)
	Percent of overall rating ▶		10 percent	25 percent	

	VALUE SYSTEM	Overall rating	Street price (10/18/02)	PC WorldBench 4 performance score[1] Faster	Comments
1	**Best BUY** **ABS Bravado 2300** find.pcworld.com/30275	89	**Very inexpensive** $1049	Windows XP Home Good 115	Solid performance for the money; the included CRT monitor displays sharp text but muted colors. (★★★½☆ Oct 02)
2	**Micro Express MicroFlex 2100A** find.pcworld.com/28761	86	**Average** $1399	Windows XP Professional Outstanding 128	Bargain PC has blazing speed thanks to its motherboard's overclocked CPU (the default setting). Monitor is top-notch. (★★★½☆ Aug 02)
3	**Dell Dimension 4550** NEW find.pcworld.com/31976	85	**Average** $1479	Windows XP Home Fair 107	A middling performer, this model has an easy-to-navigate chassis and a matching LCD that provides crisp text and bold colors. (★★★½☆)
4	**Compaq Presario 6000** find.pcworld.com/31322	84	**Inexpensive** $1266	Windows XP Home Good 116	Software such as Pinnacle Studio 7 (for video editing) and Norton Internet Security makes this PC a good deal. (★★★☆☆ Dec 02)
5	**NuTrend Centra 2** find.pcworld.com/30749	82	**Inexpensive** $1145	Windows XP Home Good 117	This low-cost, bare-bones machine wrings impressive performance from a 2.26-GHz processor. (★★★½☆ Nov 02)
6	**Sys Technology Performance 2000+** find.pcworld.com/31280	82	**Inexpensive** $1257	Windows XP Home Good 119	Fast, basic system offers plenty of room for upgrades. Monitor and sound quality are mediocre. (★★★½☆ Dec 02)
7	**Polywell Poly 884RF-2600** NEW find.pcworld.com/31982	82	**Average** $1599	Windows XP Professional Very good 124	Strong performer with an adequate 15-inch LCD monitor; the system's interior could be easier to navigate. (★★★½☆)
8	**FreewayTech Velocity 135** find.pcworld.com/30782	82	**Very inexpensive** $1069	Windows XP Home Fair 112	Inexpensive model provides a plentiful array of ports, including S/PDIF for attaching digital audio components. (★★★½☆ Nov 02)
	Percent of overall rating ▶		20 percent	20 percent	

Go to find.pcworld.com/10860 for details on *PC World's* Star Ratings.

[1] Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. For more details, see "Your Guide to the Top 100" on page 139.

[2] In gigabytes.

[3] Vertical cases are towers (over 20 inches), midsize towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Horizontal cases are desktops (5 inches or taller) or compacts (under 5 inches). All-in-one PCs integrate a system and a monitor.

DELL'S FULLY LOADED Dimension 8250 tops our power PCs list this month, despite its $3000-plus price. With a 2.8-GHz Pentium 4 CPU, a 120GB hard drive, and both DVD+RW and DVD-ROM drives, there's not much more this machine could offer—making it a top choice for gaming, video editing, or any other task that needs raw processing power. This model also included a 21-inch monitor that produced great-looking images, as well as a terrific-sounding speaker set.

Two new systems also earn spots on the power side, but for very different reasons. The 2.8-GHz Pentium 4–based Polywell Poly 875VF-2800 proved to be a formid-

PHOTOGRAPH: RICK RIZNER

Visit find.pcworld.com/32117 for reviews of all products tested this month and ranked in this chart.

BASE CONFIGURATION						Extra features	Graphics quality	Setup and ease of use	Vendor's reliability/ service
CPU	RAM (MB/type)	Hard drive [2]	Monitor	Graphics	Case type [3]				
2.8-GHz Pentium 4	512/ PC1066 RDRAM	120	21-inch CRT	128MB ATI Radeon 9700 Pro	Midsize tower	**Outstanding:** 16X DVD-ROM drive, DVD+RW/+R drive, V.92 modem, network adapter, Microsoft Office XP Small Business Edition	**Outstanding**	**Very good**	**Good/Fair**
2.53-GHz Pentium 4	1024/ PC800 RDRAM	120	18-inch LCD	128MB GeForce4 Ti 4600	Midsize tower	**Very good:** DVD-RAM/-R drive, 48X/24X/48X CD-RW drive, V.92 modem, network adapter, Microsoft Office XP Small Business Edition	[4]	**Very good**	**Fair/Fair**
2.53-GHz Pentium 4	512/ DDR266 SDRAM	120	15-inch LCD	128MB EVGA E-GeForce4 Ti 4400	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, V.92 modem, network adapter, Microsoft Office XP Small Business Edition	**Fair**	**Very good**	**Fair/Good**
2.8-GHz Pentium 4	512/ DDR400 SDRAM	240	18-inch LCD	128MB Gainward GF4 Ti 4600	Midsize tower	**Fair:** DVD-RW/-R drive, V.90 modem, network adapter	**Outstanding**	**Good**	[5]/[5]
2.8-GHz Pentium 4	512/ PC1066 RDRAM	80	18-inch LCD	64MB Leadtek WinFast A170 DDR T	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, V.92 modem, network adapter, memory card reader, Corel WordPerfect Office 2002	**Fair**	**Good**	[5]/[5]
2.8-GHz Pentium 4	512/ DDR266 SDRAM	120	17-inch CRT	128MB GeForce4 Ti 4200	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, V.90 modem, network adapter, Microsoft Works Suite 2003, Lotus SmartSuite Millennium	**Very good**	**Fair**	**Good/Fair**
1.8-GHz Athlon XP 2200+	1024/ DDR333 SDRAM	120	19-inch CRT	128MB Gainward GF4 Ti 4600	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, network adapter, Microsoft Office 2002 Small Business Edition	**Very good**	**Good**	[5]/[5]
10 percent						10 percent	15 percent	5 percent	25 percent

BASE CONFIGURATION						Extra features	Graphics quality	Setup and ease of use	Vendor's reliability/ service
CPU	RAM (MB/type)	Hard drive [2]	Monitor	Graphics	Case type [3]				
1.6-GHz Athlon XP 1900+	256/ DDR333 SDRAM	60	17-inch CRT	64MB GeForce4 MX 460	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, V.92 modem, network adapter, Corel WordPerfect Office 2002	[4]	**Very good**	**Fair/Good**
1.73-GHz Athlon XP 2100+	512/ DDR333 SDRAM	100	17-inch CRT	64MB Gainward GeForce3	Midsize tower	**Very good:** DVD-RAM/-R drive, 32X/10X/40X CD-RW drive, V.90 modem, network adapter	[4]	**Fair**	[5]/[5]
2.4-GHz Pentium 4	256/ DDR333 SDRAM	80	15-inch LCD	128MB ATI Radeon 9700	Midsize tower	**Very good:** 16X DVD-ROM drive, 48X/24X/48X CD-RW drive, V.92 modem, network adapter, Microsoft Works Suite 2002	**Fair**	**Good**	**Good/Fair**
1.8-GHz Athlon XP 2200+	256/ DDR266 SDRAM	80	17-inch CRT	64MB MSI G4MX420-T	Minitower	**Very good:** 16X DVD-ROM drive, 40X/12X/40X CD-RW drive, V.92 modem, network adapter, Microsoft Works 6.0	**Fair**	**Good**	**Fair/Poor**
2.26-GHz Pentium 4	256/ PC1066 RDRAM	80	17-inch CRT	64MB Leadtek WinFast A170 DDR T	Midsize tower	**Good:** 16X DVD-ROM drive, V.92 modem, network adapter, omnidirectional microphone, Corel WordPerfect Office 2002	**Fair**	**Very good**	[5]/[5]
1.67-GHz Athlon XP 2000+	256/ DDR333 SDRAM	60	19-inch CRT	64MB Leadtek WinFast A170 DDR T	Midsize tower	**Good:** 40X/12X/48X CD-RW drive, V.92 modem, network adapter, Corel WordPerfect Office 2002	**Fair**	**Good**	[5]/[5]
2.13-GHz Athlon XP 2600+	512/ DDR400 SDRAM	82	15-inch LCD	64MB Leadtek WinFast A250	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, V.92 modem, network adapter	**Good**	**Good**	[5]/[5]
2A-GHz Pentium 4	512/ DDR266 SDRAM	60	17-inch CRT	64MB MSI G4MX440-T	Midsize tower	**Good:** 16X DVD-ROM drive, 40X/12X/48X CD-RW drive, network adapter	**Fair**	**Fair**	[5]/[5]
10 percent						10 percent	10 percent	5 percent	25 percent

[4] Based on new testing starting in the November 2002 issue. Insufficient data for systems tested in previous months.

[5] Insufficient data to give a rating.

able performer in our tests, distinguishing itself with the highest PC WorldBench 4 score on the chart. Add in its rewritable DVD drive and roomy 18-inch LCD monitor, and you have a system worth its $2795 price. FreewayTech's Velocity A333 can't match the Poly 875VF-2800's speed; however, it costs about $700 less (it's the second-lowest-priced power PC on the chart), and its performance is adequate not only for general computing needs but also for heavy gaming.

We also have two new systems on the value PCs chart. An average performer ▶

AESTHETIC DESIGN: Dell's Dimension 4550 looks stylish, but it lacks a powerful punch.

COMPUTER SCREEN GRAPHICS: JOHN GODDARD

TOP 5 CORPORATE PCs

	CORPORATE SYSTEM	Overall rating	Street price (10/18/02)	PC WorldBench 4 performance score[1] Faster	Comments
1	Best BUY Compaq Evo D510 Convertible Minitower find.pcworld.com/32009 NEW	81	Expensive $2127	Outstanding 120	Top-notch performer has roomy case; model we reviewed can handle two displays simultaneously. (★★★★☆)
2	Dell OptiPlex GX260 find.pcworld.com/30191	80	Average $1503	Very good 112	The easy-access chassis is preloaded with software to remotely activate the unit's ports, slots, or devices. (★★★★☆ Oct 02)
3	Gateway E-6000 find.pcworld.com/32012 NEW	80	Average $1419	Very good 113	Highly upgradable system with five available PCI slots and four open drive bays (one for hard drive only). (★★★★☆)
4	IBM NetVista M42 find.pcworld.com/32015 NEW	79	Inexpensive $1343	Good 106	Sluggish speed is offset by software tools like Rapid Restore, which can return the system to its original state. (★★★½☆)
5	MicronPC ClientPro 325 find.pcworld.com/32018 NEW	78	Average $1635	Good 110	The only basic beige chassis on the chart came bundled with a 15-inch LCD monitor that displays crisp text. (★★★☆☆)
	Percent of overall rating ▶		20 percent	20 percent	

Go to find.pcworld.com/10860 for details on *PC World*'s Star Ratings.

[1] All corporate PCs were tested with Microsoft Windows XP Professional.

[2] Total capacity.

[3] Vertical cases are towers (over 20 inches), midsize towers (15.5 to 20 inches), or minitowers (under 15.5 inches). Horizontal cases are desktops (5 inches or taller) or compacts (under 5 inches).

with an average price, the $1479 Dimension 4550 will suffice for most tasks; of the systems on the value chart, it comes with the fastest CD-RW drive. The other value newcomer, Polywell's Poly 884RF-2600, costs $120 more, but it's one of the top value performers this month.

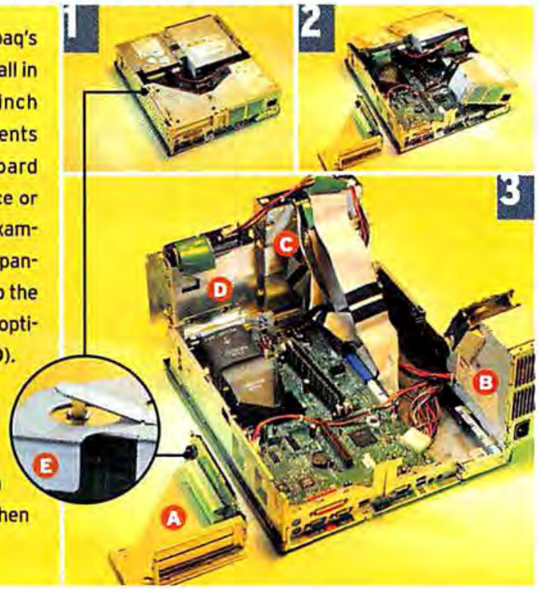
CORPORATE PCs

THE *Top 5 Corporate PCs* chart debuts this month, the second of our specialty-PCs charts. (We reviewed high-end entertainment PCs in our November 2002 issue.) Trading cutting-edge technology for stability, corporate systems usually don't offer the latest components, the best-of-breed speed, or the wealth of upgrade options you'll find in the machines ranked in the *Top 15 Desktop PCs* chart. As their name suggests, corporate systems are targeted at large business environments, where the key concerns are manageability, easy serviceability, and a guarantee that a particular configuration will be available for a year or more. The last concern is crucial for IT departments that are rolling out hundreds or even thousands of matched PCs over a period of months.

TECH TREND

ACCESS AS EASY AS 1-2-3

CLEVER AND SMALL: (1) Compaq's Evo D510 Small Form Factor is all in a tight 13.1-by-14.4-by-3.9-inch space. (2) But major components swing out for easy motherboard access. (3) This lets you replace or repair parts more easily. For example, you can remove the PCI expansion slot carriage (A) and flip up the power supply (B) as well as the optical drive (C) and hard drive (D). But if your fingers shouldn't be inside this system, beware: On top of the slot carriage is a chassis-intrusion detection switch (E), which is triggered when you remove the chassis.



We tested seven new systems from vendors on the corporate buyer's A-list—Compaq, Dell, Gateway, IBM, and MicronPC—and emphasized in our scoring manageability, performance, price, and reliability. We put little or no weight on graphics performance, sound quality, bundled software, or support policies (we de-emphasize support because corporate customers typically have dedicated support teams or establish custom service agreements with their PC suppliers).

Our Best Buy honors go to Compaq for its Evo D510 Convertible Minitower. The configuration we tested, with a 2.8-GHz Pentium 4 CPU, 512MB of 266-MHz DDR SDRAM, and an NVidia Quadro4–based graphics card with dual-monitor support, was the top performer on our chart; plus, its roomy chassis offers flexibility in the event you want to upgrade. However, it's also expensive: At $2127, this Evo is about $500 more than the next-costliest model on the chart.

Corporate PCs were once distinguished by their bland designs—the last plain-beige-box holdouts. Now, however, black and silver are the hot colors, and most vendors—including many of those we review here—offer tower, desktop, and small-form-factor versions of the same model. Usually, these units can stand either horizontally or vertically—a bene-

Visit find.pcworld.com/32114 for reviews of all products tested this month and ranked on this chart.

BASE CONFIGURATION										
CPU	RAM (MB/ type)	Hard drive (GB)[2]	Monitor	Graphics	Case type[3]	Extra features[4]	Platform stability[5]	Monitor quality	Setup and ease of use	Vendor's reliability
2.8-GHz Pentium 4	512/ DDR266 SDRAM	40	17-inch LCD	64MB NVidia Quadro4 200NVS Dual Head	Midsize tower	**Very good:** 12X/8X/32X CD-RW drive, Wake-on-LAN, tool-less drive bay carriers, chassis intrusion detection	Up to 18 months	**Good**	**Good**	**Fair**
2.53-GHz Pentium 4	256/ DDR266 SDRAM	40	15-inch LCD	Integrated Intel 845G using main memory	Midsize tower	**Very good:** 8X DVD-ROM and 8X/4X/24X CD-RW combo drive, Wake-on-LAN, chassis intrusion detection	Up to 18 months	**Good**	**Good**	**Good**
2.4-GHz Pentium 4	256/ PC800 RDRAM	60	17-inch CRT	128MB MSI G4MX440-T	Tower	**Fair:** 24X-48X CD-ROM drive, Wake-on-LAN, tool-less drive bay carriers, chassis intrusion detection	Up to one year	**Very good**	**Outstanding**	**Fair**
2.4-GHz Pentium 4	256/ DDR266 SDRAM	40	17-inch CRT	Integrated Intel 845G using main memory	Desktop	**Good:** 24X-48X CD-ROM drive, Wake-on-LAN, tool-less drive bay carriers, chassis intrusion detection	Up to 18 months	**Outstanding**	**Poor**	**Good**
2.4-GHz Pentium 4	512/ DDR266 SDRAM	20	15-inch LCD	Integrated Intel 845G using main memory	Desktop	**Good:** 48X/12X/48X CD-RW drive, Wake-on-LAN, tool-less drive bay carriers, chassis intrusion detection	Up to one year	**Very good**	**Very good**	**Fair**
15 percent						15 percent		10 percent	5 percent	15 percent

[4] All systems shipped with a network adapter.

[5] Per vendor, the time a given system configuration—including core components such as chip set, CPU, and memory—will be offered from the time of introduction.

fit, given that space is usually at a premium in the business world of cubicles. Of the group we looked at, Compaq's Evo D510 E-pc had the smallest case: It measures 3.8 by 9.8 by 12.2 inches and has a footprint of 46.4 square inches (unfortunately, slow speed and relative lack of expansion options kept it off the chart).

Small cases come with compromises—limited expandability being at the top of the list. Most corporate PCs are never upgraded after purchase; to retain the flexibility to do so, look for larger form factors that incorporate more slots and bays and use full-size PCI cards.

Serviceability, too, can be hindered by the tight arrangement of components. The small corporate systems we tested overcome the limitations of snug quarters with innovative designs; for example, all of them have latches for disengaging the hard drives, making the drives easier to slip in and out. We especially liked the modular design of Compaq's Evo D510 Small Form Factor, which provides unusually easy access to all components: Lift up its large latch, and the hard drive and CD-ROM drive extend upwards.

TOP 5 ENTERTAINMENT PCs

find.pcworld.com/31025

1 **Best BUY** Gateway 700XL
find.pcworld.com/30746

2 **Best BUY** Xi Computer 4286 MTower
find.pcworld.com/30779

3 Alienware Aurora DDR
find.pcworld.com/30278

4 Falcon Northwest Mach V
find.pcworld.com/30764

5 Voodoo Computers Egad Obsidian Black
find.pcworld.com/30776

From the November 2002 issue

STANDING TALL: The Evo D510 Convertible Minitower from Compaq is the top performer.

Another common feature of corporate PCs is lower-end integrated graphics—although some corporate models, such as our Best Buy, the Compaq Evo D510 Convertible Minitower, do include a dedicated graphics card. With integrated graphics, games like Unreal Tournament are virtually unplayable, and overall performance suffers slightly, as seen in our tests. Be assured, however, that these systems are all fast enough to handle heavy word processing or complex databases and spreadsheets. Fortunately for those who have an eye on hard-core after-hours gaming, most of today's offerings include an AGP slot for adding a graphics card.

How much manageability you need is one of the more difficult corporate-PC buying decisions. All of the computers we tested come with some manageability tools. The Gateway E-4000 and E-6000 systems and the MicronPC ClientPro 325, for example, provide LANDesk client-management software, a relatively basic suite of tools that can inventory hardware and software, diagnose and troubleshoot client-based and remote systems, scan for viruses, and secure networks. Compaq, Dell, and IBM each offer a larger portfolio of management tools that incorporate functionality similar to LANDesk and more; for these companies, the software is designed especially for their systems.

Compaq's Intelligent Manageability suite includes browser-based troubleshooting, detailed inventory management, and tools to keep track of a network's total cost of ownership. IBM offers machine-specific tools such as ImageUltra, which installs a customized image on each system, and Rapid Restore, a utility that IBM says can back up systems and restore hard drives with the push of a button (thanks to a pristine hidden partition stored on each system's hard drive). Dell's OpenManage management software includes its LegacySelect, which allows administrators to remotely activate or deactivate ports, slots, and devices. ▶

PHOTOGRAPH: RICK RIZNER; COMPUTER SCREEN GRAPHICS: JOHN GODDARD

TOP 15 NOTEBOOK PCs

	POWER NOTEBOOK		Overall rating	Street price (10/18/02)	PC WorldBench 4 performance score¹ Faster	Comments
1	Best BUY IBM ThinkPad T30 find.pcworld.com/29898		86	Expensive $2949	Windows XP Professional Good 95	Two-spindle machine has dual pointing devices and integrates Bluetooth and Wi-Fi (802.11b) networking. (★★★½☆ Sept 02)
2	Dell Inspiron 8200 find.pcworld.com/31832	NEW	86	Average $2264	Windows XP Home Good 95	Desktop replacement model has FireWire (IEEE 1394) and a high-resolution screen, but could have better audio-shortcut button design. (★★★☆☆)
3	Gateway 600XL find.pcworld.com/31847	NEW	86	Average $2470	Windows XP Home Very good 103	Huge desktop replacement features a jumbo screen and keyboard. It can hold two optical drives, three batteries, or three hard drives. (★★★½☆)
4	MicronPC TransPort GX3 find.pcworld.com/29897		84	Inexpensive $2200	Windows XP Professional Good 94	A fingerprint reader and a keyboard with loud but impressively deep-traveling keys highlight this stylish blue-and-silver laptop. (★★★½☆ Sept 02)
5	Toshiba Satellite Pro 6100 find.pcworld.com/31829	NEW	84	Average $2599	Windows XP Professional Very good 100	Conservative all-black box includes built-in wireless and a modular bay capable of accommodating an optical drive or a second battery. (★★½☆☆)
6	Toshiba Satellite 1955-S801 find.pcworld.com/30803		83	Average $2399	Windows XP Home Outstanding 109	Detachable wireless keyboard lets you work well back from the 16-inch notebook screen; a wireless mouse is also included. (★★★★☆ Nov 02)
7	Chem USA ChemBook 4025 find.pcworld.com/31835	NEW	82	Inexpensive $2099	Windows XP Home Very good 104	Surprisingly lightweight all-in-one has a full set of traditional connections and a laundry list of extras, but sound quality is poor. (★★★☆☆)
		Percent of overall rating ▶		15 percent	20 percent	

	VALUE NOTEBOOK		Overall rating	Street price (10/18/02)	PC WorldBench 4 performance score¹ Faster	Comments
1	Best BUY Dell Inspiron 4150 find.pcworld.com/31142		82	Average $1777	Windows XP Home Very good 98	An average performer; for an extra $20, it ships with a keychain-size 16MB USB storage drive, in lieu of a floppy drive. (★★★☆☆ Dec 02)
2	IBM ThinkPad R32 find.pcworld.com/31145		81	Average $1699	Windows XP Professional Good 94	This lightweight model has a modular bay, as well as a spacious screen and a comfortable keyboard. Falls $415 in price this month. (★★★½☆ Dec 02)
3	Toshiba Satellite 1905-S301 find.pcworld.com/31154		80	Average $1799	Windows XP Home Very good 98	Battery lasted a whopping 4 hours, 11 minutes. Snazzy design includes integrated Wi-Fi and front-mounted audio controls. (★★★½☆ Dec 02)
4	Micro Express NP1020A find.pcworld.com/31841	NEW	79	Average $1499	Windows XP Professional Very good 103	A cool bluish-silver lid, dedicated audio controls, and a SmartMedia slot highlight this one-bay unit. (★★★☆☆)
5	Gateway 450X find.pcworld.com/30251		78	Average $1729	Windows XP Professional Good 91	This notebook features a single-bay design and comes with a great keyboard. (★★½☆☆ Oct 02)
6	Dell Inspiron 2650 find.pcworld.com/28201		77	Average $1746	Windows XP Home Very good 98	A basic all-in-one notebook with a DVD-ROM/CD-RW combo drive, but only average battery life and price. (★★½☆☆ Aug 02)
7	Amax Elite 6400W find.pcworld.com/30800		76	Expensive $1999	Windows XP Professional Very good 101	Sleek, one-bay notebook comes with a SmartMedia slot and an optical drive conveniently located on the front. (★★★☆☆ Nov 02)
8	Sharp Actius GP20 find.pcworld.com/31844	NEW	74	Expensive $1999	Windows XP Home Outstanding 109	Chunky desktop replacement comes with four USB 1.1 ports and both Secure Digital and SmartMedia card slots. (★★½☆☆)
		Percent of overall rating ▶		20 percent	15 percent	

Go to find.pcworld.com/10860 for details on *PC World*'s Star Ratings.

[1] Performance word scores reflect comparisons of PCs in the same category (power or value) running the same operating system. For more details, see "Your Guide to the Top 100" on page 139.

[2] Except where noted, all Intel CPUs are SpeedStep chips, which run at a slower speed on battery power.

[3] In gigabytes.

TENACIOUS BEST BUYS FEND OFF a handful of newcomers on this month's chart. Sleek one-bay notebooks from IBM and Dell retain their top spots on the power and value portions, respectively, of the chart. Four new notebooks—three of them almost identical to previous chartmakers that used slower chips—claim places on the power list. Among the revamped models, the Gateway 600XL turned in the best performance.

Though good enough to make the chart, the second-place Dell Inspiron 8200 and the number five Toshiba Satellite Pro 6100 were less impressive as follow-ons, turning in about the same speed

PHOTOGRAPH: RICK RIZNER

Visit find.pcworld.com/31922 for reviews of all products tested this month and ranked in this chart.

BASE CONFIGURATION										
CPU ²	Screen (inches)	RAM (MB)	Hard drive ³	Pointing device	Multi-purpose bays	Extra features ⁴	Overall design	Battery life (hours:min) ⁵	Average weight (pounds) ⁶	Vendor's reliability/ service
1.8-GHz Pentium 4-M	14.1	256	40	Touchpad, eraserhead	1	**Very good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, SmartSuite Millennium	Outstanding	Average/ 2:30	Light/ 6.7	Good/Good
2-GHz Pentium 4-M	15	256	40	Touchpad, eraserhead	1	**Good:** 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Works 2002	Outstanding	Average/ 2:23	Heavy/ 9.3	Fair/Fair
2.2-GHz Pentium 4-M	15.7	512	40	Touchpad	2	**Good:** 8X DVD-ROM and 24X/10X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Works 2002	Outstanding	Good/ 3:02	Very heavy/ 9.9	Good/Fair
1.8-GHz Pentium 4-M	15	256	40	Touchpad	1	**Very good:** 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Office XP Small Business Edition 2002	Outstanding	Average/ 2:36	Average/ 8.0	⁷/⁷
2-GHz Pentium 4-M	15	512	60	Eraserhead	1	**Average:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter	Very good	Poor/ 1:53	Average/ 7.8	Good/Fair
2.2-GHz Pentium 4 ⁸	16	512	40	Touchpad	0	**Good:** 8X DVD-ROM and 16X/10X/24X CD-RW combo drive, built-in modem and network adapter, Lotus SmartSuite Millennium	Average	Average/ 2:14	Very heavy/ 11.3	Good/Fair
2.2-GHz Pentium 4-M	15	512	30	Touchpad	0	**Good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter	Average	Average/ 2:23	Average/ 7.8	⁷/⁷
5 percent						10 percent	10 percent	5 percent	10 percent	25 percent

BASE CONFIGURATION										
CPU ²	Screen (inches)	RAM (MB)	Hard drive ³	Pointing device	Multi-purpose bays	Extra features ⁴	Overall design	Battery life (hours:min) ⁵	Average weight (pounds) ⁶	Vendor's reliability/ service
1.8-GHz Pentium 4-M	14.1	256	30	Touchpad, eraserhead	1	**Very good:** 8X DVD-ROM and 20X/10X/24X CD-RW combo drive, built-in modem and network adapter, Works 2002	Outstanding	Average/ 2:57	Average/ 7.2	Fair/Fair
1.8-GHz Pentium 4-M	14.1	256	30	Eraserhead	1	**Good:** 8X DVD-ROM drive, built-in modem and network adapter, Lotus SmartSuite Millennium	Outstanding	Average/ 2:58	Light/ 6.7	Good/Good
2A-GHz Pentium 4 ⁸	15	256	40	Touchpad	0	**Very good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, SmartSuite Millennium	Average	Very good/ 4:11	Very heavy/ 9.8	Good/Fair
2-GHz Pentium 4-M	14	512	40	Touchpad	1	**Very good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter	Average	Average/ 2:29	Average/ 7.7	⁷/⁷
1.8-GHz Pentium 4-M	15	256	20	Touchpad	1	**Average:** 8X DVD-ROM and 16X/10X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Works 2002	Very good	Average/ 2:40	Average/ 7.5	Good/Fair
1.6-GHz Pentium 4-M	14.1	256	30	Touchpad	0	**Good:** 8X DVD-ROM and 8X/8X/24X CD-RW combo drive, built-in modem and network adapter, Microsoft Works 2002	Average	Average/ 2:18	Heavy/ 8.3	Fair/Fair
2-GHz Pentium 4-M	14.1	256	30	Touchpad	1	**Average:** 8X DVD-ROM drive, built-in modem and network adapter, Microsoft Works 2002	Very good	Average/ 2:25	Average/ 7.3	⁷/⁷
2A-GHz Pentium 4 ⁸	15	256	40	Touchpad	0	**Average:** 8X DVD-ROM and 16X/10X/24X CD-RW combo drive, built-in modem and network adapter	Average	Average/ 2:02	Very heavy/ 9.5	⁷/⁷
5 percent						10 percent	10 percent	5 percent	10 percent	25 percent

[4] Word score reflects both listed and unlisted features.
[5] Unless otherwise noted, all notebooks come with a lithium ion battery.
[6] Includes computer, AC adapter, power cord, floppy drive, and optical drive.
[7] Insufficient data to give a rating.
[8] Single-speed desktop CPU.

numbers as the previous incarnations of the Inspiron 8200 and Satellite Pro 6100 on the chart did—but with shorter battery lives. Chem USA's ChemBook 4025, our seventh-place power notebook, is relatively lightweight for an all-in-one.

Two new notebooks made the value list. The $1499 Micro Express NP1020A, in fourth place, has a low price and loads of nice features. Sharp's $1999 Actius GP20 claimed the last spot. It's expensive for a model with only a CD-ROM drive, but it shone in our speed tests, outracing other value notebooks by about 10 percent. ▶

DELL'S Inspiron 8200 delivers strong audio.

COMPUTER SCREEN GRAPHICS: JOHN GODDARD

Built with Intel® Pentium® 4 processor 3.06GHz Hyper-threading technology, all the branded components, along with our prudence...EZ-Link PCs will bring you to

a new world that beyond your imagination.

EZ-link Gamer - Xpert #Z1049

MSI SiS 648 Chipset **8X AGP** & USB 2.0 MainBoard
512MB PC2700 (333MHz) DDR RAM
Seagate® 80GB Ultra ATA/100 7200rpm Hard Drive
1.44MB Floppy Drive
64MB NVIDIA GeForce4 MX440 **(8X AGP)** w/TV Out & DVI
48x12x48 CD-RW Drive & 16X DVD-ROM
Integrated Audio
56K V.92 Fax Modem & 10/100 LAN
Black Mid Tower Case w/
"See Through Windows" & Neon Light
Internet Keyboard & Mouse
Speaker W/subwoofer
Microsoft® Windows® XP Home Edition
3 Year Limited Warranty
(Monitor sold separately)

System w/ Processor

Intel® Pentium® 4 processor 3.06GHz (533FSB)	$1,459
Intel® Pentium® 4 processor 2.80GHz (533FSB)	$1,270
Intel® Pentium® 4 processor 2.53GHz (533FSB)	$1,033
Intel® Pentium® 4 processor 2.40GHz (533FSB)	$ 999
Intel® Pentium® 4 processor 2.26GHz (533FSB)	$ 985
Intel® Pentium® 4 processor 2.0 GHz (400FSB)	$ 950

Options:

Upgrade to Microsoft® Windows® XP Pro or 2000 Pro add	$55.00
Microsoft® Works Suite 2002	$60.00
Microsoft® Office XP Professional	$275.00
Microsoft® Office XP Small Business	$165.00
17" SVGA .27mm Monitor	$120.00
19" SVGA .26mm Monitor	$165.00
15" Fl Panel LCD Display	$298.00
17" Fl Panel LCD Display	$460.00

EZ-link - Enterprise #Z1056

Intel® D845GEBV2L 533MHz FSB MainBoard
512MB PC2700 (333MHz) DDR RAM
Seagate® 80GB Ultra ATA/100 7200rpm Hard Drive
1.44MB Floppy Drive
Integrated Intel Extreme Graphics,
Audio & Intel 10/100 LAN
16X DVD-ROM
48x12x48 CD-RW Drive
US-Robotic 56k V.90 Fax Modem
IN-WIN J508 Mid Tower Case
Internet Keyboard & Optical Mouse
Speaker W/subwoofer
Microsoft® Windows® XP Home Edition
3 Year Limited Warranty
(Monitor sold separately)

System w/ Processor

Intel® Pentium® 4 processor 3.06GHz (533FSB)	$1,353
Intel® Pentium® 4 processor 2.80GHz (533FSB)	$1,163
Intel® Pentium® 4 processor 2.53GHz (533FSB)	$ 927
Intel® Pentium® 4 processor 2.40GHz (533FSB)	$ 884
Intel® Pentium® 4 processor 2.26GHz (533FSB)	$ 879
Intel® Pentium® 4 processor 2.0 GHz (400FSB)	$ 845

EZ-link Corporate PC #Z1057

Microstar (i845) 6526GL MainBoard
256MB PC2100 (266MHZ) DDR RAM
Seagate® 40GB Ultra ATA/100 7200rpm Hard Drive
1.44MB Floppy Drive
52x Max Variable CD-ROM
40x12x48 CD-RW Drive Add $65.00
Integrated Audio, Video & 10/100 LAN
56K V.92 Fax Modem
Black IN-WIN V523 MicroATX Tower Case
Keyboard & Wheel Mouse
Speaker W/subwoofer
Microsoft® Windows® XP Home Edition
3 Year Limited Warranty
(Monitor sold separately)

System w/ Processor

Intel® Pentium® 4 processor 2.40GHz	$ 634
Intel® Pentium® 4 processor 2.20GHz	$ 627
Intel® Pentium® 4 processor 2.0 GHz	$ 596
Intel® Pentium® 4 processor 1.80GHz	$ 576
Intel® Pentium® 4 processor 1.60GHz	$ 547

EZ-link Gamer - Pro #Z1051

Intel® D845PESVL 533MHz FSB MainBoard
512MB PC2700 (333MHz) DDR RAM
Seagate® 80GB Ultra ATA/100 7200rpm Hard Drive
1.44MB Floppy Drive
128MB NVIDIA GeForce4 Ti4200 w/TV OUT
48x12x48 CD-RW Drive & 16X DVD-ROM
Creative Labs SoundBlaster Live 5.1
56k V.92 Fax Modem & Intel 10/100 LAN
Black Mid Tower Case w/
"See Through Windows" & Neon Light
Internet Keyboard & Optical Mouse
Altec Lansing AVS500B 5PCS Surround Sound
Microsoft® Windows® XP Home Edition
3 Year Limited Warranty
(Monitor sold separately)

System w/ Processor

Intel® Pentium® 4 processor 3.06GHz (533FSB)	$1,579
Intel® Pentium® 4 processor 2.80GHz (533FSB)	$1,388
Intel® Pentium® 4 processor 2.53GHz (533FSB)	$1,153
Intel® Pentium® 4 processor 2.40GHz (533FSB)	$1,129
Intel® Pentium® 4 processor 2.26GHz (533FSB)	$1,105
Intel® Pentium® 4 processor 2.0 GHz (400FSB)	$1,070

EZ-link Best Buy #Z1055

Microstar (SiS650) 6524G MainBoard
128MB SDRAM Memory
Seagate® 40GB Ultra ATA/100 Hard Drive
1.44MB Floppy Drive
16X DVD-ROM
Integrated Audio, Video & 10/100 LAN
56K V.92 Fax Modem
IN-WIN V523 MicroATX Tower Case
Keyboard, Wheel Mouse & Speaker
Microsoft® Windows® XP Home Edition
3 Year Limited Warranty
(Monitor sold separately)

System w/ Processor

Intel® Pentium® 4 processor 2.40GHz	$ 598
Intel® Pentium® 4 processor 2.20GHz	$ 573
Intel® Pentium® 4 processor 2.0 GHz	$ 542
Intel® Pentium® 4 processor 1.80GHz	$ 522
Intel® Pentium® 4 processor 1.60GHz	$ 493

www.ztgroup.com 1-866-ZTGROUP

Quality Assured • 3-year Limited warranty • 30 day Money back guarantee • Life Time Technical Support • Special discount for Corporate, School and Government
GET EXACTLY WHAT YOU'RE LOOKING FOR Log on www.ztgroup.com, and use the system configurator to customize your ideal PC.

Purchaser is responsible for all freight costs on all returns of merchandise. Full Credit will not be given for incomplete or damaged returns. Absolutely no refunds for merchandise returned after 30 days. All prices and configurations are subject to change without notice and obligation .Opened software is non-refundable. All returns have to be accompanied with an RMA number and must be in re-sellable condition including all original packaging. System's pictures may include some equipment and/or accessories, which are not standard features. Not responsible for errors in typography and/or photography.
All rights reserved. All brands and product names, trademarks or registered trademarks are property of their respective companies.
* Intel®, Intel® Inside, Celeron®, and Pentium®, are registered trademarks of Intel Corporation and its subsidiaries in the United States and other countries.

TOP 10 MONITORS

Visit find.pcworld.com/32069 for more information on products ranked in this chart.

THE MITSUBISHI DIAMOND PRO 930SB was the best of the new models we tested this month, delivering crisp text and graphics. It comes with well-designed software (which you download from the company's Web site) that lets you make screen adjustments via mouse and keyboard. Compaq's new S9500 replaces the discontinued MV9500 on our chart; though highly affordable, the general-purpose S9500 displays text far better than it does graphics. Similarly, Sony's CPD-E440 does better with text; its graphics score is higher than the Compaq's, but the Sony costs nearly $100 more. ▶

	19-INCH MONITOR	Street price (10/25/02)	Overall rating	Quality of text/ graphics	Comments
1	Best BUY Samsung SyncMaster 957mb find.pcworld.com/30926	$370	92	Outstanding/ Outstanding	**FEATURES:** 17.8-inch viewable area, .24mm[1] shadow mask tube, up to 89-Hz refresh rate,[2] up to 1756 by 1317 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** Great choice for sharp text or brilliant graphics. Navigating this flat-screen monitor's menu controls is intuitive; MagicBright technology enhances images with fixed color-temperature settings. (★★★★☆ Nov 02)
2	Best BUY ViewSonic GS790 find.pcworld.com/10573	$280	91	Very good/ Very good	**FEATURES:** 18-inch viewable area, .26mm[1] shadow mask tube, up to 95-Hz refresh rate,[2] up to 1600 by 1200 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** Vibrant, realistic colors make this model a good choice for graphics pros, and sharp text makes it appropriate for word processing, too. Short case depth would suit cramped spaces. (★★★★☆ Sept 01)
3	Dell M992 find.pcworld.com/30914	$249	90	Very good/ Outstanding	**FEATURES:** 17.8-inch viewable area, .24mm[1] shadow mask tube, up to 85-Hz refresh rate,[2] up to 1600 by 1200 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** This attractively contoured, midnight-gray monitor delivers solid text and graphics on a flat screen. The unit's on-screen menu is sometimes hard to understand, however. (★★★☆☆ Nov 02)
4	IBM P97 find.pcworld.com/18803	$429	88	Very good/ Very good	**FEATURES:** 18-inch viewable area, .24-.25mm[1] FD Trinitron aperture grille tube,[3] up to 85-Hz refresh rate,[2] up to 1600 by 1200 resolution at 70 Hz, TCO '95-compliant, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** Pricey display renders sharp lettering and delicately detailed photos—it's a solid choice for heavy text work or video editing. Black case is handsome. (★★★★☆ Feb 02)
5	NEC MultiSync FP955 find.pcworld.com/27824	$380	86	Very good/ Good	**FEATURES:** 17.9-inch viewable area, .24mm[1] Diamondtron NF aperture grille tube,[3] up to 101-Hz refresh rate,[2] up to 1920 by 1440 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** High-end display delivers stronger text than graphics. For $800 you can purchase it with an optional hardware color-calibrator to tweak color accuracy. Five-port USB 1.1 hub comes standard. (★★★⯪☆ July 02)
6	CTX PR960FL find.pcworld.com/27822	$335	86	Very good/ Very good	**FEATURES:** 18-inch viewable area, .24-.25mm[1] FD Trinitron aperture grille tube,[3] up to 102-Hz refresh rate,[2] up to 1800 by 1440 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** Unit offers crisp text and vibrant colors for a reasonable price. Complies with the widely used MPRII specification but (unlike other monitors here) not with the more stringent TCO standard. (★★★⯪☆ July 02)
7	Sony CPD-G410R find.pcworld.com/23303	$399	85	Very good/ Very good	**FEATURES:** 17.9-inch viewable area, .24-.25mm[1] FD Trinitron aperture grille tube,[3] up to 85-Hz refresh rate,[2] up to 1800 by 1400 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** Monitor has equally good text and graphics. The single control button keeps things simple, but navigating the on-screen menu can be confusing. (★★★⯪☆ May 02)
8	Mitsubishi Diamond Pro 930SB NEW find.pcworld.com/31850	$400	85	Very good/ Very good	**FEATURES:** 17.9-inch viewable area, .24mm[1] aperture grille tube,[3] up to 102-Hz refresh rate,[2] up to 1920 by 1440 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** Flat-screen unit delivers vivid colors and crisp text. Icons on the small, round control buttons are hard to see, but downloadable software for making adjustments via keyboard and mouse is a plus. (★★★★☆)
9	Compaq S9500 NEW find.pcworld.com/31826	$269	84	Very good/ Fair	**FEATURES:** 18.1-inch viewable area, .26mm[1] shadow mask tube, up to 85-Hz refresh rate,[2] up to 1280 by 1024 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** Well-priced model offers handsome case and sharp text. On-screen controls lack word descriptors, but provide handy gauges for precise tuning. Colors look anemic compared with those of other monitors here. (★★★☆☆)
10	Sony CPD-E440 NEW find.pcworld.com/31865	$350	83	Very good/ Good	**FEATURES:** 17.9-inch viewable area, .24-.25mm[1] FD Trinitron aperture grille tube,[3] up to 85-Hz refresh rate,[2] up to 1600 by 1200 resolution at 70 Hz, three-year warranty, 24-hour daily toll-free support. **SUMMARY:** Shapely model has a putty-tone case, and delivers crisp text and realistic colors. High-end controls (for convergence and moiré) are a plus. Sensitive minijoystick simplifies on-screen adjustments. (★★★⯪☆)

HOW WE TEST: Twelve judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays screens of typical letters, spreadsheets, Web pages, and photos. Overall rating is based on text and graphics quality (25 percent each), price (25 percent), features and ease of use (20 percent), and service and support (5 percent). The best possible overall rating is 100. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on *PC World*'s Star Ratings. All monitors are TCO '99 compliant unless otherwise indicated. [1] Represents diagonal dot pitch for shadow mask monitors and stripe or varying stripe pitch for aperture grille monitors. [2] Maximum refresh rate at 1280 by 1024 resolution (as tested on this size monitor). [3] Uses aperture grille in which parallel wires near the sides of the screen are strung farther apart than those in the middle.

TEST Center

TOP 10 CD-RW DRIVES

Visit find.pcworld.com/31898 for more information on all products ranked in this chart.

THE NEW TDK 48X VeloCD tops the chart on the strength of its first-rate performance in writing to both CD-R and CD-RW. A strong combination of fast write times and an attractive $70 price tag earn LG Electronics' GCE-8480B a second-place debut. The GCC-4320B combination drive, another new model from LG that earns tenth place, won't win any performance awards, but it has a bargain price for a relatively quick CD-RW drive that also reads DVD-ROM discs at the faster-than-average speed of 16X. Next month, look for our list of the top internal and external rewritable DVD drives. ▶

	CD-RW DRIVE	Street price (10/29/02)	Overall rating	Performance/ support policies	CD-R write speed for 650MB/ CD-RW write speed for 100MB (min:sec)	Comments
1	Best BUY TDK 48X VeloCD NEW find.pcworld.com/31757	$90	89	Outstanding/ Very good	2:32/0:56	**FEATURES:** 48X/24X/48X,[1] IDE, internal, 2MB buffer,[2] Ahead Nero Express 5.5 and InCD 3.3, one-year warranty, 10.5-hour daily toll-free support. **SUMMARY:** Top scores on our CD-RW burning tests, the fastest time on the chart for our CD-R tests, and a very reasonable price combine to push this new drive to the top. (★★★★☆)
2	Best BUY LG Electronics GCE-8480B NEW find.pcworld.com/31754	$70	87	Very good/ Good	2:48/0:56	**FEATURES:** 48X/16X/48X,[1] IDE, internal, 2MB buffer,[2] Roxio Easy CD Creator 5.3 and DirectCD 5.3, one-year warranty, 13-hour weekday toll-free support. **SUMMARY:** One of the cheapest units on the chart, this model offers above-average performance in writing to both CD-R and CD-RW discs, but no weekend tech support. (★★★½☆)
3	Memorex 48X CD ReWritable Drive find.pcworld.com/31052	$70	81	Very good/ Fair	2:36/1:08	**FEATURES:** 48X/12X/48X,[1] IDE, internal, 2MB buffer,[2] Mt. Rainier support, Ahead Nero Burning ROM 5.5 and InCD 3.27, one-year warranty, 9-hour weekday support (calls are not toll-free). **SUMMARY:** Fine performance and a great price make for a respectable showing on our chart, but tech support is limited to weekdays only. (★★★½☆ Nov 02)
4	Pacific Digital Mach48 CD-RW find.pcworld.com/29906	$85	81	Very good/ Fair	2:36/1:06	**FEATURES:** 48X/12X/48X,[1] IDE, internal, 2MB buffer,[2] Mt. Rainier support, Ahead Nero Burning ROM 5.5 and InCD 3.27, one-year warranty, 12-hour weekday toll-free support. **SUMMARY:** This model's CD-ROM read performance lags behind that of the fastest drives, but it sped through our CD-R writing tests. Price falls $15 this month. (★★★★☆ Sep 02)
5	CenDyne Lightning IV 48x12x48 CD-RW CDI 00118 find.pcworld.com/30524	$80	81	Very good/ Fair	2:37/1:08	**FEATURES:** 48X/12X/48X,[1] IDE, internal, 2MB buffer,[2] Mt. Rainier support, Ahead Nero Burning ROM 5.5 and InCD 3.27, one-year warranty, 12-hour weekday and 4-hour Saturday support (calls are not toll-free). **SUMMARY:** This speedy performer includes a well-illustrated manual with troubleshooting information. (★★★★☆ Oct 02)
6	Asus CRW-4012A find.pcworld.com/29561	$60	80	Good/ Fair	3:27/1:07	**FEATURES:** 40X/12X/48X,[1] IDE, internal, 2MB buffer,[2] Ahead Nero Burning ROM 5.5 and InCD 3.23, one-year warranty, 11.5-hour weekday support (calls are not toll-free). **SUMMARY:** Bargain-priced drive achieved quick times on our CD-RW packet-writing tests. The bezel features play, fast-forward, and stop buttons for audio CDs. (★★★★☆ Aug 02)
7	Sony CRX210A1 find.pcworld.com/31064	$100	80	Very good/ Very good	2:38/1:08	**FEATURES:** 48X/12X/48X,[1] IDE, internal, 2MB buffer,[2] Mt. Rainier support, B's Recorder Gold 3.29 and B's Clip 3.31, one-year warranty, 12-hour weekday and 12-hour Saturday toll-free support. **SUMMARY:** Speedy drive comes with weak documentation, but it achieved the fastest digital audio extraction in our tests. (★★★½☆ Nov 02)
8	Plextor PlexWriter 48/24/48A find.pcworld.com/31061	$120	80	Very good/ Fair	2:42/0:59	**FEATURES:** 48X/24X/48X,[1] IDE, internal, 4MB buffer,[2] Mt. Rainier support, Roxio Easy CD Creator 5.3, DirectCD 5.3, and Oak SimpliCD, one-year warranty, 11-hour weekday toll-free support. **SUMMARY:** This model got better-than-average scores in our tests. Plextor is the only vendor to bundle two CD mastering applications. (★★★★☆ Nov 02)
9	Samsung SW-240 find.pcworld.com/30539	$70	80	Good/ Good	3:32/1:14	**FEATURES:** 40X/12X/40X,[1] IDE, internal, 8MB buffer,[2] Roxio Easy CD Creator 5.1 and DirectCD 5.1, one-year warranty, 12-hour weekday toll-free support. **SUMMARY:** A generous 8MB buffer theoretically helps minimize use of the buffer underrun protection, but the drive was a lackluster performer in our tests. (★★★½☆ Oct 02)
10	LG Electronics GCC-4320B NEW find.pcworld.com/31763	$95	79	Fair/ Good	3:46/1:29	**FEATURES:** 32X/10X/40X/16X,[1] IDE, internal, 2MB buffer,[2] Roxio Easy CD Creator 5.1 and DirectCD 5.1, one-year warranty, 13-hour weekday toll-free support. **SUMMARY:** Combination drive had average results for its rated CD read/write speeds, but it can also read DVD-ROM discs at a relatively quick speed of 16X. (★★★½☆)

HOW WE TEST: To determine CD-R write performance, we burn data to CD-R discs from an image file and on the fly. We measure CD-RW performance by copying 100MB of files to a CD-RW disc, and then rewriting the same data to the same disc. To gauge CD-ROM read performance, we time how long the drive takes to install Microsoft Office 2000 SBE (disc one); we also evaluate the drive's digital audio extraction speed by extracting 320MB of musical tracks from an audio CD to our hard drive. Overall ratings are based on performance (35 percent), price (25 percent), features (20 percent), tech support policies (10 percent), and ease of installation (10 percent). See find.pcworld.com/10860 for details on *PC World*'s Star Ratings. [1] Vendor's speed ratings, listed in order: CD-R write/CD-RW write/CD-ROM read/DVD-ROM read (if applicable). [2] Unless otherwise noted, all drives use buffer underrun protection.

TOP 10 GRAPHICS BOARDS

Visit find.pcworld.com/31961 for more information on products ranked in this chart.

CARDS FEATURING THE ATI Radeon 9700 chip blast onto the power chart. ATI's own Radeon 9700 Pro board takes fourth place, while a model from graphics newcomer Crucial Technology wins the second spot thanks to a better bundle of extras. Neither board is cheap, however, so the Best Buy goes to the $260 GeForce4 Ti 4600–based Leadtek WinFast A250 Ultra TD-MyVIVO. Falling prices shift items on our value list, which welcomes the Asus AGP-V8170DDR board. ▶

	POWER GRAPHICS BOARD	Street price (10/25/02)	Overall rating	Overall speed	Features rating	Comments
1	Best BUY Leadtek WinFast A250 Ultra TD-MyVIVO find.pcworld.com/31796 NEW	$260	92	Very good	Outstanding	**FEATURES:** NVidia GeForce4 Ti 4600 chip, 128MB of DDR SDRAM, 350-MHz RAMDAC; DVI-out, S-Video-in and -out, dual-display support; Ulead VideoStudio 6; Aquanox, Master Rallye, Rogue Spear: Black Thorn games. **SUMMARY:** One of the fastest cards we've tested, this model has a generous software bundle. (★★★★☆)
2	Crucial Technology Radeon 9700 Pro find.pcworld.com/31787 NEW	$352	92	Outstanding	Very good	**FEATURES:** ATI Radeon 9700 chip, 128MB of DDR SDRAM, 400-MHz RAMDAC; DVI-out, S-Video-out, dual display support; CyberLink PowerDVD XP. **SUMMARY:** Our first card from Crucial turns in excellent frame rates, especially at higher resolutions, and handles antialiasing well. (★★★★½)
3	MSI G4Ti4400-VTD find.pcworld.com/30446	$240	89	Very good	Very good	**FEATURES:** NVidia GeForce4 Ti 4400 chip, 128MB of DDR SDRAM, 350-MHz RAMDAC; DVI-out, S-Video-in and -out, dual-display support; MSI DVD player, InterVideo WinProducer/WinCoder; Aquanox, No One Lives Forever, Sacrifice games. **SUMMARY:** Produced solid numbers in our benchmarking tests. (★★★★½ Oct 02)
4	ATI Radeon 9700 Pro find.pcworld.com/31808 NEW	$360	86	Outstanding	Good	**FEATURES:** ATI Radeon 9700 chip, 128MB of DDR SDRAM, 400-MHz RAMDAC; DVI-out, S-Video-out, dual-display support; ATI DVD player. **SUMMARY:** Churns out top-tier frame rates at high resolutions and maintains impressive rates with antialiasing enabled. Bundle includes few extras. (★★★★½)
5	Gainward GeForce4 PowerPack Ultra/650 XP Golden Sample find.pcworld.com/30143	$165	86	Very good	Good	**FEATURES:** NVidia GeForce4 Ti 4200 chip, 128MB of DDR SDRAM, 350-MHz RAMDAC; DVI-out, S-Video-in and -out; InterVideo WinDVD, WinProducer/WinCoder; Serious Sam First Encounter game. **SUMMARY:** The least-expensive power card here offers satisfying performance for the money. (★★★★☆ Oct 02)

	VALUE GRAPHICS BOARD	Street price (10/25/02)	Overall rating	Overall speed	Features rating	Comments
1	Best BUY MSI G4MX440-VTP find.pcworld.com/28562	$80	92	Good	Average	**FEATURES:** NVidia GeForce4 MX 440 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-out; No One Lives Forever, Sacrifice games. **SUMMARY:** Slightly faster than boards based on the GeForce4 MX 420. Jumps to the number one spot thanks to a $25 price drop. (★★★★☆ Oct 02)
2	MSI G4MX460-VTP find.pcworld.com/30638	$110	91	Good	Very good	**FEATURES:** NVidia GeForce4 MX 460 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-in and -out, dual-display support; MSI DVD player, InterVideo WinProducer/WinCoder; Aquanox, No One Lives Forever, Sacrifice games. **SUMMARY:** Offers above-average features and relatively good performance. (★★★★☆ Oct 02)
3	Gainward GeForce4 PowerPack Pro/600 TV Golden Sample find.pcworld.com/28581	$81	91	Good	Average	**FEATURES:** NVidia GeForce4 MX 440 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-out; InterVideo WinDVD software player. **SUMMARY:** This card closely matches our Best Buy model in both price and performance, but it doesn't include any games or other extras. (★★★★☆ Oct 02)
4	Asus AGP-V8170DDR find.pcworld.com/31790 NEW	$90	90	Good	Good	**FEATURES:** NVidia GeForce4 MX 440 chip, 64MB of DDR SDRAM, 350-MHz RAMDAC; S-Video-out; Asus DVD 2000 player; Aquanox, Midnight GT/Rage Rally games. **SUMMARY:** This month's newcomer is a basic card that offers good performance, a few games, and documentation that's better than average. (★★★½☆)
5	ATI Radeon 9000 Pro find.pcworld.com/30458	$129	89	Good	Very good	**FEATURES:** ATI Radeon 9000 Pro chip, 64MB of DDR SDRAM, 400-MHz RAMDAC; DVI-out, S-Video-out port, dual-display support. **SUMMARY:** In most of our game tests, the Radeon 9000 Pro trounced cards based on NVidia GeForce4 MX 420, 440, and 460 chips. (★★★★½ Oct 02)

HOW WE TEST: Visit find.pcworld.com/31961 for our test methodology; see find.pcworld.com/10850 for details on *PC World*'s star ratings.

TEST Center

TOP 10 DIGITAL CAMERAS

Visit find.pcworld.com/32021 for reviews of all products tested this month and ranked in this chart.

THE MORE THE MEGAPIXELS: Almost every camera on this month's $500-and-over chart offers 4-megapixel-class resolution or better—even the models dancing on our $500 price floor. Nikon earned three of the ten spots; the new Coolpix 4300 enters at the top mostly because of its superb image quality. Sony's Cyber-shot DSC-F717 ably succeeds one of our favorite cameras, the DSC-F707; its long zoom lens and low-light features make it very flexible. Hewlett-Packard makes a rare appearance on our chart of high-end cameras with the Photosmart 850; it has an even longer (8X) lens. ▶

	CAMERA: $500 AND OVER	Street price (11/1/02)	Overall rating	Image quality	Ease of use	Battery life/ shots	Comments [1]
1	Best BUY Nikon Coolpix 4300 NEW find.pcworld.com/32000	$500	86	Outstanding	Fair	Good/ 277	**FEATURES:** 4-megapixel resolution, 16MB CompactFlash media, 38mm-114mm focal range; USB and video output; 10.1 ounces. **SUMMARY:** Lightweight camera takes wonderful shots and is easy to hold with one hand, but its multilayered menus make using its advanced features a tad difficult. (★★★★☆)
2	Best BUY Canon PowerShot G2 find.pcworld.com/14800	$650	84	Outstanding	Good	Good/ 373	**FEATURES:** 4-megapixel resolution, 32MB CompactFlash media, 34mm-102mm focal range; USB and video output; 18.9 ounces. **SUMMARY:** Offering sharp, vivid photographs and tons of exposure-control settings, the G2 is a great option for photo hobbyists. Soon to be replaced by the PowerShot G3. (★★★★☆ Nov 02)
3	Fujifilm FinePix S602 Zoom find.pcworld.com/30470	$700	81	Good	Very good	Very good/ 425	**FEATURES:** 3.1-megapixel resolution, 16MB SmartMedia card, 35mm-210mm focal range; USB and video output; 20.4 ounces. **SUMMARY:** The S602 has a hot-shoe flash sync and both SmartMedia and CompactFlash media slots, but it is expensive for a 3-megapixel camera. (★★★★☆ Nov 02)
4	Sony Cyber-shot DSC-F717 NEW find.pcworld.com/31526	$1000	81	Very good	Good	Very good/ 491	**FEATURES:** 5-megapixel resolution, 32MB Memory Stick media, 38mm-190mm focal range; USB and video output; 23.8 ounces. **SUMMARY:** An upgrade to the DSC-F707, this model provides user-selectable zone autofocus and USB 2.0 support for faster downloads. Takes great shots, too. (★★★★☆)
5	Nikon Coolpix 4500 find.pcworld.com/30845	$700	80	Good	Good	Good/ 300	**FEATURES:** 4-megapixel resolution, 16MB CompactFlash media, 38mm-155mm focal range; USB and video output; 13.6 ounces. **SUMMARY:** Nice range of features includes 16 scene modes and various optional lens adapters. The lens rotates independently of the camera body for self-portraits. (★★★☆☆ Nov 02)
6	HP Photosmart 850 NEW find.pcworld.com/31994	$500	79	Very good	Good	Fair/ 185	**FEATURES:** 3.94-megapixel resolution, 16MB Secure Digital media, 37mm-300mm focal range; USB and video output; 17.8 ounces. **SUMMARY:** Big, clunky camera has a gorgeous LCD and an extralong (8X) zoom lens, but the zoom is noisy and inaccurate. Lacks rechargeable batteries and a charger. (★★★☆☆)
7	Casio QV-R4 NEW find.pcworld.com/31997	$500	78	Very good	Good	Good/ 372	**FEATURES:** 4-megapixel resolution, 11MB internal memory, Secure Digital media slot, 38mm-113mm focal range; USB output; 7.8 ounces. **SUMMARY:** Inexpensive for a 4-megapixel camera, the QV-R4 lets you set exposure by selecting from sample scenes that approximate the results of different settings. (★★★½☆)
8	Nikon Coolpix 5700 NEW find.pcworld.com/31118	$1200	76	Very good	Fair	Good/ 336	**FEATURES:** 5-megapixel resolution, 16MB CompactFlash media, 35mm-280mm focal range; USB and video output; 19 ounces. **SUMMARY:** Like the Coolpix 5000, the Coolpix 5700 is complex and powerful, and takes impressive pictures. The 5700's 8X zoom makes it better for sports or wildlife photography. (★★★★☆)
9	Leica Digilux 1 find.pcworld.com/30467	$870	73	Fair	Good	Good/ 360	**FEATURES:** 3.9-megapixel resolution, 64MB Secure Digital media, 33mm-100mm focal range; USB and video output; 16.1 ounces. **SUMMARY:** The big, boxy, and heavy Digilux 1 has a retro design, a huge 2.5-inch LCD screen, and a fast multiburst mode, but our test photos looked too dark. (★★☆☆☆ Nov 02)
10	Sony Cyber-shot DSC-P9 find.pcworld.com/28122	$600	73	Fair	Outstanding	Fair/ 206	**FEATURES:** 4-megapixel resolution, 16MB Memory Stick media, 39mm-117mm focal range; USB and video output; 7.2 ounces. **SUMMARY:** Small, lightweight, and fun to use, with extra features (like image editing in the camera). Photo quality is unimpressive, however, and battery life is short. (★★★☆☆ Nov 02)

HOW WE TEST: Each camera's overall rating is based on price (15 percent), picture quality (30 percent), ease of use (15 percent), features (20 percent), battery life (10 percent), and support (10 percent). For all ratings, higher is better. To gauge picture quality, we take a series of shots, with and without flash, at 640 by 480 resolution and at the camera's highest resolution. We photograph a complex still life and a mannequin to see how well each camera captures details and subtle colorings such as skin tones. A panel of judges reviews the on-screen and printed photos and assigns image-quality scores; we then average those scores. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. See find.pcworld.com/10860 for details on *PC World's* Star Ratings. [1] Resolutions are expressed in effective pixels, focal range is identified as 35mm equivalent, and camera weights include batteries.

MORE REVIEWS

MISSED AN ISSUE OF *PC World* or passed your copy along to a friend? Here's a recap of other *Top 100* topics from previous issues. To read reviews of the products ranked on these *Top 10* charts, go online and type in the *PC World* Find-It URL at the top of each chart (for example, go to find.pcworld.com/31544 for products on the *Top 10 Color Laser Printers* chart). Next month we'll look at monochrome laser printers, PDAs, recordable DVD drives, and digital cameras under $500. ■

TOSHIBA'S E-Studio 6CP delivers clear detail and attractive shading on both color and gray-scale graphics.

THOUGH IT'S TINY and can even fit in your pocket, the 4-megapixel Pentax Optio 430RS—the number eight camera on our under-$500 chart—takes good pictures.

	COLOR LASER PRINTERS find.pcworld.com/31544
1	Best Buy **Oki Data Oki C7200n** find.pcworld.com/14942
2	Best Buy **Lexmark C720n** find.pcworld.com/14941
3	**Brother HL-4000CN** find.pcworld.com/29201
4	**Toshiba E-Studio 6CP** find.pcworld.com/31541
5	**Minolta-QMS Magicolor 3100 DN** find.pcworld.com/29202
6	**Xerox Phaser 6200** find.pcworld.com/29203
7	**HP Color LaserJet 4600n** find.pcworld.com/31538
8	**Minolta-QMS Magicolor 2200 DeskLaser** find.pcworld.com/21661
9	**Brother HL-2600CN** find.pcworld.com/20542
10	**Oki Data Oki C9200n** find.pcworld.com/14947

From the December 2002 Issue

	17-INCH LCD MONITORS find.pcworld.com/31568
1	Best Buy **Samsung SyncMaster 172T** find.pcworld.com/31385
2	Best Buy **ViewSonic VG171** find.pcworld.com/19942
3	**ViewSonic VG700** find.pcworld.com/31388
4	**Planar PV174** find.pcworld.com/19948
5	**Dell 1702FP** find.pcworld.com/19922
6	**Hyundai ImageQuest L70A** find.pcworld.com/31397
7	**Samsung SyncMaster 171MP** find.pcworld.com/19947
8	**BenQ FP751** find.pcworld.com/19941
9	**CTX PV720A** find.pcworld.com/19952
10	**BenQ FP781** find.pcworld.com/31391

From the December 2002 Issue

		SCANNERS find.pcworld.com/31646
SMALL-OFFICE	1	Best Buy **Epson Perfection 1660 Photo** find.pcworld.com/31166
	2	**Visioneer OneTouch 9000 USB** find.pcworld.com/29882
	3	**HP Scanjet 5500c** find.pcworld.com/31163
	4	**Microtek ScanMaker 4900** find.pcworld.com/29124
	5	**Canon CanoScan Lide 30** find.pcworld.com/29883
	6	**Microtek ScanMaker 6700** find.pcworld.com/29123
	7	**HP Scanjet 3570c** find.pcworld.com/31169
CORPORATE	1	Best Buy **Epson Perfection 2450 Photo** find.pcworld.com/16181
	2	**HP Scanjet 5490c** find.pcworld.com/29121
	3	**Microtek ScanMaker 8700 Pro Design** find.pcworld.com/15843

From the December 2002 Issue

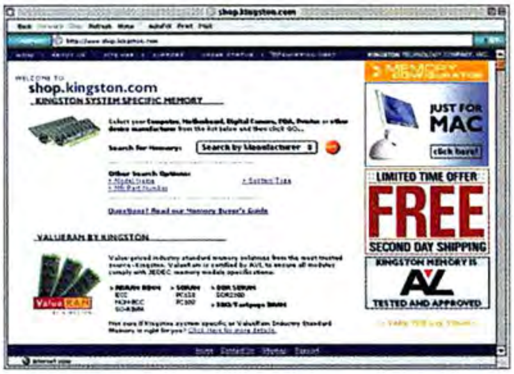
	DIGITAL CAMERAS UNDER $500 find.pcworld.com/31547
1	Best Buy **Olympus C-4000 Zoom** find.pcworld.com/30476
2	Best Buy **Fujifilm FinePix 2800 Zoom** find.pcworld.com/30473
3	**Nikon Coolpix 2000** find.pcworld.com/30479
4	**Olympus D-550 Zoom** find.pcworld.com/30839
5	**HP Photosmart 720** find.pcworld.com/30494
6	**Olympus C-720 Ultra Zoom** find.pcworld.com/30899
7	**Canon PowerShot A200** find.pcworld.com/30488
8	**Pentax Optio 430RS** find.pcworld.com/31532
9	**Kodak EasyShare LS420** find.pcworld.com/30491
10	**Toshiba PDR-3310** find.pcworld.com/30851

From the December 2002 Issue

PHOTOGRAPHS: MARC SIMON

KINGSTON TECHNOLOGY:

MEMORY UPGRADE RAMIFICATIONS


shop.kingston.com
Back Forward Stop Refresh Home AutoFill Print Mail
WELCOME TO
shop.kingston.com
KINGSTON SYSTEM SPECIFIC MEMORY
Search by Manufacturer
Questions? Read our Memory Buyer's Guide
VALUERAM BY KINGSTON
ValueRAM
MEMORY CONFIGURATOR
JUST FOR MAC
click here!
LIMITED TIME OFFER
FREE
SECOND DAY SHIPPING
KINGSTON MEMORY IS
AVL
TESTED AND APPROVED

www.shop.kingston.com

INCREASING RAM GIVES YOU THE BEST BANG FOR YOUR UPGRADE BUCK.

"Think of it this way," said my Introduction to Computers professor (whose name is lost to antiquity): "The CPU controls how big a bite your computer takes of a data sandwich, and the RAM determines how fast it can chew it."

That was true 15 years ago, and it's still true today. With the right amount of tailored RAM installed, your system will chew its way through the streams of text, music, video, and graphic data as fast as the CPU can deliver it. Use too little or the wrong kind of RAM, and your system bogs down with digital indigestion. Fortunately, finding RAM modules that are perfectly tailored to your system requires no more effort than a quick visit to Kingston's Web site (www.shop.kingston.com). There you'll find the configuration tools that will ensure you have the optimum amount of RAM to achieve the best combination of performance, affordability, and reliability.

MEMORY ALPHABET SOUP

Kingston's memory line is encyclopedic. It includes SIMMs, DIMMs, Rambus, DDR, CompactFlash, PC Card, MultiMedia, SmartMedia, and SecureDigital. Confused by this alphabet soup of acronyms and brands? You're not alone, and help's available. The intuitive tools on Kingston's redesigned Web site enable you to select the correct amount and type of RAM that is specifically designed and tested to assure it will work with popular motherboards as well as digital cameras, PDAs, printers, and any other devices whose performance you want to juice up.

Kingston's configurator, prominently located on the site's home page, enables you to select your hardware from hundreds of products in just two clicks. First, you select your hardware's manufacturer. Next, you pick the specific model. In an instant you'll see the available upgrade modules, as well as simple installation illustrations to further assist you in selecting the correct component. You can further refine your search by memory type, manufacturer model or, if you know it, the part number. If you're still stuck, click on "Live Sales Support," and a Kingston rep will promptly contact you. Sound simple? It is.

MEMORY IS MADE OF THIS

At a minimum, purchasing the proper memory for your system means that when you slip the module into an open slot and hit the ON button, your machine will boot. But there's more to getting the best value for your money. Assuring that Kingston's RAM modules deliver all of the reliability and longevity that you expect is the job of Advanced Validation Labs (AVL). This research group exhaustively analyzes every Kingston memory module before it's released for sale.

AVL certifies that every module Kingston designs meets or exceeds the highest standards for temperature tolerance, impedance, propagation, delay, cross-talk, and attenuation. So, in addition to getting premium RAM components, a lifetime warranty, and 24 x 7 free technical support, when you buy Kingston's products you get the assurance that every module comes with the AVL seal.

>> shop.kingston.com

FREE
2nd Day Shipping

COMMITTED TO MEMORY Compatible | Reliable | Lifetime Warranty*

Easy, Fast, Secure…

No crowds. No waiting. Just quality memory direct from the manufacturer. Kingston has been providing memory solutions for over 15 years. At shop.kingston.com we've made buying memory so easy all you need to know is the model name of your computer or digital device. Shop.kingston.com is also a Verisign Secure Site, which makes shopping with us as secure as it is easy.

VeriSign Secure Site

BizRate.com customer certified

www.shop.kingston.com

Kingston TECHNOLOGY

ISO 9001

© 2002 Kingston Technology Company, Inc. 17600 Newhope Street, Fountain Valley, CA 92708 USA (714) 435-2600 Fax (714) 435-2699
All rights reserved. All trademarks and registered trademarks are the property of their respective owners. * Lifetime warranty applies to memory modules only.

Calculator
Sub Total
Tax1
Tax2
Grand To
Present this coupon on

PC AMERICA: INVENTORY MANAGEMENT AT POINT OF SALE

www.pcamerica.com

PC AMERICA
What's New
Products
Free Updates
Free Demos
Support
Contact Us
Go Shopping
Home
Search for:
Go
PC AMERICA
1-800-722-6374
Cash Register Express 2000 (CRE 2000)
Point of Sale
Get FREE Demo NOW!
5 Star Palm Software
148726
Software Info
Download Now
Hardware Info
List of Dealers in Your Area
Secure On-Line Store
Click Here for CRE 2000 Features

The home page for PC America speeds you to the point-of-sale products you need.

While many motorists in Dimondale, Mich. say the family-owned Windmill Truck Stop is a home away from home, its controller, Kevin Edelmann, says it's been more like a house of accounting horrors. Besides monitoring retail fuel sales in the truck stop's "truckers only" area, he also has to keep an eye on commuters' and travelers' purchases in the king-sized complex's convenience store, family restaurant, motel, and auto service center. "Keeping track of all of that inventory has been a nightmare," Edelmann says.

The Point of Sale (POS) system that the Windmill had been using since 1982 did a fine job of ringing up sales, but it couldn't tell store managers anything about what was on the shelf. "The system only broke sales down by department," Edelmann says. "So it couldn't tell the difference between a tube of toothpaste and a bottle of shampoo."

Edelmann found only a few POS solutions that were easy to use, Microsoft Windows-based, and able to support multiple input devices. And none of them could manage the 20,000-plus items in the Windmill's convenience store and restaurant. "We desperately needed a solution that could bring all of these components of our business together," he says.

PC AMERICA

Things finally turned around at the Windmill once Edelmann deployed PC America's Cash Register Express (CRE 2000), a Windows-based POS program that works with ordinary PCs and peripherals, as well as barcode scanners, receipt printers, and pole displays (which show charges at the checkout counter). Now all of the Windmill's cashiers can use touch screens and barcode scanners to enter orders and update inventory. And setting up CRE 2000 could not be easier, says Edelmann. "PC America did an excellent job pulling all of the hardware together initially. But the great thing about their software is that I can grab any component I want off the shelf and throw it together in no time. This is one slick program."

The Windmill has processed more than half a million transactions with CRE 2000 and PC America's Restaurant Pro Express (RPE 2000) since October 1999. And Edelmann predicts that PC America will continue to develop the software he needs to keep things running smoothly. "PC America is constantly improving upon their products," he says.

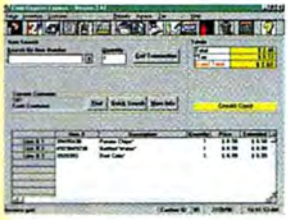
Now PC America is helping retailers like the Windmill to move beyond the sale itself to increase revenues. A new feature in CRE 2000 gives businesses the ability to print coupons on the bottom of sales receipts on an Epson TM-T88II receipt printer. They can use the coupons to advertise specials on slow business days (e.g., "10 Percent Off All Purchases Every Tuesday"), or to give their customers discounts on overstock items (e.g., "Get a Free Six-Pack of Pepsi on Your Next Visit").

CRE 2000's couponing feature promises retailers an excellent route to a crucial dimension in retail sales. "Repeat business is the most important aspect of any business," says PC America's president, Howard Gosman. "With this addition to our POS package, we are giving our customers a quick and easy-to-use method for creating it."

Cash Register Express Software

for Windows...$495

Computerize any type of retail store using Cash Register Express for Windows. Computerization pays for itself, saving you thousands of dollars, giving you peace of mind, and making the best use of your time. Cash Register Express



has more than 250 of the most desired point of sale features to help you leapfrog past your competition by controlling costs, reducing errors and increasing efficiency.

More Software for Your Retail Store

- **Video Express**
- **Salon Express**
- **Auto Express**
- **RestaurantPro Express**
- **Barcode Express**
- **Label Works**
- **Inventory Track Express**
- **Credit Card Software**
- **All Single or Multiuser**

All PC America Software requires Microsoft Windows. The software was written in Visual Basic using Microsoft Access Files. The source code is available.

CASH REGISTER EXPRESS™

More Profit!

More Sales!

More Customers!

Save Time, Reduce Theft, Speed Checkout, Increase Accuracy, Reduce Costs, Make Better Business Decisions by computerizing your Retail Store.

SYSTEMS START AT $495.

Barcode Scanners ~~$495*~~
Metrologic, Symbol, NJCR, Percon, PSC

Receipt Printers ~~$299*~~
Star, Ithaca, Citizen, Epson

Barcode Printers ~~$799*~~
Cognitive Solutions Barcode Blaster

Dealers Wanted!

Join our dealer program. It's **FREE**. It's the fastest way to make money...**AND** we make it **EASY**.

MORE INFO?

- **Call Toll Free 1-800-722-6374**
- **www.pcamerica.com**
- **Fax on Demand** *1-845-267-3551*

Cash Drawers ~~$189*~~
MMF, Logic Controls, Indiana, APG

Programmable Keypads ~~$495*~~
Logic Controls, Cherry, Genovation

Credit Card Readers ~~$189*~~
Unitech, Mag-Tek

*All prices depend on make and model.

Pole Displays ~~$289*~~
Logic Controls

1-800-PC-AMERICA

Call Toll Free 1-800-722-6374
PH: *1-845-267-3500*
FX: *1-845-267-3550*

PC America
60 N. Harrison Ave.
Congers, NY 10920

Portable Data Collectors ~~$695*~~
American Microsystems AMS3000

HERE'S HOW

EDITED BY MICHAEL S. LASKY AND DENNIS O'REILLY

ILLUSTRATION: RICHARD DOWNS

WINDOWS TIPS

SCOTT DUNN

Give Your Drab Desktop a New Look via Themes

ALL Versions ONE OF THE BEST things about Windows is the way it lets you customize its look and feel to suit your style: You can overhaul sounds, pointers, screen savers, icons, and colors at your slightest whim. To save you the work of changing each of these elements individually, Windows provides desktop themes.

Several preconfigured styles are included with Windows. You can apply any of these with a single click via the Display Properties dialog box (right-click the desktop and choose *Properties*), or you can combine various settings into a single file and apply a theme of your own design to the entire group in one fell swoop. Follow these steps to simplify your desktop makeover and overcome hurdles to creating and managing your custom themes.

Thematic tools: A few older versions of Windows come with their own application (themes.exe) for creating, applying, and rotating desktop themes. But don't even bother to check whether you have this utility. Instead, head straight to find.pcworld.com/31298 to download the freeware application Desktop Architect.

This one-stop utility works in most versions of Windows, and though it wasn't designed for XP, you can use it with that OS if you don't mind having the same visual style (such as Windows Classic style or a taskbar that's always blue, olive green, or silver) in every theme. Desktop Architect can't save or change these elements automatically, but you can alter them manually within Windows. Right-click the desktop and choose *Properties* to open the Display Properties dialog box; then click the *Appearance* tab, and choose items from the 'Windows and buttons' and 'Color scheme' drop-down lists.

You can also get a theme changer designed for XP, such as the $20 Style XP from TGT Soft. Go to find.pcworld.com/31301 to download a trial version.

Express yourself: Creating a theme is as simple as setting up your system the way you want it and then saving the setup to a .theme file. In Desktop Architect, the easiest way to do this is to customize your system using that program's Desktop, Appearance, Sounds, Icons, and Pointers tabs. (In some versions of Windows, you can customize other screen elements through Desktop Architect's Logos and Web tabs.) Click the *Apply* button on the toolbar at any time to view the effect.

When you have a look you like, choose *File•Save As*, give the theme a name, and save the file in the folder that stores your themes. To apply a particular theme, select it from the drop-down list on the toolbar and click *Apply* (see **FIGURE 1**).

To create a theme that saves all of the sounds and screen elements in your pre-

INSIDE

156 WINDOWS TIPS Brighten up your desktop with a new Windows theme—whether predesigned or a version you custom-create.

160 INTERNET TIPS Keep your browsing secret by clearing your cookies and history; Internet radio streams again with PeerCast.

162 STEP-BY-STEP Get maximum protection from your antivirus software by ensuring that the essential parameters are properly set.

164 HARDWARE TIPS Windows' System Monitor reports on your PC's performance; screen savers can shorten your monitor's life.

166 ANSWER LINE Two ways to keep files synchronized between two PCs; schedule tasks without using passwords in Windows XP; download Windows updates to disk; a low-cost, easy-to-use macro recorder.

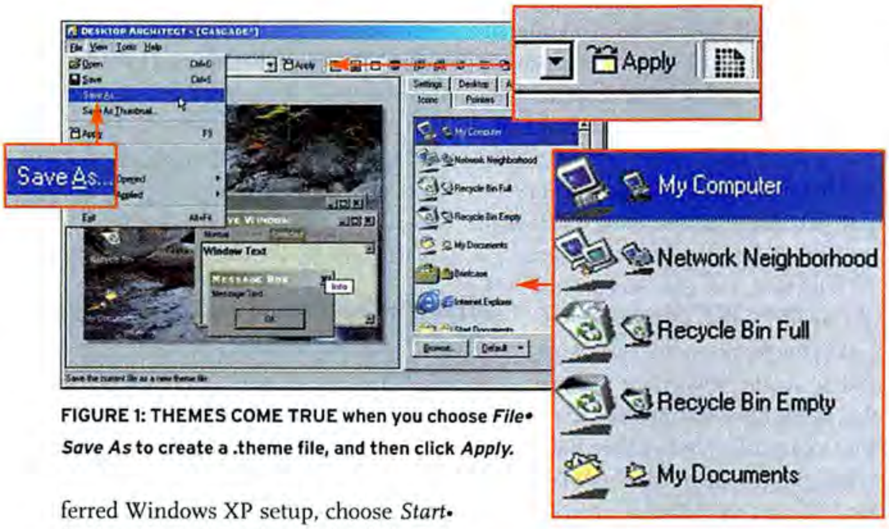


FIGURE 1: THEMES COME TRUE when you choose *File• Save As* to create a .theme file, and then click *Apply*.

ferred Windows XP setup, choose *Start• Settings•Control Panel*, or right-click *Control Panel* and choose *Open*. If you're using Control Panel's Category view and you want to avoid digging through its groupings of applets, simply click *Switch to Classic View* in the upper-left corner.

Now use the various Control Panel applets to customize the look and sound of your system. For sound effects, double-click *Sounds and Audio Devices* and choose the *Sounds* tab. Select an item from the list under 'Program events', and choose a sound from the drop-down list under Sounds; or click *Browse* and select any .wav file on your system. To change your pointer, double-click *Mouse*, choose the *Pointers* tab, and select a pointer from the list under Customize; or click *Browse* and choose any .ani or .cur file.

For most other settings, double-click *Display* to open the Display Properties dialog box. To get different icons, click the *Desktop* tab and then the *Customize Desktop* button. From the icons shown under the General tab, select the one you want to change, click *Change Icon*, and choose one from the window that opens; or click *Browse* and select any .ico file. If you want new desktop wallpaper, click the *Desktop* tab and select an item from the list under Background, or click *Browse* and choose an image file. If you'd like the image to fill the screen, choose *Stretch* from the drop-down list under Position.

To change the color of various Windows components, click the *Appearance* tab and then the *Advanced* button; choose an item from the drop-down list. Next, select a color from the drop-down list under Color, or click *Other* to view a wider range of available hues. You can mix your own shade by experimenting with the spectrum on the right or by entering values between 0 and 255 for Red, Green, and Blue and/or for Hue, Saturation, and Luminance.

Finally, click the *Screen Saver* tab and choose an item from the drop-down list. When Windows looks and sounds the way you want it to, click the *Themes* tab. Choose *Save As*, navigate to the folder holding your themes (the default is the Windows\Resources\Themes folder), and name and save the file. When you want to change themes, return to this tab in Display Properties, choose a different theme from the drop-down list, and click *OK* or *Apply*.

Fix funky menus (XP only): If you create a desktop theme that uses Windows XP's new Luna visual style (with its distinctive blue, olive-green, or silver taskbar) or a downloadable visual style (via Style XP), you may notice that—unless an application is designed to work with XP's new look—the words on a window's menu bar will have the same background color as the menu itself. This is fine if the menu bar color and the menu color go together well. Unfortunately, Display Properties' Advanced Appearance dialog box doesn't provide a way to set the color of the menu bar, so your preferred color scheme may clash with your chosen visual style, making the menu bar of older apps difficult to read. The problem isn't apparent when you first create the theme, but it crops up the next time you apply it (see **FIGURE 2**).

Luckily, though, you can adjust these colors by editing the .theme file. First, open Notepad or your preferred text ▶

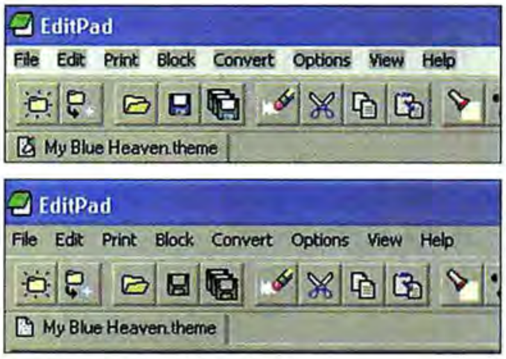
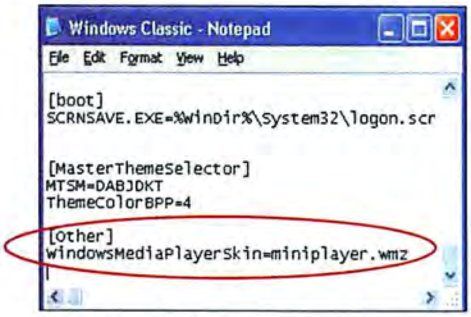

EditPad
File Edit Print Block Convert Options View Help
My Blue Heaven.theme
EditPad
File Edit Print Block Convert Options View Help
My Blue Heaven.theme

FIGURE 2: FIX MISMATCHED COLORS on menus and menu bars in XP by editing the .theme file.



```
[boot]
SCRNSAVE.EXE=%WinDir%\System32\logon.scr


[MasterThemeSelector]
MTSM=DABJDKT
ThemeColorBPP=4

[Other]
WindowsMediaPlayerSkin=miniplayer.wmz
```

FIGURE 3: ADD THE NAME OF a skin to the .theme file to make it part of your theme.

editor. Select *File•Open* and navigate to the folder where you store your .theme files. In the 'File name' box, type ***.theme** and press **<Enter>** so you can see your theme files in the dialog list. Select the theme with the funky menus and click *Open*. Scroll down until you see the heading [Control Panel\Colors]. Find the line that begins Menu= and select the three sets of numbers at the end. (These numbers represent the red, green, and blue values that make up your menu color.) For example, if the line reads 'Menu=163 157 143', you should drag the text cursor over *163 157 143* to select them. Choose *Edit•Copy.*

Now scroll down a bit farther until you find a line that begins MenuBar=. Delete the three numbers at the end of this line. Then, with the text cursor still at the end of the line, choose *Edit•Paste* to add the menu colors to the MenuBar= line. As a result, to continue the previous example, the line might now read 'MenuBar=163 157 143'. (Of course, if you prefer, you can copy the MenuBar= values to the Menu= line.) Now save the file and exit Notepad.

FIGURE 4: 'CANVAS' IS ONE of the Windows Media Player skins you can add to a theme.

To see the difference, you'll have to open the Display Properties dialog box, select the theme again, and click *OK* or *Apply.* But in the future, your menu and menu bars will be more harmonious.

A Media Player skinning (XP only): If you use the version of Windows Media Player that comes with XP, you can change its look by clicking *Skin Chooser* on the left or by choosing *View•Taskbar•Skin Chooser* and double-clicking a skin name in the list on the left. To download additional skins, click the *More Skins* button above the skin list, or use your favorite Web search engine to find compatible Media Player skins. Once you've selected a skin that fits your desktop theme, you'll probably want Media Player to use it automatically every time you apply that theme.

To do that, you have to edit the .theme file. Follow the steps identified in the previous tip to use Notepad or another text editor to open the .theme file you want to associate with a particular Media Player skin. Scroll to the bottom, click after the last line, and press **<Enter>** a couple of times to add some carriage returns. Then type **[Other]** and press **<Enter>**. On the next line, type **WindowsMediaPlayerSkin=** followed by the name of your preferred skin, as listed in Media Player, and the **.wmz** extension (see **FIGURE 3**). To see all eligible skin files, go to the Program Files\Windows Media Player\Skins folder. For example, **FIGURE 4** shows the Canvas skin.

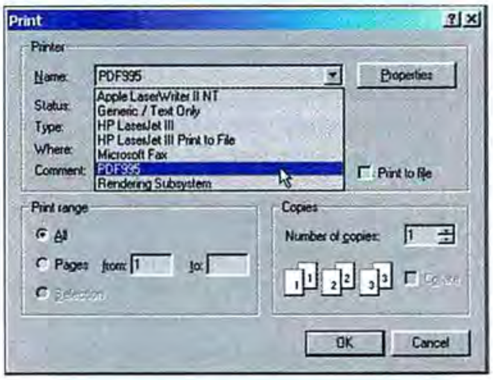
Capitalization is not important, but take care to reproduce any spaces in the name. For example, when you finish, the line may look like: 'WindowsMediaPlayerSkin=Plus! da Vinci.wmz'. End by saving the file and exiting your text editor.

Now when you apply your theme, Windows Media Player will adopt your chosen skin. (Naturally, Media Player must be running in skin mode.) Unfortunately, when you save over an existing theme from the Desktop Properties dialog box, Windows deletes the skin information from that file. If you update your themes, you'll have to type the Media Player skin information back into the .theme file. Note that Desktop Architect will not apply the Media Player skin; instead, you must apply the skin through the Desktop Properties dialog box, or use an XP-aware theme changer such as Style XP. ■

WINDOWS TOOLBOX

Make PDFs for Free

ADOBE SYSTEMS' Acrobat Portable Document Format is great for creating documents that look the same on Windows, Mac OS, Unix, and most other computer platforms. You can open any PDF with the free Acrobat Reader program, available at find.pcworld.com/31337, but making a PDF requires the full $249 version of Acrobat 5. Or it did until Pdf995 came along. This free software lets you turn any document into a basic PDF just by printing to the special Pdf995 printer driver that the program installs. Pdf995 lacks the fancy features of Acrobat, and it may not reproduce complex documents with complete accuracy, but you still get a lot of bang for no bucks. (You can create five free PDF files at Adobe's Create PDF Web site, but file size and processing time are limited.) To make simple changes to a PDF, or to add digital signatures, check out PdfEdit995 and Signature995, both of which are also free. For $10 per app, or $20 for all three, you can nix the advertising that accompanies the free versions. Go to find.pcworld.com/31343 to download the programs.



Name: PDF995

from: 1

Number of copies: 1

Send Windows-related questions and tips to scott_dunn@pcworld.com. Windows Tips *pays $50 for published items. Visit find.pcworld.com/31607 for more* Windows Tips. *Scott Dunn is a contributing editor for* PC World.

Best

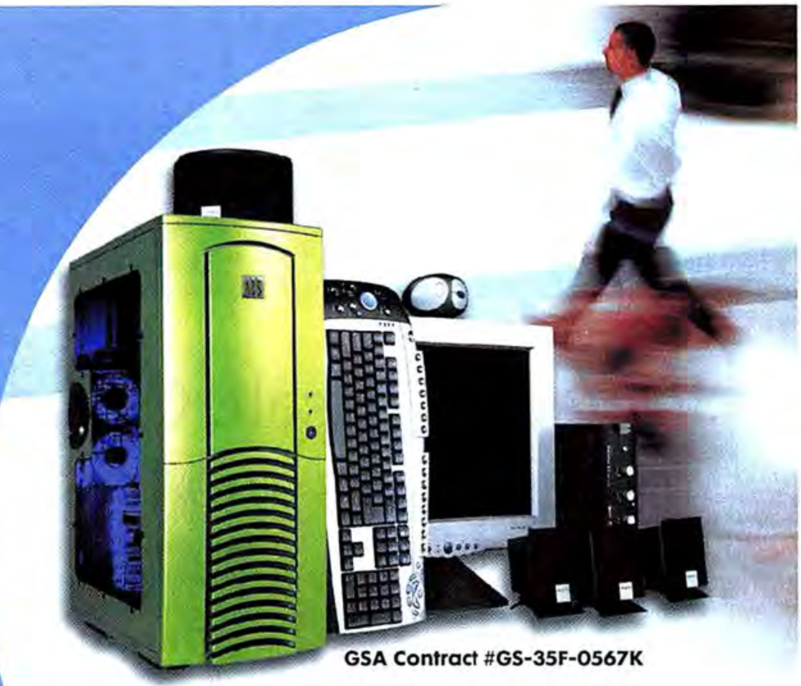
"Fast performance, featured-packed configuration and stylish case design." -- CNET.com

Overall

"Combines a traditional design and affordable price with fast performace and excellent sound capabilities." -- PC World

Value

"ABS crafted a highly desirable system that doesn't feel like a bargain-basement closeout... it feels like a steal!" -- ZDNet



GSA Contract #GS-35F-0567K

The best technology & service–always!

3 Year Limited Parts Warranty

Lifetime Labor Warranty

30 Days Money Back Guarantee

Optional 24 Hours Tech Support Available

Free System Set-up Guide and User Manual

Free System Recovery CD

EXTREME PERFORMANCE
FOR WINDOWS® XP

Boost software performance with QuantiSpeed™ architecture

Make gaming opponents wish they had an AMD Athlon™ XP processor

3DNow! Professional technology brings digital photos and video files to life with rich, vibrant colors and textures

Enjoy efficient multitasking when using multiple peripherals

ABS™ Ultimate M2

September 2002

Chieftec Aluminum Case w/Acrylic Windows 400-Watt PS & Neon Light
(Color Option: Green/Yellow/Blue/Silver/Black)
MSI KT4 Ultra ATA133 KT400 Chipset Motherboard w/USB 2.0
Corsair 512MB Fast PC3200 400MHz DDR SDRAM Memory
Two 60GB 7200RPM Ultra ATA Hard Drives
Pioneer 16X DVD Player & Mitsumi 1.44MB Floppy Drive
Plextor 40X12X40 BURN-Proof™ CD-ReWritable Drive
NVIDIA® GeForce™4 Ti 4600 w/128MB Video Card
NEC 19" .22mm 1600X1200 Color Monitor
Creative SoundBlaster Audigy XGamer Sound Card w/IEEE 1394 & Mic
Creative Inspire 5.1 5200 Subwoofer/Speakers
Integrated Network Controller & V.92 PCI 56K Modem
Logitech Cordless Elite Duo Keyboard and Mouse
Microsoft Windows® XP Home Edition
Free 7/24 Tech Support and 1 Year Onsite Service
Free ABS™ PC Organizer (3" Color Binder for Manual, Drivers, etc.)

$1979 AMD Athlon™ XP Processor 2800+ with QuantiSpeed™ architecture* outperforms competitive 2.8GHz processors

$1879 AMD Athlon™ XP Processor 2400+ with QuantiSpeed™ architecture** outperforms competitive 2.4GHz processors

ABS™ Awesome 3250

Chieftec Aluminum Case w/Acrylic Windows 400-Watt PS & Neon Light
(Color option: Green/Yellow/Blue/Silver/Black)
MSI KT4 Ultra ATA133 KT400 Chipset Motherboard w/USB 2.0
Corsair 512MB Fast PC3200 400MHz DDR SDRAM Memory
40GB 7200RPM Ultra ATA Hard Drive
Pioneer 16X DVD Player & Mitsumi 1.44MB Floppy Drive
Lite-On 48X24X48 BURN-Proof™ CD-ReWritable Drive
NVIDIA® GeForce™4 MX440 8X AGP 64MB Video Card
Add SONY 19" .24mm 1600X1200 Color Monitor @$309
Integrated Hardware SoundBlaster 5.1 Audio Controller & Mic
Altec Lansing AVS500 Subwoofer/Speakers
Integrated Network Controller & V.92 PCI 56K Modem
Microsoft Internet Keyboard & IntelliMouse
Microsoft Windows® XP Home Edition
Free 7/24 Tech Support and 1 Year Onsite Service
Free Software: Corel WordPerfect Office 2002 CD
Free ABS™ PC Organizer (3" Color Binder for Manual, Drivers, etc.)

$1039 AMD Athlon™ XP Processor 2600+ with QuantiSpeed™ architecture** outperforms competitive 2.6GHz processors

$ 969 AMD Athlon™ XP Processor 2400+ with QuantiSpeed™ architecture***outperforms competitive 2.4GHz processors

ABS™ Awesome 3120

Enermax Full-Tower Case w/300-Watt PS Beige or Black Color
NVIDIA® nForce™2 DDR400 8X AGP Motherboard w/Dual LAN
Corsair 512MB Fast PC3200 400MHz DDR SDRAM Memory
80GB 7200RPM Ultra ATA Hard Drive
Lite-On 16X DVD Player & Mitsumi 1.44MB Floppy Drive
Lite-On 48X24X48 BURN-Proof™ CD-ReWritable Drive
NVIDIA® GeForce™4 Ti4200 w/128MB 8X AGP Video Card
Add NEC 19" .25mm 1024X768 Color Monitor @$269
Integrated Audio Controller & Mic
Creative Inspire 4.1 4400 Subwoofer/Speakers
PCI 10/100 Network Controller & V.92 PCI 56K Modem
Multimedia Keyboard & Scrolling Internt Easy + Mouse
Microsoft Windows® XP Home Edition
Free 7/24 Tech Support and 1 Year Onsite Service
Free Software: Corel WordPerfect Office 2002 CD
Free ABS™ PC Organizer (3" Color Binder for Manual, Drivers, etc.)

$1029 AMD Athlon™ XP Processor 2400+ with QuantiSpeed™ architecture** outperforms competitive 2.4GHz processors

$ 999 AMD Athlon™ XP Processor 2200+ with QuantiSpeed™ architecture*** outperforms competitive 2.2GHz processors

ABS™ Bravado 2230

InWin S506 300 Watts Black Mid Tower Case
ASUS VIA A7V333 Chipset ATX Motherboard with RAID
Kingston 512MB Fast PC2700 333MHz DDR SDRAM Memory
80GB 7200RPM Ultra ATA Hard Drive
Pioneer 16X DVD Player & Mitsumi 1.44MB Floppy Drive
Lite-On 48X24X48 BURN-Proof™ CD-ReWritable Drive
NVIDIA® GeForce™4 Ti4200 w/64MB Video Card
Add NEC 19" .25mm 1024X768 Color Monitor @$269
Integrated Audio Controller & Mic
Logitech Z-340 3-Piece Speakers System
PCI 10/100 Network Card & V.92 PCI 56K Modem
Microsoft Internet Keyboard & IntelliMouse
Microsoft Windows® XP Home Edition
Free 7/24 Tech Support and 1 Year Onsite Service
Free Software: Corel WordPerfect Office 2002 CD
Free ABS™ FC Organizer (3" Color Binder for Manual, Drivers, etc.)

$ 999 AMD Athlon™ XP Processor 2200+ with QuantiSpeed™ architecture*** outperforms competitive 2.2GHz processors

$ 929 AMD Athlon™ XP Processor 2000+ with QuantiSpeed™ architecture**** outperforms competitive 2.0GHz processors

ABS™ PCs use genuine Microsoft® Windows®
www.microsoft.com/piracy/howtotell

ABS™ recommends Microsoft® Windows® XP

800.230.4233

Please use full URL to get latest prices and special promotions.

www.abspc.com/pw01

Sales Hours: Mon-Fri 8:30AM-5:30PM PST Technical Support: Mon-Fri 8:30AM-5:30PM PST
Technical Support: 800-685-3471 General Office: 562-695-8823 9997 East Rose Hills Road, Whittier, CA 90601

Price, specification, and terms are subject to change without notice. Illustrations may not accurately represent exact configurations priced. ABS™ is not responsible for errors in typography and/or photography. 30-day money back guarantee does not include opened software, parts, or special order merchandise. Original shipping and handling fee along with return shipping charge are non-refundable. Products returned after 30 days or in a non-refundable condition are subject to a restocking fee. Onsite service may be provided by contracted third party provider. Technician will be dispatched if necessary following phone support. AMD, the AMD Arrow logo, AMD Athlon, AMD Duron, and combinations thereof are trademarks of Advanced Micro Devices, Inc. *QuantiSpeed™ architecture operates at 2.133GHz. **QuantiSpeed™ architecture operates at 2.0GHz. ***QuantiSpeed™ architecture operates at 1.8GHz. ****QuantiSpeed™ architecture operates at 1.67GHz.

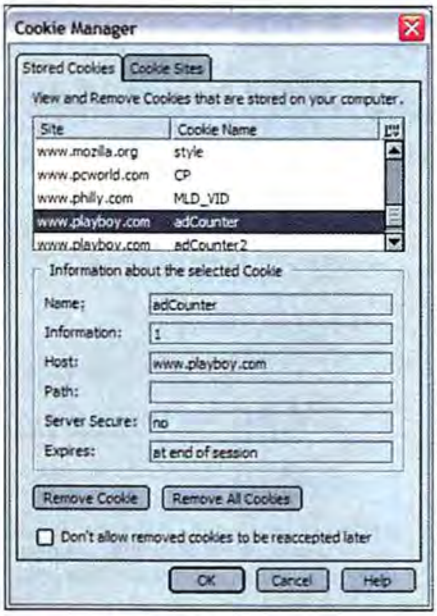
INTERNET TIPS

SCOTT SPANBAUER

Protect Yourself: Clear Your Cookies and History

COOKIES ARE A THREAT to your privacy, though not in the way you probably think. The cookie files that Web sites use to personalize your online experience aren't immune to online snoops. But they're much more likely to reveal your surfing habits, shopping preferences, and private yearnings to nosy coworkers, kids, system administrators, and bosses who may poke around in your computer while you're momentarily away.

To uncover the secrets that your cookies reveal in Internet Explorer 6, choose *Tools•Internet Options* and—under the General tab—click the *Settings* button in the 'Temporary Internet files' area. In the Settings dialog box, click the *View Files* button. In either Mozilla 1.1 or Netscape 7, choose *Tools•Cookie Manager•Manage Stored Cookies* (see **FIGURE 1**). In Netscape 6.2, choose *Edit•Preferences*, select *Cookies* under the Privacy & Security category, and then click the *View Stored Cookies* button to open the Cookie Manager.



View and Remove Cookies that are stored on your computer.

Site	Cookie Name
www.mozilla.org	style
www.pcworld.com	CP
www.philly.com	MLD_VID
www.playboy.com	adCounter
www.playboy.com	adCounter2

Information about the selected Cookie

Name: adCounter
Information: 1
Host: www.playboy.com
Path:
Server Secure: no
Expires: at end of session

☐ Don't allow removed cookies to be reaccepted later

FIGURE 1: COVER YOUR tracks in Netscape by deleting unwanted cookies and history.

You may be a little surprised at the information you'll find: cookies containing URLs to racy magazines, job-seeking sites, shopping sites, and other revealing destinations. Fortunately, removing an individual unwanted cookie is easy. In IE, right-click the cookie's name in the Temporary Internet Files window you opened above, and choose *Delete*. To remove all cookies, choose *Tools•Internet Options* and click the *Delete Cookies* button. In Netscape, select a cookie in the Stored Cookies list and click the *Remove Cookie* button. You can erase all your cookies by clicking the *Remove All Cookies* button.

You're not finished yet, though. All browsers keep a history of all the URLs you've visited. To remove individual history items in Internet Explorer, Mozilla, or Netscape, press **<Ctrl>-H** to open the History Explorer Bar and right-click a history site domain name, an individual page URL, or an entire day's or week's worth of browsing history in the list. Now choose *Delete*. To erase all history entries in IE, choose *Tools•Internet Options* and click the *Clear History* button.

To accomplish the same thing in Netscape/Mozilla, click *Edit•Preferences*, select *History* under the Navigator category, and click the *Clear History* button.

In Netscape browsers, however, you must take an additional step: Choose *Edit•Preferences*, select *History* under the Navigator category, and then click the *Clear Location Bar* button.

STREAM A LITTLE STREAM

WITH STREAMING Internet radio under attack by the recording industry, it may be time to take matters into your own hands. Since I last wrote about Internet radio, in August 2002 (find.pcworld.com/31535), many stations have shut down due to high royalty rates. Into the fray rides PeerCast.org's free streaming client and server. PeerCast lets you set up anonymous streaming broadcasts using the same Gnutella peer-to-peer protocol that powers the Morpheus and Kazaa file-sharing systems. In addition to shielding your identity, PeerCast reduces the bandwidth required to broadcast. Because each listener's PC can also be a replicating server, you may reach thousands of listeners using only a 56-kbps modem connection.

Right now, PeerCast is beta software, and though it usually works fine, you'll need to read the broadcast configuration instructions at find.pcworld.com/31220 carefully. For just listening to PeerCast broadcasts, download and install the software from find.pcworld.com/31223, and then pick your station from the PeerCast system tray icon's menu. ■

Send your questions and tips to nettips@spanbauer.com. We pay $50 for published items. See find.pcworld.com/31523 for more Internet Tips. *Scott Spanbauer is a contributing editor for* PC World.

KILL POP-UPS WITH MOZILLA

PC WORLD OCCASIONALLY covers the many handy tools that prevent annoying pop-up and pop-under advertisement windows from littering your screen. However, if you use the free open-source Mozilla browser, you don't need an add-on utility. It's not an obvious feature, but the program has its own built-in pop-up killer hidden deep in the Preferences dialog box. To quash pop-ups in Mozilla 1.1, choose *Edit•Preferences*, double-click the *Advanced* category, select *Scripts & Plugins*, uncheck *Open unrequested windows* in the 'Allow scripts to' pane (your system may say 'Allow webpages to' instead), and click *OK*.

Dual-Band

802.11a
802.11b

LINKSYS
5GHz +2.4GHz

Wi Fi™
CERTIFIED

Wireless Dual-Band Access Point

estimated street price **$299**

- Protects your wireless investment
- Works simultaneously with both the 2.4GHz 802.11b and 5GHz 802.11a standards
- Wireless security with up to 152-bit WEP and MAC address filtering helps keep intruders off your network
- Enjoy the freedom of wireless today, without the worry of a costly upgrade tomorrow

[The Best of Both Worlds]

802.11b + 802.11a together at last

The Dual-Band Access Point (WAP51AB) is available NOW.
Call 1-800-546-5797 or visit our web site at: www.linksys.com/dualband

LINKSYS®

Copyright © 2002 The Linksys Group, Inc. All rights reserved. Linksys and the Linksys logo are trademarks of The Linksys Group Inc. Additional logos, corporate names and trademarks stated herein are property of their respective holders.

STEP BY STEP

STAN MIASTKOWSKI

Set Antivirus Software for Maximum Protection

IT'S DANGEROUS out there on the wild and woolly frontier of the Internet. Whether you have an always-on cable or DSL connection or you use dial-up, you're on a road that can deliver all sorts of nasties directly to your PC through downloads or e-mail attachments. Virus writers are becoming increasingly clever. Antivirus software is your absolutely essential first line of defense—if you don't have antivirus software, you need to get it now.

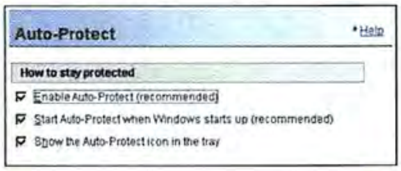
A wide variety of antivirus software is available. For a detailed look at how the top seven packages stack up, see the feature story "Protect Your PC" in the July 2002 issue (find.pcworld.com/31235).

The programs *PC World* has evaluated all provide an assortment of protection features, but each application sets its own defaults during installation. If you leave those out-of-the-box settings as is, or if you tinker with a few in an attempt to improve system performance, your PC may be unprotected in some crucial areas.

We've come up with a list of key settings that will help you ensure your PC is fully protected. All antivirus packages are different; some arrange options on easy-to-find summary screens, some bury options deep in submenus, and (to further complicate matters) some call virtually identical features by different names. The examples shown here are from Symantec's Norton AntiVirus 2003 and ETrust's EZ Antivirus. We can't show you the exact steps for every package, but the types of settings and the options you'll need to consider are similar. After you've found and enabled these settings, your PC will be on high alert. ■

Stan Miastkowski is a PC World *contributing editor. Contact him at stan_miastkowski@pcworld.com. Visit find.pcworld.com/31676 for past* Step-By-Step *columns.*

1 **Activate full-time protection.** Virtually every antivirus software package is capable of operating continuously, monitoring all files as they are used; confirm that this feature hasn't been inadvertently turned off. If your antivirus software offers a choice of which files to work on, choose all. In addition, enable special options such as ETrust's incoming- and outgoing-file scanning, shown here.

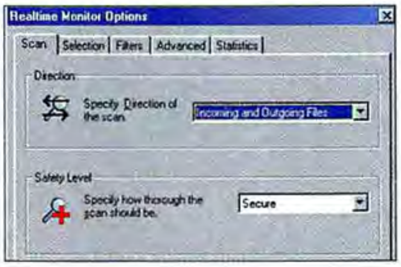

Auto-Protect

How to stay protected

☑ Enable Auto-Protect (recommended)

☑ Start Auto-Protect when Windows starts up (recommended)

☑ Show the Auto-Protect icon in the tray


Realtime Monitor Options

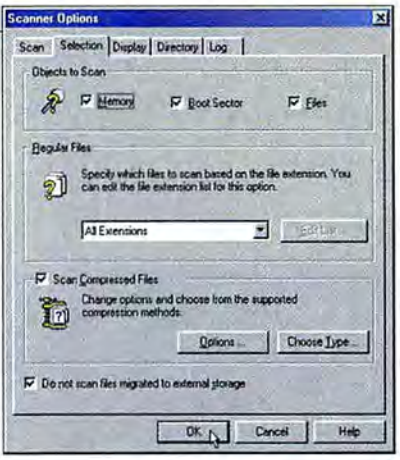
Direction

Specify Direction of the scan: Incoming and Outgoing Files

Safety Level

Specify how thorough the scan should be: Secure

2 **Ensure that all files are scanned.** Though some types of files are unlikely to contain viruses, technology—and the abuse of it—marches onward. It's important to have your antivirus program analyze all files on your PC, including compressed archives such as .zip files. To save time, some antivirus software neglects to scan compressed files and certain other file types. For maximum safety, set your software to scan everything.


Scanner Options

Objects to Scan

☑ Memory ☑ Boot Sector ☑ Files

Regular Files

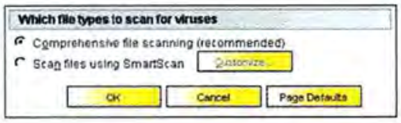
Specify which files to scan based on the file extension. You can edit the file extension list for this option.

All Extensions

☑ Scan Compressed Files

Change options and choose from the supported compression methods.

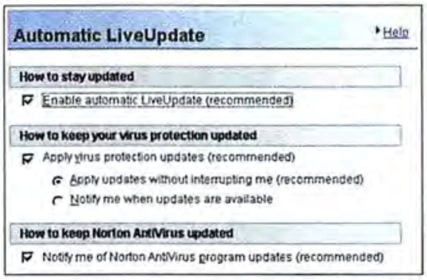
☑ Do not scan files migrated to external storage


Which file types to scan for viruses

● Comprehensive file scanning (recommended)

○ Scan files using SmartScan

3 **Turn on automatic updating.** The most critical step in maintaining your antivirus software's effectiveness is keeping the all-important virus signature file, which contains information about the latest viruses, up-to-date. Setting up automatic updating is vital. When this option is enabled, programs such as Norton AntiVirus check for updates via the Internet periodically, whenever your computer is connected to the Net. With some other antivirus apps, you need to specify when the program should check for updates; checking at least once a day is a good idea. All packages let you check for updates manually, which you might do if the news wires are running stories on a fresh virus outbreak.


Automatic LiveUpdate

How to stay updated

☑ Enable automatic LiveUpdate (recommended)

How to keep your virus protection updated

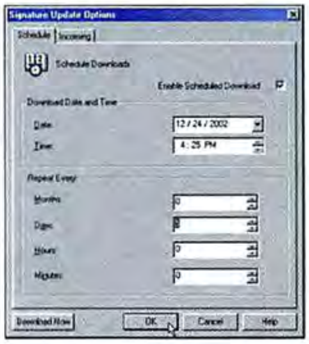
☑ Apply virus protection updates (recommended)

● Apply updates without interrupting me (recommended)

○ Notify me when updates are available

How to keep Norton AntiVirus updated

☑ Notify me of Norton AntiVirus program updates (recommended)


Signature Update Options

Schedule Downloads

Enable Scheduled Download ☑

Download Date and Time

Date: 12 / 24 / 2002

Time: 4 : 25 PM

Repeat Every

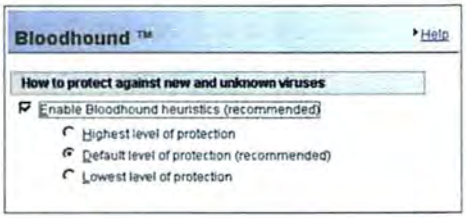
Months: 0

Days: [illegible]

Hours: 0

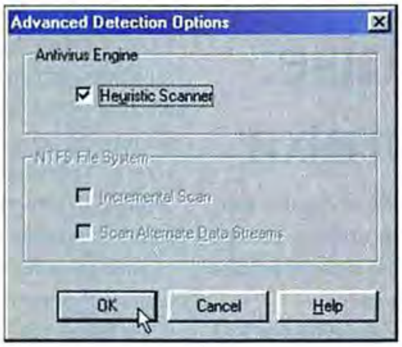
Minutes: 0

4 Activate heuristic scanning. New viruses can circulate so rapidly that your system can get caught in an outbreak before your antivirus software vendor can update its signature file or virus definitions. That's why most antivirus software includes heuristic scanning, which tracks viruslike activity outside of formal definitions. Confirm that this feature is activated. It often goes by different names: ETrust simply calls it heuristic scanning, while Norton AntiVirus calls it Bloodhound and McAfee VirusScan dubs it H.A.W.K.



How to protect against new and unknown viruses

☑ Enable Bloodhound heuristics (recommended)
- ○ Highest level of protection
- ● Default level of protection (recommended)
- ○ Lowest level of protection



Antivirus Engine

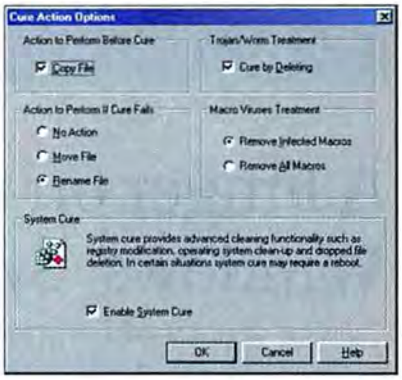
☑ Heuristic Scanner

NTFS File System

☐ Incremental Scan

☐ Scan Alternate Data Streams

5 Choose automatic repair. Pay attention to the setting that controls what your software does when it finds an infected file. For most users, the best choice is automatic repair (if your software offers it). Some call it by a different name (ETrust, shown here, calls it System Cure). Several packages require more user intervention. Note that certain viruses can't be automatically repaired; in those cases, your software will give you more instructions.



Action to Perform Before Cure
☑ Copy File

Trojan/Worm Treatment
☑ Cure by Deleting

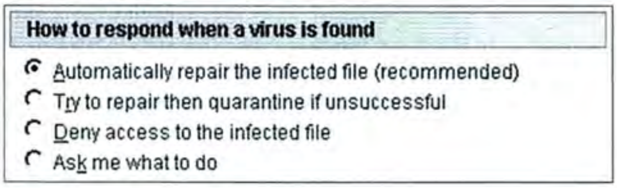
Action to Perform If Cure Fails
- ○ No Action
- ○ Move File
- ● Rename File

Macro Viruses Treatment
- ● Remove Infected Macros
- ○ Remove All Macros

System Cure

System cure provides advanced cleaning functionality such as registry modification, operating system clean-up and dropped file deletion. In certain situations system cure may require a reboot.

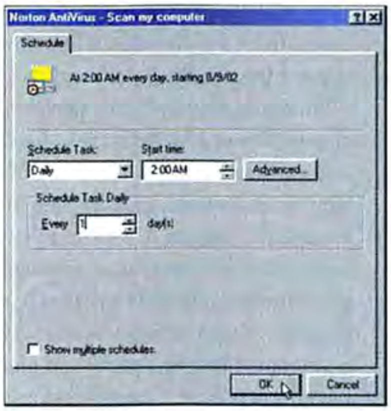
☑ Enable System Cure



How to respond when a virus is found

- ● Automatically repair the infected file (recommended)
- ○ Try to repair then quarantine if unsuccessful
- ○ Deny access to the infected file
- ○ Ask me what to do

6 Schedule automatic full-system scans. Even though all antivirus packages allow continuous scanning, you should regularly schedule a scan of your entire system to find any viruses that might have slipped through your PC's perimeter. Most packages allow you a great deal of control over when and how often to scan. If your PC is always turned on, you can schedule a scan overnight. If not, schedule the scan for a slack time when your computer is on. For the greatest level of security, do a complete scan once a day—though once a week is sufficient if you don't use your PC all the time. You can also run a full scan manually at any time.



At 2:00 AM every day, starting 8/9/02

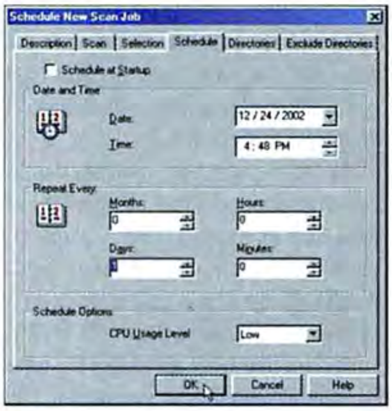
Schedule Task: Daily

Start time: 2:00 AM

Schedule Task Daily

Every 1 day(s)

☐ Show multiple schedules



☐ Schedule at Startup

Date and Time

Date: 12 / 24 / 2002

Time: 4 : 48 PM

Repeat Every

Months: 0

Hours: 0

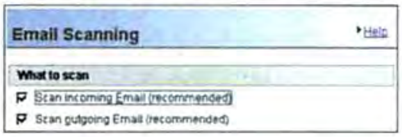
Days: 1

Minutes: 0

Schedule Options

CPU Usage Level: Low

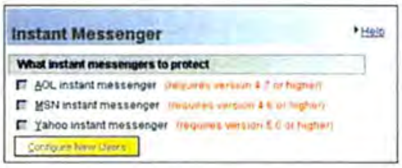
7 Enable special features. Some of the newest antivirus software includes additional, distinctive features, such as the e-mail and instant-message scanning shown here in Norton AntiVirus 2003. Though you may have to dig deeply in the options menus of some packages to find them, the wisest choice is to have all special features enabled.



What to scan

☑ Scan incoming Email (recommended)

☑ Scan outgoing Email (recommended)



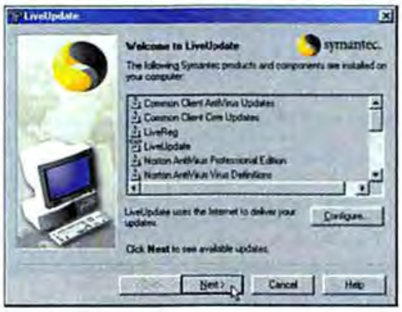
What instant messengers to protect

☐ AOL instant messenger (requires version 4.7 or higher)

☐ MSN instant messenger (requires version 4.6 or higher)

☐ Yahoo instant messenger (requires version 5.0 or higher)

8 Update virus definitions. Since you're already playing around with your antivirus software, go ahead and manually update your virus definitions, even if you've scheduled an automatic live update for later the same day. Trying out this feature now is good practice for the next time a major virus hits and you want the latest protection.



Welcome to LiveUpdate

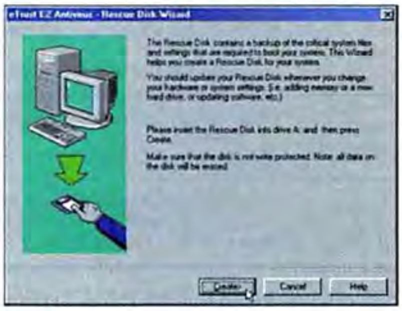
The following Symantec products and components are installed on your computer:

- Common Client AntiVirus Updates
- Common Client Core Updates
- LiveReg
- LiveUpdate
- Norton AntiVirus Professional Edition
- Norton AntiVirus Virus Definitions

LiveUpdate uses the Internet to deliver your updates.

Click **Next** to see available updates.

9 Make backup disks. Finally, use your antivirus software's ability to create emergency backup disks. All packages offer this option, which is crucial for killing some viruses that can't be automatically repaired. The disks will also allow you to restart your system if a virus gets through the security perimeter and you can't reboot your PC.



The Rescue Disk contains a backup of the critical system files and settings that are required to boot your system. This Wizard helps you create a Rescue Disk for your system.

You should update your Rescue Disk whenever you change your hardware or system settings (i.e. adding memory or a new hard drive, or updating software, etc.)

Please insert the Rescue Disk into drive A: and then press Create.

Make sure that the disk is not write protected. Note: all data on the disk will be erased.

HARDWARE TIPS

KIRK STEERS

A Finger on the PC Pulse: Windows' System Monitor

WINDOWS' SYSTEM Monitor utility lets you nurture your inner geek and keep an eye on your PC's performance at the same time. In Windows 98 and Me, you'll find System Monitor by clicking *Start•Programs•Accessories•System Tools.* (If it's not there, select *Start•Settings•Control Panel,* open *Add/Remove Programs,* select the *Windows Setup* tab, scroll down the Components list, double-click *System Tools,* and check *System Monitor.*) In Windows XP and 2000, open Control Panel, double-click *Administrative Tools,* and then double-click *Performance.*

The PC performance statistics that System Monitor tracks include memory use, hard disk operations, and network connections. You can watch the numbers or graphs change in real time on your screen as your PC adjusts to the needs of different programs. It's a great tool for identifying which programs stress your CPU, when your hard disk is most active, and how your PC uses its memory.

The version of System Monitor in Windows 98 and Me provides dozens of performance statistics, and the XP version has hundreds. Many of these are so technical that they're of little use to the average PC user, but a few are very useful. **FIGURE 1** lists some of the most important stats to track in both versions.

To set or remove what's being watched in Windows 9*x* or Me, use the *Edit* menu: In the *Add Item* dialog box, pick a Category and then an Item. In XP and 2000, right-click the blank area on the graph, click *Add Counters,* select a *Performance* object from the drop-down list, choose a counter from the list below, and click *Add.*

Watching your system's performance change as you add and remove hardware and software can tell you which of your components need a tune-up, and, if necessary, an upgrade. Go to find.pcworld.com/31382 for information on using System Monitor to identify memory leaks in Windows XP. (Memory leaks occur when a program allocates a portion of memory but fails to release it, causing errors when other programs are later loaded.)

If you find a leaky program, check the vendor's Web site for updates that may fix the problem. If the updates don't help, or if none are available, try reinstalling the program. It may have a corrupted file.

WHAT TO WATCH IN SYSTEM MONITOR

TO TRACK...	While using...	Choose...	And...	Comments
RAM	Windows XP/2000	Performance object: *Memory*	Counter: *Available bytes*	Shows which apps use the most memory. Values under 4MB indicate a memory bottleneck.
	Windows Me/98	Category: *Memory manager*	Item: *Unused physical memory*	
Virtual memory	Windows XP/2000	Performance object: *Paging file*	Counter: *% Usage*	Indicates when your swap file gets the most use.
	Windows Me/98	Category: *Memory manager*	Item: *Swap file in use*	
CPU usage	Windows XP/2000	Performance object: *Processor*	Counter: *% Processor time*	If values are consistently over 85%, CPU is overworked; could mean a significant bottleneck.
	Windows Me/98	Category: *Kernel*	Item: *Processor usage (%)*	

FIGURE 1: KEEP AN EYE ON THESE System Monitor settings to avoid PC problems.

MONITOR LONGEVITY

? **WHAT CAN I DO to prolong the life of my monitor? I've been told that a screen saver program can help keep the screen from burning out, but I've also heard that it makes no difference.**

Alice Grigg, Joplin, Missouri

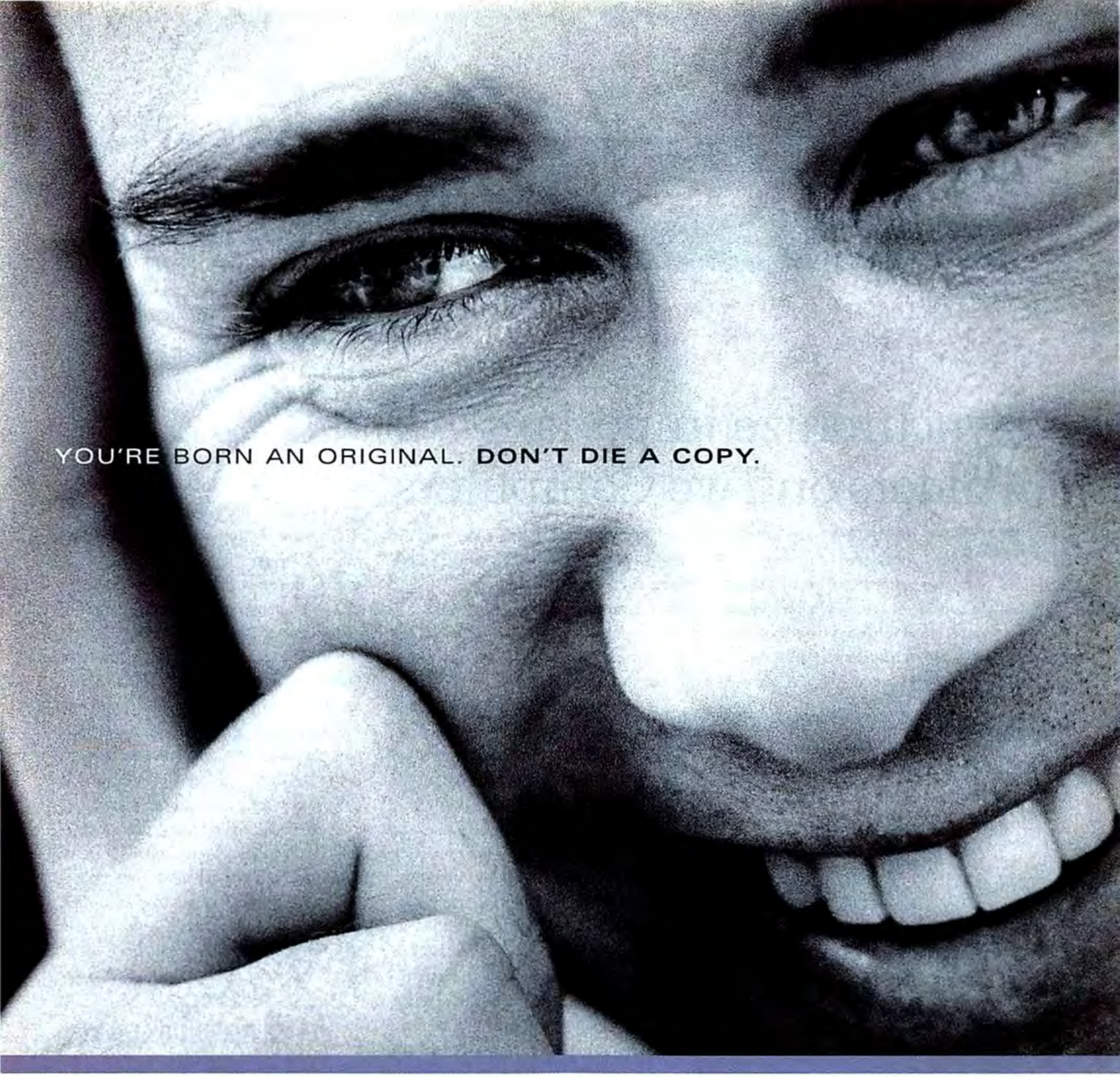
BACK IN THE heyday of monochrome monitors, screen savers kept characters (such as DOS's "C:\" prompt) and images from being permanently burned into the screen. Today's monitors aren't as susceptible to screen burn. In fact, using a screen saver may actually shorten the life of your monitor. Your best bet for prolonging your monitor's life is to shut it off when you're not using it. For most monitors, Windows can be set to automatically power down the screen after a period of inactivity. In Windows 98 and Me, click *Start•Settings•Control Panel•Power Management* and select a time from the drop-down menu next to 'Turn off monitor' under the *Power Schemes* tab. The applet is called Power Options in Windows 2000 and XP, but the steps are about the same.

XP AND COMPATIBILITY

IT MAY BE HARD to believe, but Windows XP isn't perfect. (Okay, maybe it's not hard to believe.) Like the first version of any OS, XP doesn't work with all the hardware out there. Before you upgrade your PC's operating system or buy hardware for a Windows XP system, check its compatibility. Microsoft maintains a list of hardware certified as Windows XP compatible. Go to find.pcworld.com/31406 to search the list.

Your monitor's worst enemy is heat (although water is a close second). If your display is running hot, add a fan such as 3DCool's $10 Monitor Cooler; it's cheap and easy to install. Go to find.pcworld.com/31400 for more information. ■

Go to find.pcworld.com/31511 for past Hardware Tips *columns. Kirk Steers is a* PC World *contributing editor.* Hardware Tips *welcomes your tips and questions and pays $50 for published items.*


YOU'RE BORN AN ORIGINAL. DON'T DIE A COPY.

We Know You're Not A Clone.

You demand a computing experience that fits your needs. We understand. That's why Antec's products are as unique as you. So here's the new PlusView – with all the features of our award-winning Performance Plus cases, our high-clarity side window, and without a power supply. Choose from Antec's high performance power, cooling, and illumination products to customize and showcase a PC that's uniquely yours. That's *the Power of You.*

To view our full line of products, visit us at www.antec-inc.com

Antec
The Power of You

BEST BUY · STAPLES · MICRO CENTER · J&R · buy.com · GLOBAL · COMPUSA WHERE AMERICA BUYS TECHNOLOGY. · CDW

ANSWER LINE

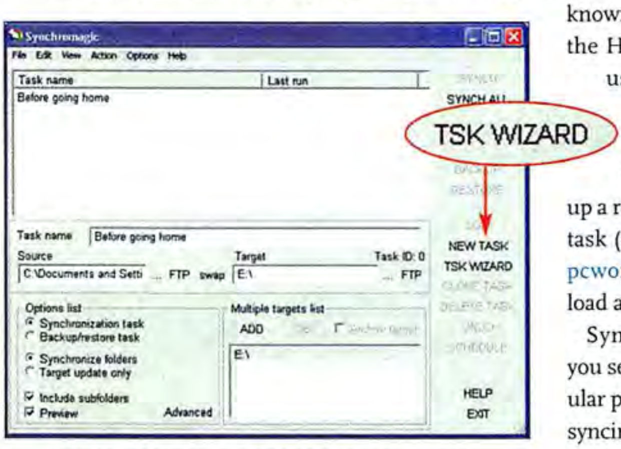
LINCOLN SPECTOR

TASK SCHEDULER AND PASSWORDS **SAVE WINDOWS UPDATES TO DISK** **EASY WINDOWS MACRO RECORDING**

Synchronize Important Folders on Two Computers

? WHAT'S THE BEST way to transport files between my work and home computers? I want a simple way to copy all of the files I've worked on during the day so I can bring them home—and of course, return them to work afterward.

Parvez Sopariwala, Grand Rapids, Michigan



Before going home

Task name: Before going home

Source: C:\Documents and Setti

Target: E:\

Task ID: 0

● Synchronization task
○ Backup/restore task

● Synchronize folders
○ Target update only

☑ Include subfolders
☑ Preview

E:\

FIGURE 1: SYNC FILES BETWEEN two computers simply and easily with the Synchromagic Pro utility.

MICROSOFT WINDOWS has a tool for this called Briefcase. Unfortunately, Briefcase has so many flaws, it's really not worth using. Just one example: If you create the file on your work computer, Briefcase doesn't want you to copy it to your home computer's hard drive. Instead, you're supposed to access it exclusively from your removable media—not a particularly fast or efficient way to work.

There are at least two better solutions: one involves shareware, and the other uses an old DOS command that's still available (even in Windows XP). Both work with hard drives as well as with Zip drives, CD-RW (via packet-writing software such as Roxio's DirectCD), and other removable media.

First, the shareware way: GeloSoft's Synchromagic Home ($20 registration fee) or Synchromagic Pro ($30, formerly known as Synchronix). Though the Home version is easier to use than the Pro version, the Pro edition adds the very nice Tsk Wizard, which simplifies setting up a repeatable synchronization task (see **FIGURE 1**). Go to find.pcworld.com/31454 to download a trial version of either.

Synchromagic Pro also lets you set up a task to run a particular program before or after the syncing, sync only files within a particular date range, exclude particular folders or extensions, and shut down the computer when it's all over. The program can use FTP to sync files over the Internet, and it even works as a backup utility.

Now the no-cost method: Right-click a blank space on the desktop or in Windows Explorer's right pane and select *New•Shortcut*. In the text box on the first page of the Create Shortcut wizard, enter **xcopy "***import folder name***\*.*" ***x***:\transfer /d /y /s**, where *import folder name* is the location (including drive) and name of the folder you want synced with the other computer, and *x* is the drive letter of your removable medium. For instance, if you want to share the contents of "C:\My Documents" via your E: drive, enter **xcopy "C:\My Documents\*.*" e:\transfer /d /y /s**. Be careful to get the quotation marks, forward and back slashes, and spaces right.

After entering the import file's location, click *Next*. Name the shortcut **Export** and then click *Next* (to be prompted to choose an icon for the shortcut) or *Finish*. In Windows 98 and Me, right-click the shortcut and select *Properties*. Click the *Program* tab, check *Close on exit*, and click *OK*.

Now creating the second shortcut is easy. Select the first one and press **<Ctrl>-C**, then **<Ctrl>-V**. This will create a new shortcut called Copy of Export. Right-click it and select *Properties*. Click the *Shortcut* tab and reverse the two paths so that the one to the transfer folder on your removable medium comes before the one to the hard-drive folder. For instance, change the example above to **xcopy e:\transfer "C:\My Documents\*.*" /d /y /s**. Click *OK*, and then rename the new shortcut **Import**.

Remember to create both of these shortcuts on your home and work computers, set to the different folder locations and drive letters for your removable media.

At the end of the workday, put a disk in the drive and click your *Export* shortcut. When you get home, boot the other computer, put the disk in the drive, and click your *Import* shortcut. Reverse the process to move files from your home machine to your work machine. ▶

BETTER MSCONFIG CLEANER

IN THE OCTOBER 2002 *Answer Line* column, I gave instructions for editing the Registry to clean out programs that are unchecked when you view Msconfig (see find.pcworld.com/31661). Several readers suggested various freeware programs that make the job easier. The best was CodeStuff's free Starter utility, recommended by Donald Bregman of Boynton Beach, Florida. You can download Starter at find.pcworld.com/31664. Once you've installed and launched Starter, click the *Options* icon, check *MSConfig compatibility*, and click *OK*. Now simply right-click any program you want to remove, select *Delete*, then *OK*.

ALL THIS AND MORE AT NETSCAPE.COM

News from CNN. Scores from Sports Illustrated. The latest from Entertainment Weekly, People and InStyle. Plus Instant Messenger, MapQuest, weather, search and email. The list goes on and on. See for yourself.

Visit the new Netscape.com today.

Netscape™

© 2002 Netscape Communications Corp. Photos are the copyrighted property of their respective owners and are used with permission. Netscape.com, the Netscape logo, CNN.com, CNNSI.com, EW.com, InStyle.com, People.com, and Time.com are trademarks of the AOL Time Warner, Inc. companies. All other trademarks are the exclusive property of their respective owners. All rights reserved.

SCHEDULE TASKS IN XP

I BOUGHT BackUp MyPC to do unattended backups, but when the scheduled task is supposed to run, Windows XP's task scheduler tells me it has the wrong user and password. I am the only user, and I don't use a password. What gives?

Gene Madsen, Fort Collins, Colorado

LIKE MANY programs, BackUp MyPC uses the scheduler built into Windows XP by default, and its own only if the Windows Task Scheduler is disabled or not functioning. This makes sense—why have more than one scheduler running at a time? But the XP task scheduler won't work unless you have a system password, and each task you run must know the password. There's a good reason for this, too: A rogue program can't use the scheduler to do something unpleasant at 2 a.m.

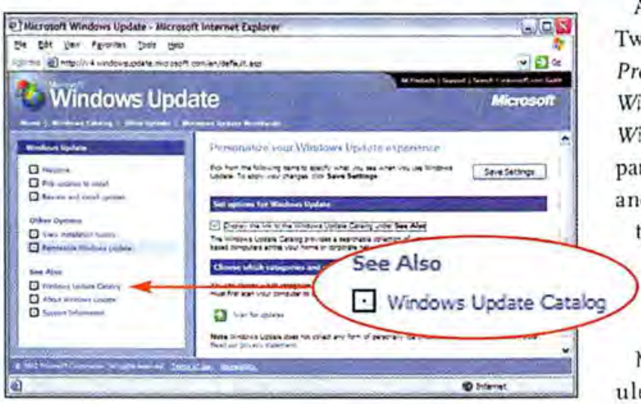


FIGURE 2: SAVE YOUR WINDOWS 2000 and XP updates to disk, rather than auto-updating, via this page on Microsoft's site.

I'll tell you how to set up a system password, then how to free yourself from having to type that password every time you boot. I'll also explain how to tell your existing scheduled tasks about your password so that they run properly.

To set up a password, select *Start•Control Panel*. Double-click the *User Accounts* icon (or select it from the Control Panel menu). In the User Accounts applet, double-click your account, and then click *Create a password* (if you already have a password, this option isn't available). Enter a password, enter it again to confirm it, and then type in a password hint to help jog your memory in case you forget it. (See find.pcworld.com/31466 for more info on Windows passwords.) Finally, click *Create Password*.

Now when your PC boots, Windows will ask for your password. This may be secure, but it's not convenient, and for many users, it's simply not necessary. If you don't worry about the wrong people logging in as you, use Microsoft's free Tweak UI for Windows XP to keep from being asked for a password. If you don't have it, go to find.pcworld.com/31469 to download a copy of PowerToys for Windows XP, which includes Tweak UI.

After you have installed Tweak UI, select *Start•All Programs•Powertoys for Windows XP•Tweak UI for Windows XP*. In the left pane, double-click *Logon* and click *Autologon*. In the right pane, choose *Log on automatically at system startup*. End by clicking *OK*.

Now tell your scheduled tasks about your password: Select *Start•All Programs•Accessories•System Tools•Scheduled Tasks*. Double-click a task. On the resulting dialog box's Task tab, click the *Set password* button. Type the password twice, and then click *OK* twice. Repeat for each task, and then close the Scheduled Tasks window.

WINDOWS UPDATES ON DISK

HOW DO I SAVE Windows updates? There must be a faster way to update multiple computers than by downloading the same huge files repeatedly.

Vinoy Mathew, Houston

MICROSOFT HAS Web pages for "corporate" Windows updates where you can download the files to disk rather than install them automatically. The hitch, of course, is that you have to remember what updates each PC has already installed, since you lose the convenience of the standard Windows Update program looking at your system and knowing instantly what needs to be changed.

Microsoft's tack on corporate downloads varies with the version of Windows (all the updates are free, however). Go to find.pcworld.com/31604 for more information on all of them. (Pay no heed to the notice about the site being "retired.") Here are some specifics:

Windows 2000 and XP: Microsoft provides a good update tool for these two operating systems. Click *Windows Update* (not the *Windows Update Catalog* link that appears earlier on the page) as if you were just updating that machine. In the left pane, click *Personalize Windows Update*. Check *Display the link to the Windows Update Catalog under See Also*, and then check *Save Settings*. The Windows Update Catalog, where you download the files, appears as an option in the left pane (see **FIGURE 2**).

Windows 98: Go to find.pcworld.com/31475 for a list of this OS's updates.

Windows Me: You can find a single security update for this Windows version at find.pcworld.com/31478.

BRING BACK RECORDER!

DO YOU KNOW OF ANY program that is able to replace Recorder, the Windows 3.1 utility that recorded and played back macros?

James Kelley, Hurst, Texas

I WOULD LOVE to recommend a free macro recorder, but I haven't been able to find one. Instead, you might try the $30 EZ Macros software from American Systems, which is a very good second choice. Direct your browser to find.pcworld.com/31481 to download a trial version.

EZ Macros uses a wizard to walk you through macro creation. The program's options are quite extensive. You can create macros with four types of functions: to launch programs; to play back recorded mouse clicks and keystrokes; to launch a program, then play back mouse clicks and keystrokes; and to display a menu of other macros. You can also launch a program by entering a keystroke combination (also called a hot-key), or by typing certain text. And you can even set a program to launch automatically whenever another program opens. ■

Send your questions to answer@pcworld.com. Answer Line pays $50 for published items. See find.pcworld.com/31577 for more Answer Line columns. Lincoln Spector is a contributing editor for PC World.

chumbo·com®
the ultimate source in technology solutions

bizrate.com customer certified
CNET ★★★ Certified Store
PC MAGAZINE EDITORS' CHOICE
Two Time Editor's Choice for "Best Online Software" Store 1998 & 1999

projectors

Chumbo.com carries all types of projectors for mobile presentation to home theatre needs. Check out our huge selection of projectors all at great prices. Have a question? Call us today!

EPSON PowerLite 730c
Multimedia Projector
2000 lumens 4.3lbs XGA
$2,947.99

EPSON PowerLite 51c
Multimedia Projector
1200 lumens 6.8lbs SVGA
$1,548.99

EPSON PowerLite 811p
Multimedia Projector
2000 lumens 9.3lbs XGA
$3,169.99

NEC Multisync LT150Z
Multimedia Projector
1000 lumens 3.3lbs XGA
$2,715.00

Infocus LP650
Multimedia Projector
2500 lumens 9.3lbs XGA

Infocus LP530
Multimedia Projector
2000 lumens 5.9lbs

Infocus X1
Multimedia Projector
1000 lumens 6.8lbs SVGA

call for our incredible Infocus deals!

Sony VPL-CS5
Ultra Compact LCD Projector
1800 lumens 5.15lbs SVGA
$1,634.99

Call our solution center today!
800-343-7530

FedEx Next Day only $8.95 Second Day only $5.95

Call for Special Government and Educational Pricing.
P.O.'s are Welcome!

scanners

EPSON GT-10000+ Scanner 600 x 2400dpi with SCSI Card; features a large 11.7" x 17" Scanning Bed	$1,182.00
Microtek ScanMaker 9800XL - 48-Bit 3200x1600dpi; amazing 3200 x 1600 dpi optical resolution, large 12" x 17" reflective scan bed	$1,172.49
Microtek ScanMaker 5900 Flatbed with Transparency Adapter - 4800x2400dpi USB 2.0	$171.99

networking

wireless

Linksys WPC51AB Dual-Band Wireless A+B PC Card Adapter (802.11a & 802.11b)	$113.49
Linksys WPC11 Wireless Network PC Card (802.11b)	$60.49
Linksys WRT51AB Dual-Band Wireless A+B Broadband Router and 4-port Switch (802.11a & 802.11b)	$256.41
Linksys BEFW11S4 EtherFast Wireless Access Point, Cable/DSL Router & 4-Port Switch	$111.99

wired

Linksys BEFVP41 EtherFast Cable/DSL VPN Router with 4-Port 10/100 Switch	$129.49
Linksys EPSX3 EtherFast 3-Port 10/100 PrintServer - Version 2	$132.99
Linksys ProConnect 2-Port KVM Switch Kit	$63.99

software

Choose from our selection of thousands of titles for both PC and MAC for home use to Enterprise Server. Chumbo is the Ultimate Source in Software™.

Apple Mac OS X 10.2 "Jaguar"	$114.99
Apple DVD Studio Pro 1.5	$904.99
Symantec AntiVirus Small Business 8 (5 users)	$239.00
Macromedia Flash MX for Windows	$473.49
JASC Paint Shop Pro 7 Anniversary Edition	$92.99

chumbo·com®
800-343-7530
221 N. 1st Street, Minneapolis, MN 55401
Phone: 612-343-7086 Fax: 612-343-7087

Call for Special Government and Educational Pricing.
P.O.'s are Welcome!

Prices are subject to daily change without notice. Shipping charges are non-refundable.

storage central

Looking for the best value in storage come visit or call Chumbo.com for DVD Writers, Tape Back-up, Hard Drives of all types and capacities. Chumbo.com specializes in storage solutions from the best names in the business…Seagate, Maxtor, WD, Sony AIT, Quantum DLT just to name a few. In addition we carry complete tape back-up management software from Veritas (Backup Exec) and Arcserv.

hard drives

internal

40GB Seagate Barracuda ATA IV ATA/100 7200RPM Internal Hard Drive	$96.99
60GB Maxtor EIDE Ultra ATA/100 7200RPM Hard Drive Kit	$108.49
80GB Western Digital 7200 RPM Ultra ATA/100 Hard Drive	$120.99
120GB Western Digital Caviar Ultra ATA 100 Hard Drive, 2MB Buffer	$181.49
180GB Western Digital Caviar WD1800BB 3.5" ATA/100 7200RPM Hard Drive	$324.99
200GB Western Digital Caviar WD2000BB 3.5" ATA/100 7200RPM Retail Hard Drive Kit	$348.49

external firewire

Maxtor 120GB Personal Storage 5000DV	$269.99

external usb

40 GB Maxtor 3000LE USB 2.0	$173.99
120 GB Maxtor 3000LE USB 2.0	$252.99

scsi internal

18.4GB Maxtor Atlas 10K III Ultra 160 4.5MS Seek 68PIN 10000 RPM	$144.99
36GB Fujitsu MAN3367MP Ultra 160 4.5MS Seek 10000 RPM 68 PIN	$238.49
36.7GB CHEETAH X15-36LP Ultra 160 3.7MS Seek 15000 RPM LVD 68PIN	$399.49
73GB Fujitsu MAN3735MP Ultra 160 4.5MS Seek 10000 RPM 68 PIN	$542.49
181.6GB Seagate Barracuda 180 Ultra 160 7.4MS Seek 7200 RPM 16MB Buffer 68 Pin	$1,415.49

tape drives

Sony 35/90-GB AIT-1 External SCSI Tape Drive 3 Year/24 Hour Swap	$961.49
Sony 130GB SDX-D500C/TB AIT-2 External Tape Drive 3 Year/24 Hour Swap	$1,389.49
Sony 100/260GB AIT-3 External Tape Drive 3 Year/24 Hour Swap	$3,289.49
Seagate TapeStor Travan 20GB ATAPI Internal Tape Drive with TapeWare Software	$251.99
HP Surestore DAT 24GB 24i DDS3 Int.SCSI-2 Tape Drive/One-Button Disaster Recovery	$789.99
Seagate TapeStor Travan 40GB ATAPI Internal with TapeWare XD	$357.49
HP Surestore DAT 40GB 40i DDS4 Int.SCSI-2 Tape Drive/One-Button Disaster Recovery	$1,183.99

sony storage ait tape libraries

1.5/3.9TB AIT3 LVD/SE 1DR/15SLOT Desktop	$6,451.99
3.0/7.8TB AIT3 LVD/SE 1DR/30SLOT Desktop	$9,599.99
525GB/1.4TB AIT1 1DRIVE/15SLOT LVD/SE Tabletop	$3,729.99

dvd & cd writers

dvd writers

NEW! Sony DRU500A DVD+RW/DVD-RW Internal EIDE Drive. The amazing new DRU-500A burns DVD-R/-RW, DVD+RW/+R, and even CD-R/CD-RW discs	$349.00
HP DVD-Writer DVD200i drive DVD+RW/+R and CD-R/RW Combo Drive Kit	$459.99
Memorex DVD+R/DVD+RW Internal IDE Drive Kit	$279.99

cd writers

Yamaha CRW-F1ZE 44x24x44 Internal EIDE CD-RW with NEW DiscT@2 Laser Labeling System	$151.49
Yamaha CRW-F1ZUX 44x24x44 External USB-2.0 CD-RW Drive with DiscT@2 Laser Label System	$218.49
TDK VeloCD 40X/12X/48X EIDE Your Price: after $40.00 mail-in rebate	$79.99

FOR ADVERTISING INFORMATION CALL TOLL FREE:
888/254-0711

Senior Vice President of Sales
Neal Mandel 212/655-5157

Southeast/Midwest
Mike Avila 212/655-5259

Northwest
Michelle Tonzi 212/655-5201

Sales Manager/Northeast/West Coast
Debra Robbins 212/655-5111

SHOP HERE

PC WORLD MARKETPLACE

INTERNET/ISPs

AIT	800/878-4084
Blue Genesis	866/258-3351
OLM	olm.net/pcworld
Timehost Network	888/598-1772

PRODUCTIVITY

Bridge Pro	bridgepro.com
Inkfarm.com	800/465-3276
inkjetsw.com	800/447-3469
Iris Pen	800/447-4744
Projector People.com	888/228-9865
Worth Data	800/345-4220

TRAINING/ENTERTAINMENT

Academic Superstore	800/580-9237
Full Sail	800/226-7625
Micro 2000	800/436-1695

SYSTEMS/PERIPHERALS

Granite Digital	510/471-6442
Orange Micro	orangemicro.com
PQI-USA	pqiusa.com

MEMORY/UPGRADES

Wilson Windowware	try.winbatch.com

SERVICES/SUPPLIES

Big Clearance	888/828-3636
BuyCheapSoftware.com	888/999-2611
Condre	866/500-3472
Drivesavers	800/440-1904
Ei Printing	800/245-5775
Max Patch Ink	888/231-3486
SonicWALL	sonicguard.com
The Laptop Desk	877/527-9675
United Imaging	800/999-0159
Universal Inkjet Refill Kit	877/4-KALVIN
Zalman	714/693-8880

CONSUMER

Tempur-Pedic	888/625-5715

AIT Inc. Hosting

Performance + Reliability + Value = **PROFIT**

Hosting Plan	Monthly Fee	Virtual Domains	Disk Space	Data Transfer
Business Class	*Managed Hosting Platform*			
Business Basic	$4.95	1	100MB	20GB
Business Plus	$18.95	1	400MB	40GB
Reseller Class	*Independently Managed Hosting & Internet Platform*			
I-MHIP Standard	$59.95	5 - 25	800MB	60GB
I-MHIP Advanced	$99.95	30 - 130	3 GB	80GB
I-MHIP Enterprise	$199.95	150 - 300	40GB	100GB

LINUX BY CHOICE   Windows 2000

Server Features:

- Flat Monthly Bill
- FREE Webmail & Chat
- FREE Private Label DNS
- FREE Rebilling Software
- FREE Domain Registration
- TOLL FREE 24/7 Tech Support
- FREE Sales & Marketing Leads
- Resell Domain Registration @ $7.99
- Resell Internet Access @ $8.99
- 99.9% Network Uptime Guaranteed
- 30 Day Money Back Guarantee
- FREE SSL & PGP Encryption
- FREE Mcart Webstore / Shopping Cart
- 93,000 Sq. Ft. Data Center
- Unlimited POP Email Accounts
- Server Management Tool / CPanel
- MySQL & MS-SQL Database Support

Additional Services:

- Communication Suite - $9.95
- Developers Suite - $7.95
- E-Commerce Suite - $3.95
- Marketing Suite - $2.95
- Dedicated & Co-lo Servers - $79/mo.
- ASP Custom & Enterprise Solutions

"Ranked 35th fastest growing private business in U.S./Inc. magazine"

HOSTING 190,000 DOMAINS

www.AIT.com/pcw
sales@AIT.com

***CALL TOLL FREE* 1.800.878.4084**

Check out our free demo at BlueGenesis.com

Web Developers' Dream!
Introducing VM Server 10!

All the tools you need to build & manage world-class websites:

- Award winning platform
- UNIX/Windows Hybrid
- 99.9% Uptime guarantee
- NO SETUP FEES!

Host up to 10 websites for $79.99 USD!

Single domain hosting available for as low as $6.99!

VM Server

Enjoy the freedom to manage your own server, and the comfort knowing that your websites are running on our award winning clustered architecture. Let us take care of the all the hardware and software while you concentrate your effort on what matters most: building websites and making more money!

Blue Genesis

For a FREE 30-DAY TRIAL:
Call TODAY! 1-866-258-3351
www.bluegenesis.com sales@bluegenesis.com

TIMEHOST.COM

Don't get tied up
with big setup fees.

$0 Down ↓

→Dedicated Servers
Up to:
1.4GHz Pentium III
512 RAM
40 GB HD

$99 per month
FREE Setup

→Virtual Hosting
25 MB Disk Space
Unlimited Traffic
1 POP Email Account

$7.95 per month

Each Dedicated Server Package includes free support & consulting, of which you may use to get advice, direction, or advanced technical tutoring of the Server itself.

Call Now (888) 598-1772

Need More Sleep?

Downtime is a nightmare for everyone. Fear of your server crashing can keep you up at night. Now you can sleep with a blanket of comfort provided by OLM's 99.9% uptime guarantee.

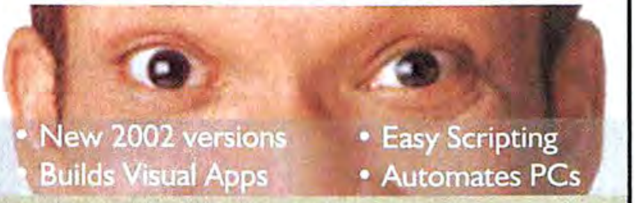
OLM provides Tier 1 networking, with multiple high speed redundant connections, and 24/7 server monitoring. Our highly trained technicians are up late at night, so you don't have to be.

Sleep tight with www.olm.net/pcworld

OLM.net
Web Hosting Solutions @ Your Service

877-2-OLM NET • info@olm.net • www.olm.net/pcworld ©2002 OLM, LLC

Web Hosting E-Commerce Server Solutions Domain Registration


Macro Miracles with WinBatch

"I had this project.
The VB guy couldn't do it in 2 weeks.
I sat down and did it in 2 hours with WinBatch."

- New 2002 versions
- Builds Visual Apps
- Easy Scripting
- Automates PCs

Download a trial copy: http://try.winbatch.com

IRISPen II

World Premiere Starts at $129.99 First USB Pen Scanner

No more retyping!

The IRISPen II retypes text, numbers, bar codes and handwritten numbers into any Windows or Mac application. What you get is real editable text, right at the cursor position!

Up to 1.000 char./sec.

Up to 100% accurate

IRIS Document to Knowledge

www.irisusa.com | 800-447-4744

Bar Code Headquarters

RF Lasers and RF CCD's

True Type and Postscript Bar Code Fonts

On-line RF Terminals

Lasers, Wands, CCDs, Slot Badge, etc.

Batch Data Collectors

For a complete catalog or to shop online, visit us at

www.barcodehq.com/w

or call 800-345-4220
or 831-458-9938

WORTH data

"If you find a projector for any cheaper, it fell off a truck."

MITSUBISHI ELECTRIC X490U
Network projector.
XGA (1024 x 768), 2600 lumens, built-in SmartHub networking system, 15.2 lbs.
Call for Today's Low Price .... ~~$3999⁰⁰~~

NEC LT260
XGA (1024 x 768), 2000 lumens, 7 lbs.
Call for Today's Low Price .... ~~$3595⁰⁰~~

InFocus LP70
XGA (1024 x 768), 1100 lumens, 2.4 lbs.
Call for Today's Low Price .... ~~$3099⁰⁰~~

*Prices at time of printing - call for latest deals!

Small Detail Okay · Travel Friendly · Room Lights On · High Contrast · HDTV Ready · Home Theater · Carry Case

ProjectorPeople.com
Call 888-228-9865
M-F 8-8 EST. or order online at
www.projectorpeople.com

EPSON SONY proxima HITACHI SHARP

Find it fast. Buy it now.

Shopping for computer products? The fastest, easiest way to get your hands on exactly what you're looking for is the **PC World Marketplace classified ads**. From memory and software to peripherals and service, it's where one-stop shopping begins.

PC WORLD Marketplace

"One Small Step for iBOT
One Giant Leap for Web Cams"

iBOT2

World's first USB 2.0 Web Cam!
Warp speed provided by USB 2.0 Technology

The iBOT2, offers the best quality, best color & the fastest speeds when compared to current USB 1.1 web cams. In fact, the new USB 2.0 technology allows the iBOT2 to run up to 10 imes faster.
Software included for video conferencing, video capture, photo editing and web streaming.

AVAILABLE AT: Circuit City
1394 FireStation.com
buy.com *and others*

Orange Micro inc.
www.orangemicro.com

HI-SPEED USB

ACADEMIC DISCOUNTS
Save Up To 80%
On Name Brand Software

FULL-VERSION ACADEMIC PRICES:

Adobe®	
Acrobat 5	Save 77%
Illustrator 10	Save 77%
Web Collection	Save 66%
Design Collection	Save 60%
Macromedia®	
Flash MX	$94
Dreamweaver MX	$94
Director 8.5	$324
Microsoft®	
FrontPage 2002	Save 53%
Office XP Pro	Save 67%
Visual Studio.Net Pro	Save 80%
Procreate®	
Painter 7	$199
KnockOut 2	$145
KPT Effects	$79

ALL MAJOR MANUFACTURERS... ALL AT HUGE DISCOUNTS!

Macromedia® STUDIO MX $189
You Save! 85%

NewTek® LightWave 3D 7.5 $395
You Save! 75%

Adobe® PHOTOSHOP 7 Call!
You Save! 52%

FREE UPS® GROUND SHIPPING
When you order online at:
PW.AcademicSuperstore.com

CALL US TODAY!
1-800-580-9237

ACADEMIC SUPERSTORE

Micro2000

The ULTIMATE A+ Certification Bundle

Micro 2000's A+ Certification Bundle contains the two most powerful tools you could have in your arsenal:

Micro 2000's all new A+ Certification Course - which contains extensive training guides, 3 hours of instructional video, and 7 hours of realistic simulations. Also included is Challenge Interactive, the interactive test simulator from Wave Technologies, which contains over 700 sample test questions to make sure you're ready to pass and get your certificate.

SPECIAL OFFER $349.00

Micro-Scope 11 - recognized by technicians everywhere. Micro-Scope is operating system independent and communicates directly with the PC's hardware with results far more accurate than DOS or Windows based diagnostics. The **new version 11** includes a **Secure Wipe** feature for erasing sensitive hard drive information. The new version also includes a new **mouse driven interface** and **USB 2.0 testing and support**. Includes excellent FREE phone support. Our technicians can walk you through any technical situation, whether you're in your office or on-site.

WWW.MICRO2000.COM

Call Today:
1-800-436-1695

Vazhar
by Full Sail Graduate
Brian Germain

FULL SAIL.
Real World Education

CAREER TRAINING IN:

- Game Design
- Computer Animation
- Digital Media

Job placement assistance.
Accredited college, ACCSCT.
Financial aid available to those who qualify.

800.226.7625
www.fullsail.com

3300 University Blvd. • Winter Park, FL 32792

© 2002 Full Sail, Inc. All rights reserved. The terms Full Sail, Full Sail Real World Education, and the Full Sail logo are either registered service marks or service marks of Full Sail, Inc.

S.M.A.R.T. FireWire 1394 Hot-Swap - ULTRA 320 SCSI

S.M.A.R.T. FireWire Case Kits $199

LCD Display
patent pending
3.5"

S.M.A.R.T. (Self Monitoring Analysis and Reporting Technology) adds reliability. Now you can monitor performance, predict possible data loss, and know everything you ever wanted about your drive. It's like having a technician built into every case. Small lightweight, compact size (6x8x11/4) make this the best there is.

FireVue™ FireWire Case Kits

$139

Simply add your IDE drive to our case and you have an instant FireWire Drive.Two models, 3.5" and 5.25".Supports Hard Drives, CD-Roms, tape,and a variety of other devices.

- •50 Watt Power Supply
- •40MB/s Fast FireWire
- •1 Year Warranty

Gold VHD Ultra320 SCSI Cable

Features:
- New .8mm Ultra 320 SCSI Connecto
- Triple Shielding (Unique Design)
- Double Gold 20u" Plated Connectors
- Diagnostic Indicators • Large Ferrite Filters

From: $109

SCSIVue™ Active Terminator

Ultra-320 LVD
68MD
Optional Remote Display

From: $39

Seven models available with optional Remote LED Pak. These are the finest terminators available, they fix SCSI problems and improve reliability.

Online Catalog at... www.scsipro.com

FIREWIRE PRODUCTS

Our FireWire Hot-Swap Systems will transfer data at speeds up to 100MB/s!!! RAID or JBOD

FireVue™

Additional TRAYS $29.95

Rack Mount holds 8 drives

From: $399

Uses inexpensive IDE Drives

Our Hot-Swappable RAID / JBOD (just a bunch of drives) Systems offer quick and easy bay interchangability and complete fault tolerance. Each Hot-Swap Bay includes 2 fans and our exclusive Blue Neon Light. Systems can be custom configured to your specific needs. Our RAID Systems use standard IDE ATA100 Drives offering low cost and high reliability.

ULTRA 320 SCSI PRODUCTS

SCSIVue™ Ultra 320 SCSI Cases

2 Bay Tower
4 Bay Tower
8 Bay Tower

From: $99

SCSIVue™ SCSI RAID Enclosures

Ultra 320 SCSI Towers 14 & 28 Bay

From: $999

Granite Products Are The Best Because They're Engineered Right.

S.M.A.R.T. FireWire Hot-Swaps $299

Complete, Includes one Tray

S.M.A.R.T. Technology for reliability and Hot-Swap for affordable, easy removability. This is the ultimate storage system on the market. It is the idea solution for large backups, DV, AV, and other large storage needs. Your data is safe in our SMART Hot-Swap System.

FireVue™ FireWire Hot-Swaps

$229

Perfect Backup Solution

FireWire Hot-Swap Case Kits offer low cost transportable data storage. You simply buy the Kit and as many extra Trays to hold all the storage you need. Perfect for DV and AV jobs, just dedicate a drive and tray for every job. With the low cost of IDE storage this system is one of the most cost effective "on-line" storage systems available.

Hot-Swap w/ 60 Gig IBM $379

Hot-Swap w/ 120 Gig IBM $509

Above systems include, everything needed to plug and play on any Mac or Windows 98SE, ME, 2000, XP platform.

FREE Technical Support!!!

Available to everyone, customer or not.

Granite "The Solution Company" Granite D•I•G•I•T•A•L **3101 Whipple Rd. Union City, CA. 94587 Ph: 510-471-6442 Fax 510-471-6267**

The secret is unseen.

Because our miracle is on the inside...

Tempur-Pedic's advanced sleep technology is recognized by NASA, raved about by the media, extolled by more than 25,000 medical professionals worldwide.

Yet this miracle must be *felt* to be believed.

While the thick, ornate pads that cover most mattresses are necessary to keep the hard steel springs inside, they create a hammock effect outside—and can actually *cause* pressure points. Inside our bed, billions of microporoscopic memory cells function as molecular springs that contour precisely to your every curve and angle.

Tempur-Pedic's Swedish scientists used NASA's early anti-G-force research to invent new kind of viscoelastic bedding—TEMPUR pressure-relieving material—that *reacts* to body mass and temperature. It *automatically adjusts* to your exact shape and weight. And it's the reason why millions of Americans are falling in love with the first *really* new bed in 75 years: our high-tech Weightless Sleep technology.

It never needs to be turned, rotated, or flipped. And, unlike other mattresses, Tempur-Pedic's Swedish Sleep System® transmits virtually no body motion between sleep partners.

Small wonder, then, that 3 out of 4 Tempur-Pedic owners go out of their way to recommend our revolutionary bed to close friends and relatives. And 82% tell us it's the *best bed* they've ever had!

Please return the coupon at right, without the least obligation, for a FREE DEMONSTRATION KIT. Better yet, phone or send us a fax.

FREE SAMPLE of TEMPUR® pressure-relieving material™ the molecular heart of Tempur-Pedic's legendary Weightless Sleep™ bed, is yours for the asking. You also get a free video and Free Home Tryout Certificate.

Recognized by NASA

SPACE

Certified by the Space Foundation

For free demonstration kit, call toll-free

1-888-625-5715

or fax to: 1-859-514-4423

Name

Address

City/State/Zip

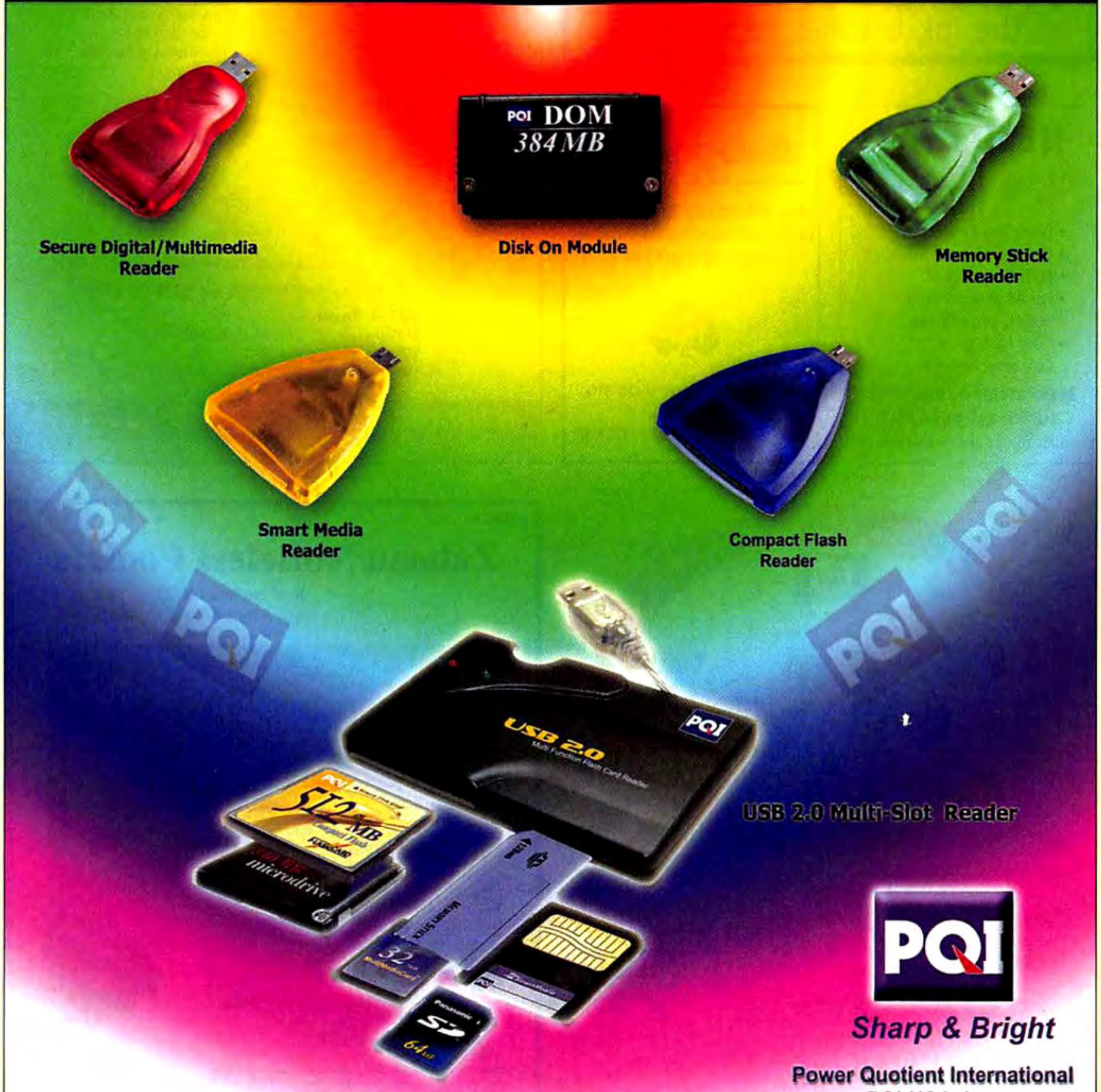
Phone (optional)

TEMPUR-PEDIC®
PRESSURE RELIEVING
SWEDISH MATTRESSES AND PILLOWS

Tempur-Pedic, Inc. 1713 Jaggie Fox Way, Lexington, KY 40511

© Copyright 2002 by Tempur-Pedic, Inc. All Rights Reserved

Our "Power Quotient" is the highest amongst any others, as PQI only manufactures Flash Media Storage products with absolute POWER.


Secure Digital/Multimedia Reader
PQI DOM 384MB
Disk On Module
Memory Stick Reader
Smart Media Reader
Compact Flash Reader
PQI
USB 2.0 Multi Function Flash Card Reader
USB 2.0 Multi-Slot Reader
512MB
microdrive
32MB
64MB
PQI
Sharp & Bright

Power Quotient International
PQI-USA, Inc.
www.pqiusa.com

Come visit PQI-USA,Inc at CES, Las Vegas from Jan 9-13, 2003.
Booth Number: 35173.

Copyright (C) 2002 PQI-USA, Inc. All rights reserved.

ink & toner

- $3.50 shipping! • $2 off: enter promo code "PCW53"
- All brands: Alps, Oki, Lexmark, HP, Brother, more!

Hewlett-Packard			Canon			Epson		
51645A	New HP	24.61	BCI-3bk	Orig Canon	13.79	S020189	Orig. Epson	23.99
	Refilled cart	17.91		Inkfarm bnd	6.85		Inkfarm brand	9.99
C6578A	New HP	52.91	BCI-3c/y/m	Orig Canon	11.98	S020093	Orig. Epson	18.95
	Refilled cart	27.91		Inkfarm bnd	6.85		Inkfarm brand	8.99
C6578D	New HP	31.91	BCI-21c	Orig Canon	16.99	S020187	Orig. Epson	21.64
C1823D	New HP	29.99		Inkfarm bnd	10.75		Inkfarm brand	10.75
	Refilled cart	22.99						

1-800-INKFARM

inkfarm.com

the ink & toner supersite.™

AIT Tape Storage Systems from CONDRE

AIT 8-Pak (800 GB)
- (8) cartridge desktop or rackmount autoloader
- Low price point for mid range applications
- Available in 16 cartridge configuration

AIT-1 Tape
- External plug and play AIT-1, 2, 3 subsystem
- Direct USB 2.0 connectivity
- 35 GB native capacity / 90 GB compressed

www.condre.com • 1-866-500-3472

NEED INK?

Max Patch Ink

- Don't Pay Retail!
- Discount Printer Supplies
- Fully Guaranteed
- For all your printing needs, you will get...
- "Old Fashioned" Customer Service

MaxPatchInk.com/?PCW
1-888-231-3426 PST
*mention this ad and receive 10% off!!

BridgePro™

An affordable, reliable, realistic contract rubber bridge game

Free download demo at:
www.bridgepro.com

HP BLOWOUT SALE
hp invent
unitedimaging.com/ad
code: PCW1014
UNITED IMAGING
Office Solutions Source
SAVE
SAVE
Call 800-999-0159

ZALMAN

Zalman Noiseless Coolers

Intel Pentium 4 (478)
AMD Athlon XP (462) **Silent**

CNPS6000-Cu
CNPS5700D

- Zalman CPU Coolers generate little noise and vibration in Silent Mode.
- The heat dissipating material of the Flower HeatSink (FHS) is 100% Pure Aluminum or Copper.
- CPU can be cooled sufficiently below the temperature required by the CPU manufacturer in Silent Mode.
- Zalman CPU Coolers allow very stable operation of CPUs in an OVERCLOCKED environment.

CPU Coolers **Other Products**

Zalman Tech Co., Ltd. (www.zalman.co.kr)
Tel : 82-2-2107-3232 Seoul, Korea

Zalman USA, Inc. (www.zalmanusa.com)
Tel: 714-693-8880 1565 Harmony Circle, Anaheim, CA 92807

Shopping for computer products?

The fastest, easiest way to get your hands on exactly what you're looking for is the **PC World Marketplace classified ads.** From memory and software to peripherals and service, it's where one-stop shopping begins.

PC WORLD Marketplace

Quickbooks® Checks & Forms.

Covered by our "Rock Bottom" Pricing Guarantee!

Quickbooks Compatible Checks, Forms and Deposit Slips to cover all your business needs.

call:800.245.5775
fax: 800.893.0177
info@checksforless.com

New catalog available, featuring: laser checks • software forms • stationery deposit slips • security deposit bags

The Excellence in Printing Company

www.checksforless.com **EiPrinting**

DATA RECOVERY: 800-440-1904

7 good reasons to choose DriveSavers:

"We Can Save It!"

- Fastest, most successful data recovery service available.
- Recommended and certified by **all** drive companies to maintain your warranty.
- Advanced, proprietary recovery techniques.
- 24-hour, onsite, and weekend services.
- Retrieve recovered data instantly, over secured Internet lines with DATAEXPRESS™.
- Featured on CNN, BBC, Forbes; also in PCWorld, InfoWorld, MacWorld, Popular Mechanics, and many others.
- Federal and State Contracts.

DRIVESAVERS DATA RECOVERY

"Restoring Data and Peace of Mind Since 1985"

Visit DriveSavers at www.drivesavers.com
©2002 DRIVESAVERS, INC. 400 BEL MARIN KEYS BLVD., NOVATO, CA 94949 INTL: 415-382-2000

Save up to 90% on Inkjet Inks for
HP Canon Epson Lexmark Apple Compaq Xerox

Inkjet Cartridges
Refill Kits
Laser Cartridges
Thermal Fax Rolls
Copier Supplies

Compatibles:

Epson 880 black	$9.95
Epson 880 color	$13.95
Canon S520 black	$7.95
Canon E31 / E40	$86.00

Qty Discounts Available

Cartridge specific **refill inks NOT inferior Universal Inks**

INKJet SOUTHWEST inkjetsw.com

Printing supplies for Home and Business
Enter our $50 monthly online drawing

> www.inkjetsw.com <
1-800-447-3469

Notebook Users, STOP the INSANITY!!

- Prevent Overheating Problems
- Improve Ergonomic Typing Angles
- Eliminate the Hot & Slippery Lap

THE LAPTOP DESK ™

The world's most versatile (and logical) notebook platform

only $29.95

www.laptopdesk.net | 877-527-9675

Big Deal Windows XP From $95

Current Software. BIG CLEARANCE.COM **Clearance Prices.**

Buyers, Sellers & Dealers Welcome

Adobe Top Products	
Illustrator V10.0	from $309
PageMaker	from $83
FrameMaker	from $209
InDesign	from $149
GoLive	from $99
LiveMotion	from $129
AfterEffects	from $149
Premiere	from $179
Borland Top Products	
Borland C++	from $379
Borland Delphi	from $389
Boland JBuilder	from $390
Corel Top Products	
CorelDRAW	from $54
WordPerfect Std	from $42
WordPerfect Pro	from $55
Intuit Top Products	
Quicken Deluxe	from $26
Quicken Suite	from $32
Quickbooks	from $119
Microsoft Office Products	
Office XP	from $195
Office 2000	from $149
Office 97	from $129
Word 2000/XP	from $49
Project	from $179
Microsoft Windows	
Windows XP	from $95
Windows 2000 Pro	from $139
Windows NT Workstation	from $79
Windows Me	from $97
Windows 98.2	from $102
Windows 95	from $49
Microsoft Servers	
Windows 2000 Server	from $695
NT Server	from $395
ISA Server	from $1399
SQL/Exchange Server	from $999
Visual Basic	from $105
Visual Studio	from $479
BackOffice Server	from $1499
BackOffice SBS	from $849
Symantec	
Norton AntiVirus	from $15
Internet Security	from $19
ACT	from $46
PC Anywhere	from $37
WinFax Pro	from $47
SystemWorks Pro	from $27
McAfee	
VirusScan	from $12
Utilities Deluxe	from $15
Office 2000	from $12
Total Virus Defense	from $289

Super Big Deal ACT! 2000 $46

And that's not all! Call now or visit our website for current pricing on our full-line of products.

FREE SHIPPING!
www.bigclearance.com 888-828-3636

SonicGuard.com

SonicWALL appliances provide a complete Internet Security Solution for any network regardless of size.

FIREWALLS • VPN • ANTI-VIRUS • CONTENT FILTERING • AUTHENTICATION • VULNERABILITY SCANNING • SSL • GLOBAL SECURITY MANAGEMENT

SONICWALL
SSL-R1

SONICWALL

UNIVERSAL™

INKJET REFILL KIT

ARCHIVAL, UV RESISTANT ON REGULAR PAPER & WATER PROOF ON COLORFAST PAPER

Original Equipment Manufacturer Ink & Paper
Universal Inkjet ColorFast Long Life Ink & Paper
Printed with Original Equipment Manufacturer Inkjet Ink & Paper
Printed with Universal ColorFast Inkjet Ink & Paper

RETAIL SAVINGS OVER $300.00

Refill your Inkjet Cartridges

GREAT FOR DIGITAL PHOTOGRAPHY

As low as $3.00 per refill

www.colorfastink.com

©2002 CBW, Inc., Chatsworth, CA. 91311 1-877-4-KALVIN

BuyCheapSoftware.com

A Softman Products Company

888.999.2611

VISA MasterCard DISCOVER

Phone: (310) 305-3644 • FAX: (310) 305-3645
e•mail: sales@buycheapsoftware.com

Microsoft

All Microsoft OEM software includes hardware

Word XP 2002 w/Free Encarta '02 Full oem Version	$71
Office XP Pro Upgrade Retail Box	$279
Office XP Pro Full Version Retail Box	$395
Office XP Standard Upgrade Retail Box	$219
Office XP Standard Full Version Retail Box	$345
Office XP Small Bus. Full oem Version, CD/COA	$186
Office XP Professional Full oem Ver., CD/COA	$337
Office 2000 Pro Full OEM Version, CD/COA	$345
Office 2000 Small Bus. Full OEM Ver., CD/COA	$209
Office XP Developer Ed. Full Retail Box	$539
Office Pro 95 Full oem, CD/COA/Manual	$99
Project 2002 Standard Full Version Retail Box	$439
Project 2002 Pro Full Version Retail Box	$795
Project 2002 Server Full Retail Box, 5-user	$999
Visual Studio.net 2002 Pro Full Retail Box	$519
Visual Studio.net 2002 Dev. Ent. Full Retail Box	$849
Visual Studio.net Arch. Ent. 2002 Full Retail Box	$1039
Visual Studio Pro 6.0 Full Ver. Retail Box	$579
Visual Studio Enterprise 6.0 Full Ver. Retail Box	$895

Microsoft Windows

Windows XP Home Edition Full oem Version	$95
Windows XP Home Ed. Full Version Retail	$188
Windows XP Pro Edition Full oem Version	$148
Windows XP Pro Edition Up-Grade Retail	$198
Windows XP Pro Edition Full Retail Ver.	$239
Windows 2000 Pro SP2 Full OEM Version	$154
Windows Millennium Full OEM Version	$89
Windows 98.2 CD/COA/Manual Full OEM Version	$102
Windows 98.2 Plus CD/COA/Manual Full OEM Ver.	$124
Windows 98.2 Full Version Retail Box	$159
Windows 95 OSR 2.5 w/CD-Manual-License OEM	$40
DOS 6.22 w/CD-Manual-License Full OEM Version	$49
Windows 3.11 & DOS 6.22 w/CD-Man.-Lic. Full OEM	$69

Windows Server & BackOffice 2000

WINDOWS 2000 Server Full oem w/5-CAL	$639
WINDOWS 2000 Server Full Retail Box w/5-CAL	$727
WINDOWS 2000 Server Full Retail Box w/10-CAL	$825
WINDOWS 2000 Server Full Retail Box w/25-CAL	$1018
WINDOWS 2000 Advanced Server Full Ver. w/25-CAL	$1095
WINDOWS 2000 Server 20-Client Access License only	$375
WINDOWS 2000 Terminal Server 20-Client Access Lic. only	$1575
NT Server 4.0 CD Full oem Version w/5-CAL	$389
NT Server 4.0 CD Full oem Version w/10-CAL	$409
BackOffice 2000 Small Bus. Serv. 5-CAL, Full oem Version	$842
BackOffice 2000 Small Bus. 5-CAL, Full Version Retail Box	$1089
BackOffice Server 2000 Full Retail w/5-CAL	$1899
BackOffice Server 4.5 w/5-CAL, Full Retail Box	$1059

MS Server Family Products

SQL 2000 w/5-CAL, Full Ver/Retail Box	$1077
SQL 2000 w/10-CAL, Full Ver/Retail Box	$1799
SQL 2000 Standard One Proc., Unlimited	$3795
SQL 2000 Enterprise Ed. Full 25-CAL, Full Retail Box	$2199
SQL 2000 Enterprise Ed. One Processor, Unlimited CAL	$6199
SQL 7.0 Standard w/5-CAL, Full Retail Box	$1099
SQL 7.0 Standard w/10-CAL, Full Retail Box	$1195
SQL 7.0 Standard 20 Client Access License only	$695
Exchange 2000 w/5-CAL Full Retail Box	$939
Exchange 2000 Enterprise Ed. w/25-CAL Full Retail	$1705

Corel WordPerfect/Draw

All Corel OEM software includes hardware

Wordperfect Office 2002 Pro Full oem CD only	$48
Wordperfect Office 2002 Pro & Dragon Nat. Sp. Full CD	$58
Wordperfect Office 2002 Standard Full Retail Version	$289
Wordperfect Office 2002 Pro Full Retail Version	$369
Wordperfect Office Std. 2000 Full oem CD only	$34
CorelDraw 11.0 Graphics Suite Full Retail Version	$429
CorelDraw 10.0 Graphics Suite Full Retail Version	$369

Adobe

Acrobat 5.0 CD Full Retail Version - WINDOWS	$225
Acrobat 5.0 CD Full Retail Version - MACINTOSH	$200
Photoshop Elements 2.0 Full Retail Version - WINDOWS	$84
Photoshop 7.0 Full Retail Version - WINDOWS	$495
Photoshop 7.0 Full Retail Version - MACINTOSH	$505
Pagemaker 7.0 Full Retail Version - WINDOWS	$309
Illustrator 10.0 Full Retail Version - WINDOWS	$205
Illustrator 10.0 Full Retail Version - MACINTOSH	$249
InDesign 2.0 Full Retail Version - WINDOWS	$459
InDesign 2.0 Full Retail Version - MACINTOSH	$379
Premier 6.0 Full Retail Version - WINDOWS	$309

Symantec

Norton Anti-Virus 2003 Full CD Version	$15
Norton Anti-Virus 2003 Full Retail Version	$41
Norton Anti-Virus 2002 Full CD Version	$16
Personal Firewall 2003 Full Retail Box	$39
Norton Internet Security 2002 Full Retail Box	$39
Norton Internet Security 2001 Full Retail Box	$19
Norton System Works 2003 Full Retail Box	$79
Norton System Works 2003 Pro Retail Box	$85
ACT 2000 CD only, Full Version, e-manual	$32
ACT 2000 CD & Manual Full Version	$52
PC Anywhere32 10.5 Full Ver. Host & Remote w/CD only	$35
PC Anywhere32 10.5 Full Ver. Host & Remote w/CD & Manual	$79
PC Anywhere32 10.5 Full Ver. Host & Remote 10-user	$729
PC Anywhere32 10.0 Full Retail Box	$54
Winfax Pro 10.02 Full Version, Retail Box	$72

SAME DAY SHIPPING
100% SATISFACTION GUARANTEED
Excellent Service Since 1997

13470 Washington Blvd. • Marina del Rey, California 90292

Prices subject to change without notice • All trademarks are property of their respective owners • Call for pricing on products not listed.

Corporate POs & CODs WELCOME

PC WORLD

PRESIDENT, CEO Jeff Edman
EXECUTIVE ASSISTANT Patricia Owen

PHONE:
415/243-0500

FAX:
415/442-1891

E-MAIL:
letters@pcworld.com

WORLD WIDE WEB:
www.pcworld.com

MAIL:
PC World
501 Second St. #600
San Francisco, CA
94107

ADVERTISING SALES

PUBLISHER
Bob Ostrow (508/370-0844)

ASSOCIATE PUBLISHER
Wayne Silverman
(201/587-7318)

SALES ASSOCIATE Lisa Iozzia-Lyubimov (201/587-7358)

EAST

EASTERN ADVERTISING DIRECTOR

New York City/Long Island/New England
Thalia M. Karakitsios
(646/215-9395)

Mid-Atlantic/New York State/New Jersey/Southeast
Judy Sutter, Senior Account Manager (404/845-2884)

Midwest/Eastern Canada
Kathy McKay, Senior Account Manager (847/759-2723)

SALES ASSOCIATE
Tammy O'Sullivan
(847/759-2722)

WEST

WESTERN ADVERTISING DIRECTOR

Orange County/San Diego/Washington
Susan Green (949/442-4021)

San Francisco/Los Angeles/Western U.S./Western Canada
Robin Kofsky, Senior Account Manager (949/442-4024)

SALES ASSOCIATE Sheila Morales
(949/442-4014)

Silicon Valley/Oregon
Alicia Langer, Senior Account Manager (415/267-4578)

SALES ASSOCIATE
Vanessa Grenfell
(415/978-3317)

Duane Hampson, Senior Sales Development Manager
(415/978-3133)

Texas
Wayne Silverman, Associate Publisher (201/587-7318)

CUSTOM PUBLISHING/EVENTS

ASSOCIATE PUBLISHER, MARKET DEVELOPMENT Michael Carroll
(508/370-0842)

SALES ASSOCIATE
Angela Beaudoin
(508/370-0841)

PC WORLD MARKETPLACE/PC WORLD ACTION CARDS

Neal Mandel (212/655-5157)

PC WORLD REPRINTS

Joan Culp
(717/399-1900 x135)

PCWORLD.COM AD SALES

ASSOCIATE PUBLISHER
Michael Carroll (508/370-0842)

Northwest
Melissa Gruber, Regional Manager (415/974-7373)

Southwest
Cindy Crow, Account Manager
(949/442-4005)

East
Sean Murphy, Account Manager
(212/399-3155)

MARKETING & RESEARCH

DIRECTOR OF MARKETING AND RESEARCH Sandy Wong

MARKETING COMMUNICATIONS SPECIALIST Heidi Tanakatsubo

SENIOR RESEARCH ANALYST
Lisa Huck

CONSUMER MARKETING

VICE PRESIDENT, CONSUMER MARKETING Shawne Burke Pecar

ASSOCIATE CIRCULATION DIRECTOR
David Cobb

SINGLE COPY SALES DIRECTOR
Holly Drawbaugh

SENIOR MANAGER, RETENTION MARKETING Lisa Radler

SENIOR SUBSCRIPTION MARKETING MANAGER Rafael Sosa

SUBSCRIPTION MARKETING MANAGER Linda Trinh

DIRECT MAIL MARKETING MANAGER
Simon Thaler

ASSISTANT MANAGER, RETENTION MARKETING Patrick McConnell, Melissa Richards

PRODUCTION

DIRECTOR, PRINT AND ONLINE PRODUCTION Nancy Jonathans

ASSISTANT PRODUCTION MANAGER
Lisa S. Mireles

ADVERTISING TRAFFIC MANAGER
Yvette B. Joplin

AD TRAFFIC COORDINATOR
Rob Octavio

PCWORLD.COM STAFF

GENERAL MANAGER
Ulla McGee

MARKETING PROJECTS MANAGER
R. Bruce McCurdy

CUSTOMER SERVICE SPECIALIST
Michael E. England

DIRECTOR, SOFTWARE ENGINEERING
Newton Bailey

LEAD SOFTWARE ENGINEER
Jim Hutson

SENIOR APPLICATIONS DEVELOPERS
Arturo Flores, Blossom Woo, Kayan Wong

TECHNOLOGY TRANSFER PROGRAM MANAGER Wei Ming Xu

EDITORIAL APPLICATIONS DEVELOPMENT MANAGER
Matthew Newton

ADMINISTRATION

HUMAN RESOURCES AND TECHNOLOGY

SENIOR VICE PRESIDENT
Richard Willoughby

DIRECTOR Katherine Coldwell

SENIOR HR REPRESENTATIVE
Julie McKie

DIRECTOR TECHNOLOGY & INFRASTRUCTURE Mary Zones

DIRECTOR, INFORMATION SYSTEMS
Norman Noble

SENIOR NETWORK ANALYST
Walter Clegg

CLIENT SERVICES MANAGER
Mariaelena Robles Quale

NETWORK MANAGER
Rodney Barnes

IT DEVELOPER/ANALYST
Stan Erhart

INFORMATION SYSTEMS SPECIALISTS
Eileen Chaney, Gabe Ramos

SENIOR SYSTEMS ADMINISTRATOR
Geoff Sturm

SYSTEMS ADMINISTRATOR
Justin Hunter

FINANCE

SENIOR VP, COO/CFO Vicki Peilen

DIRECTOR, FINANCE
Diane Ryczek-Rae

DIRECTOR, ACCOUNTING
Michelle Reyes

BUSINESS MANAGER Thomas Pena

ACCOUNTING ADMINISTRATION
Judith Bratton, Jason Villeneuve

DIRECTOR, ADVERTISING ACCOUNT SERVICES Kevin Greene

MANAGER, FINANCIAL ADVERTISING SERVICES Diane Hacker

PC World is a business unit of International Data Group (IDG). Headquartered in Boston, IDG is the world's leading technology media, research and event company, with annual revenues of $3.01 billion. IDG publishes more than 300 newspapers and magazines in 85 countries, led by the *Computerworld/InfoWorld, Macworld, Network World, PC World,* and *Channel World* global product lines. IDG offers online users the largest network of technology-specific sites around the world, with 330 Web sites in 80 countries. IDG is also a leading producer of 168 computer-related expositions in 35 countries, and research arm International Data Corporation (IDC) provides computer industry research and analysis through offices in 43 countries worldwide. Company information is available at www.idg.com.

THE COMPANY: IDG is the world's leading technology media, research and event company. Founded in 1964, IDG had 2001 revenues of $3.01 billion and has more than 12,000 employees worldwide. IDG offers the widest range of media options which reach more than 120 million technology buyers in 85 countries representing 95 percent of worldwide IT spending. IDG's diverse product and services portfolio spans six key areas including: print publishing, online publishing, events and conferences, market research, education and training, and global marketing solutions.

PUBLICATIONS: More than 100 million people read one or more of IDG's 300 magazines and newspapers in 85 countries each month. IDG's five global publication product lines–*Computerworld/InfoWorld, CIO, Macworld, Network World,* and *PC World*–account for more than 175 of these titles, delivering a consistent audience of buyers throughout the world.

ONLINE: IDG's online network includes 330 Web sites in 80 countries, reaching more technology buyers with the broadest network of technology content online. Supported by more than 2000 journalists, IDG's Web sites provide focused, useful content that meets the needs of distinct communities around the world. Diverse advertising opportunities are available to advertisers on IDG's global ad network that offer enhanced web marketing programs including custom webcasts, e-mail newsletters and micronetworks. IDG's online network is also supported by the world's only 24-hour global technology news organization, the IDG News Service, reporting the latest technology news and analysis in multiple languages around the world.

RESEARCH: International Data Corporation (IDC) is the world's leading provider of global marketing intelligence. With research centers in 43 countries and more than 575 research analysts worldwide, IDC is uniquely positioned to provide a global perspective on IT market and technology trends, serving more than 3,900 clients worldwide. IDC is the leading provider of worldwide market research in consumer computing, including personal computing, interactive entertainment, and online services.

EVENTS: IDG is the leading producer of more than 168 globally branded conferences and events in 35 countries. Industry leading international events include LinuxWorld Conference & Expo, Macworld Conference & Expo, and BioITWorld Conference & Expo. Leading conferences include Agenda and Demo, in addition to hosting and creating customized online events and webcasts on ITworld.com. IDG produces 17 conferences and events in China alone, and was first to offer expos in emerging markets throughout Asia, Eastern Europe and Latin America.

GLOBAL SOLUTIONS: IDG Global Solutions helps the industry's leading IT companies build international brand recognition by developing globally integrated marketing programs via IDG's print, online and event products worldwide. IDG's diverse portfolio of global partnership services includes customized research, customized publishing, targeted conferences and seminars, and direct response tools.

Further information about the company can be found at www.idg.com.

INDEX

WWW.PCWORLD.COM

Advertiser	URL	Page number
ABS Computer Technologies, Inc	www.abspc.com	159
Acer America	www.acer.com/us	91
Adobe Systems Incorporated/ Intel Corporation	www.adobe.com www.intel.com	14-15
AIPCS Systems Technologies, Inc.	www.aipcs.com	89
Alienware	alienware.com	181
AMD	www.amd.com	60-61,63
Antec Inc.	www.antec-inc.com	165
Anthro Corporation	www.anthro.com	53
APC	http://promo.apcc.com	79
ATI	www.ati.com	58
Benq Incorporated	www.BenQ.com	29
Best Buy	bestbuy.com	6
Brother International	www.brother.com	115D
Canon USA	www.canonprojectors.com	127
CDW Computer Centers, Inc.	www.cdw.com	10-12
CES 2003	www.cesweb.org	52
Chumbo.com	chumbo.com	169
Circuit City Stores, Inc.	www.circuitcity.com	31
Computer Associates Int'l	www.computerassociates.com	81
Crucial Technology	www.crucial.com	16-17
CTX	www.ctxintl.com	35
Dell Computer Corp.	www.dell.com	37
Dell Computer Corp.	www.dell.com	111
Dell Computer Corp.	www.dell4me.com	120-121
Dell Computer Corp.	www.dell.com	C5-C8
Epson America, Inc.	www.epson.com	32-33
Executive Software	www.diskeeper.com	101
Freeway Technology Inc.	Freewaytech.com	39
Fujitsu PC Corporation	www.fujitsupc.com	20-21
Gateway	gateway.com	C2-1
Gyration	www.gyration.com	41
Hewlett Packard	www.hp.com	43-50
Hewlett Packard	www.hp.com/solutions/pcworld	56-57
Hewlett Packard	www.hpshopping.com/pcworld2	84-85
Hewlett Packard	www.hpshopping.com/pcworld	130-131
Hostway	www.hostway.com	132
IBM Direct	ibm.com/smallbusiness7055	68-73
IBM Direct	ibm.com/smallbusiness7055	137
IOGEAR Inc.	www.iogear.com	122
Kerio Technologies Inc.	www.kerio.com	88
Kingston Technology	www.kingston.com	153
Linksys	www.linksys.com	161
Memorex	www.memorex.com	54
Microsoft Corporation	www.microsoft.com	4-5
Microsoft Corporation	www.microsoft.com	19
Microsoft Corporation	www.microsoft.com	119
MINOLTA-QMS	www.minolta-qms.com	64
NEC-Mitsubishi Electronics Display of America, Inc.	necmitsubishi.com	87
Netopia	www.netopia.com	86
Netscape	www.netscape.com	167
PC America	www.pcamerica.com	155
PC Power & Cooling Systems	www.pcpowercooling.com	103
Pioneer Business Solutions Division	www.pioneerelectronics.com	117
Pioneer Electronics	www.pioneerelectronics.com	115
PowerQuest	www.powerquest.com	77
Raxco Software	www.raxco.com	83
Ricoh Corporation	www.ricoh-usa.com	22
R-Tools Technology	www.r-studio.com	82
Samsung Electronics America Inc.	www.samsungusa.com	8
Sony Electronics	www.sony.com	24-25
Sony Electronics	www.sony.com/displays/b2b	66
SuSE	www.suse.com	90
Sys International, Inc.	http://www.sys.com	2-3
TDK Electronics	www.tdk.com	105
Toshiba America	www.toshiba.com	113
Viewsonic	www.ViewSonic.com	99
Yahoo!, Inc.	www.yahoo.com	38
ZT Group	www.ztgroup.com	146

ALIENWARE®

Introducing Navigator Powered By Microsoft® Windows® XP Media Center Edition

Control Live Television

Use Navigator to watch TV and you won't miss a second of your favorite programs. Navigator comes with a remote control that lets you record, rewind, fast-forward, and pause live television regardless of what signal you have: satellite, cable, or antenna.

Burn Music, Photos, and Videos

Ensure that your favorite music, photos, TV episodes, and videos last forever by archiving them to CD or DVD. You can then create your own personal library, or share them with family and friends.

Enjoy DVDs

Navigator lets you watch DVDs from anywhere in the room, whether you're at your desk or on your living room couch. With advanced viewing features, you can sit back, relax, and enjoy a rich, full-screen experience in 5.1 surround sound.

View Your Favorite Photos

No matter what digital camera you have, Navigator will allow you to view digital photos one at a time or create an automated slide show. You can even personalize your photos by adding dates, titles, and background music.

Listen to Digital Music

Shuffle and play music from anywhere in the room. Play MP3s from the Internet, music CDs or music from your hard drive. Quickly locate your favorite albums, artists, songs, or play lists with an easy-to-use search function.

Edit Digital Video

Import and edit digital video files to create your own movies. Keep them organized in a digital library for easy archive and retrieval.

Alienware® recommends Microsoft® Windows® XP.

NAVIGATOR
MEDIACENTER

Intel® Pentium® 4 Processor at 2.53GHz
533FSB and 512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Intel® 845GE Chipset Motherboard
512MB PC-2700 DDR SDRAM
80GB 7200RPM Ultra ATA100 Hard Drive
NVIDIA® GeForce4™ Ti 4200 64MB DDR
5.1 Surround Sound with Optical Digital Output
PlexCombo 20X/10X/40X-12X CD-RW/DVD-ROM
Black Navigator Case with 200-Watt PS
Four USB 2.0 Ports and Three IEEE 1394 Ports
10/100 Integrated Ethernet Controller
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
Navigator Remote Control with Infrared Blaster
Navigator TV Tuner PCI Card
Microsoft® Windows® XP Media Center Edition
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$1,699.00

NAVIGATORPRO
MEDIACENTER

Intel® Pentium® 4 Processor at 2.66GHz
533FSB and 512KB Advanced Transfer Cache
High-Performance Heatsink/Cooling System
Intel® 845GE Chipset Motherboard
512MB PC-2700 DDR SDRAM
120GB 7200RPM Ultra ATA100 Hard Drive
NVIDIA® GeForce4™ Ti 4200 64MB DDR
5.1 Surround Sound with Optical Digital Output
Pioneer® DVR-A04 DVD-R/RW Writer
Black Navigator Case with 200-Watt PS
Four USB 2.0 Ports and Three IEEE 1394 Ports
10/100 Integrated Ethernet Controller
Black Microsoft® Internet Keyboard
Black Microsoft® Intellimouse Explorer 3.0
Navigator Remote Control with Infrared Blaster
Navigator TV Tuner PCI Card
Navigator Media Card Reader
Microsoft® Windows® XP Media Center Edition
1-Year Toll-Free 24/7 Technical Support
with Aliencare On-Site Home Service
Personalized Owner's Manual
FREE Exclusive Alienware® T-Shirt
FREE Custom Alienware® Mouse Pad
Optimized & Configured for High-Performance

$1,999.00

The Best of Computing and Home Entertainment.

Introducing the Alienware® Navigator

Powered By Microsoft® Windows® XP Media Center Edition

intel inside pentium 4

NAVIGATOR

From the maker of the most powerful and innovative computing solutions available, comes the ultra-compact Navigator line. Smaller than traditional desktops, the Navigator and Navigator Pro models combine the advanced multi-media functionality of Microsoft® Windows® XP Media Center Edition with state-of-the-art performance, in a compact all-in-one solution.

Custom Build your Dream Machine at **WWW.ALIENWARE.COM** or Call Toll-Free: **1-800-ALIENWARE (254-3692)**

Prices, configurations, and availability may change without notice. Monitor and speakers sold separately. Taxes and shipping charges not shown. Alienware can not be held responsible for errors in photography or typography. On-site service may be provided via contracted third party, service not available in all areas. Technician will be dispatched if deemed necessary following telephone-based troubleshooting. For complete information on our warranty, support, and on-site service, visit www.alienware.com. For hard drives, GB means 1 billion bytes and accessible capacity may vary depending on configuration. For CD-ROM, DVD-ROM, CD-RW, and DVD+RW/+R drive(s), maximum data transfer rates may vary and discs created with these drives may not be compatible with all drives and players. For modems and network cards/hardware, maximum achievable data transfer rates may vary. Award(s) and quote(s) listed do not pertain to a specific system or configuration. Intel, Intel Inside Logo, and Pentium are registered trademarks of Intel Corporation. All registered trademarks and trademarks are the property of their respective owners. Actual case may vary in design.

FULL DISCLOSURE

STEPHEN MANES

What's Not Hot (Alas!) for 2003

WHAT TECHNOLOGICAL BREAKTHROUGHS won't happen in 2003? The same as in most years: all the ones you really want. When the hardware industry isn't churning out boring boxes same as they ever were (only faster), it's indulging in replays of market failures like pricey computers that mimic cheap TV sets and legal pads. When the software industry isn't churning out bugs and security glitches, it's stuffing its products with dubious new features that lead to more bugs and security glitches.

The more inventive consumer-electronics industry increasingly develops slick products such as camcorders that link to PCs, but the devices are becoming as complex as the machines they connect to. And with both computers and consumer gear, progress seems to have slowed on fronts that really matter, at least to me. Things like:

Speech recognition: The era when PCs will be great at speech recognition always seems to be just a couple of years away. Though dictation programs like Dragon Naturally Speaking do a decent job of capturing what you say, they're dependent on training a single speaker, and they're still clunky when it comes to fixing what they get wrong. Speaker-independent systems like phone menus that let you use your voice instead of a keypad work well, but only with limited vocabularies.

I love my Olympus DM-1 digital voice recorder, but I want to use it to record a meeting and then have software transcribe it accurately no matter who's talking. That kind of system doesn't even seem to be on anyone's radar screen.

2003
TECHNOLOGY
BREAKTHROUGHS

ILLUSTRATION: JOHN CUNEO

It'll be a great year—especially if you like hype, bad ideas, and unkept promises.

Phone/data combos: Actually, this idea is getting there—see "The New (Improved?) Wireless Web" on page 133—but nobody has come up with the perfect combination of phone, data, and network. The best so far are T-Mobile's Sidekick and Handspring's Treo devices. Both have acceptable thumb keyboards, but neither has a removable battery or a great screen. The weakest link is a costly one to fix: U.S. cell networks that are so spotty you're never sure you'll see your e-mail when it arrives.

Long-lasting portables: Chemistry—as in batteries—is the most frustrating aspect of portable devices. Low-power chips help; for example, a new version of Wi-Fi should aid the staying power of wireless PDAs. But just lighting a screen sucks up lots of juice, and low-power displays have been slow to arrive in real products.

High-definition TV programming: Once you see a few good shows in HDTV, looking at a standard screen becomes downright painful. Plenty of fine, if costly, high-def TV receivers are available now, but the vast majority of shows are still distributed only in standard definition. This will gradually change as program providers swap out aging equipment for the good stuff, but bandwidth and fiscal constraints will slow adoption. At least HD DVDs are on the way. But not this year.

Comprehensible software: My Windows 2000 machine recently slowed to the speed of tectonic plates—except when it came to crashing. Eventually I discovered that Windows itself was arrogating 99 percent of my PC's processing power even when it was just idling. The latest service pack seems to have solved the problem, but I have no idea why. What happened to "self-repairing software"? What happened to useful documentation?

Alas, inexplicable software and inadequate manuals are standard features of computing today. And I wouldn't bet on their being fixed anytime soon. ■

Visit find.pcworld.com/31595 to see more columns by Contributing Editor Stephen Manes. He has been writing about PCs for nearly two decades.

IDG INTERNATIONAL DATA GROUP Volume 21, number 1. *PC World*™ (ISSN 0737-8939) is published monthly at $24.95 for one year (12 issues), $49.90 for two years (24 issues), $74.85 for three years (36 issues) by PC World Communications, Inc., 501 Second Street #600, San Francisco, CA 94107. Foreign orders must be prepaid in U.S. funds with additional postage. Add $12 per year for Canada; add $30 per year for all other countries. Canadian GST Registration #R124669680. Periodicals Postage Paid at San Francisco, California, and at additional mailing offices. Canada Post International Publications Mail Product, (Canadian Distribution) Sales Agreement No. 2493993. POSTMASTER: Send address changes to *PC World*, Subscription Dept., P.O. Box 37571, Boone, IA 50037-0571. Editorial and business offices: 501 Second St. #600, San Francisco, CA 94107, 415/243-0500.

Copyright © 2003, PC World Communications, Inc. All rights reserved. The trademark **PC World** is owned by International Data Group and used under license by PC World Communications, Inc. **PC World Top 10™, Top 10™, PC World Top 100™, Top 100™, and Consumer Watch™ are trademarks of International Data Group, Inc., and used under license by PC World Communications, Inc. Printed in the United States.**

Light enough to travel the world.

Powerful enough to rule it.

Dell | Home/Small Business

Inspiron™ 4150 Notebook

NEW Thin and Light Notebook

- Mobile Intel® Pentium® 4 Processor-M at 1.70GHz
- 14.1" XGA TFT Display
- 256MB DDR PC2100 SDRAM
- 30GB Ultra ATA Hard Drive
- 16MB DDR ATI® MOBILITY™ RADEON™ 7500 AGP 4X Graphics
- Modular 24x Max CD-ROM Drive
- Internal Modem and NIC Included
- Windows® XP Home Edition, Works Suite 2002
- 1-Yr Mail-In Service

$1299 Ask about our financing plans for qualified customers
E-VALUE Code: 14492-S81212

Recommended upgrade:

- NEW Dell™ TrueMobile™ 1180 Wireless Networking PC Card, add $79

Introducing the NEW Inspiron 4150. Starting at just 5.6 lbs. and 1.4" thin, it's strapped with Intel's® fastest mobile processor ever, the NEW Mobile Intel® Pentium® 4 Processor-M at up to 2.20GHz. That's like putting the power of a desktop in your carry-on bag. Enjoy cable-free, hassle-free performance and your choice of internal optical drives. It can even be customized with your choice of colored palm rests and display back insert. Maximum convenience, maximum speed. All in a stylish little notebook that's backed by Dell's award-winning service and support. Now great portability and great power are easy as Dell.

CNET – Top 5 Thin and Light Notebooks
CNET.com
Inspiron 4150
– September 2002

intel inside m pentium 4

Amazingly powerful, amazingly portable. **Easy as DELL™**

Click **www.dell.com/pcworld** Call **1-888-714-3355**
toll free

Dell recommends Microsoft® Windows® XP Professional for Mobile Computing

GO Online for Latest Prices and Weekly Promotions

Work hard. Play hard. We make it easy.

Dell | Small Business Desktops

Dimension™ 2350 Desktop

NEW Mainstream Desktop Solution
- Intel® Pentium® 4 Processor at 1.80GHz
- 128MB Shared DDR SDRAM
- NEW 30GB (7200 RPM) Ultra ATA/100 Hard Drive
- 15" (13.8" v.i.s.) E551 Monitor
- Integrated Intel® 3D Extreme Graphics
- 48x Max CD-ROM, Integrated Audio
- Harman Kardon HK-206 Speakers
- Integrated 10/100 Ethernet
- Windows® XP Home Edition; WordPerfect® Productivity Pack
- 1-Yr Limited Warranty; 1-Yr On-Site Service

$599 as low as **$17**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S51205y

Recommended upgrades:
- 256MB Shared DDR SDRAM, add $50
- Windows® XP Professional, add $60

Dimension™ 4550 Desktop

NEW Advanced Desktop Solution
- Intel® Pentium® 4 Processor at 2GHz
- 128MB DDR SDRAM
- NEW 60GB (7200 RPM) Ultra ATA/100 Hard Drive
- 17" (16.0" v.i.s.) E772 Monitor
- 32MB ATI® RAGE™ Ultra Graphics Card
- NEW 48x/24x/48x CD Burner; Integrated Audio
- Harman Kardon HK-206 Speakers
- Integrated Intel® PRO 10/100 Ethernet
- Windows® XP Home Edition; Works Suite 2002
- 1-Yr Limited Warranty; 1-Yr On-Site Service

$799 as low as **$23**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S51207y

Recommended upgrades:
- 256MB DDR SDRAM, add $50
- 3-Yr Limited Warranty; 3-Yr On-Site Service, add $119

OptiPlex™ GX260 Desktop

Network-Optimized High Performance PC
- Intel® Pentium® 4 Processor at 2.40GHz
- 256MB Shared DDR SDRAM
- 40GB (7200 RPM) Hard Drive
- Integrated Intel® Extreme Graphics
- 40x Max CD Burner
- Integrated Intel® PRO Gigabit™ Network Connection
- Office XP Small Business and Adobe® Acrobat® 5.0 Bundle; Windows® XP Professional
- 3-Yr Next Business Day On-Site Service
- Monitor Not Included

$999 as low as **$29**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S31209

Recommended upgrades:
- 15" Dell™ UltraSharp™ 1504 Flat Panel Monitor, add $449
- 3-Yr Same-Day 4-Hour (5x10) On-Site Service, add $99

Dell | Small Business Notebooks

Inspiron™ 2650 C Notebook

Affordable Performance Notebook
- Intel® Celeron® Processor at 1.50GHz
- 14.1" XGA TFT Display
- 128MB DDR PC2100 SDRAM
- 20GB Ultra ATA Hard Drive
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4X Graphics
- Fixed Internal 24x Max CD-ROM Drive
- Internal Modem and NIC Included
- Windows® XP Home Edition; WordPerfect® Productivity Pack with Quicken® New User Edition
- 1-Yr Mail-In Service

$899 as low as **$25**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S81208

Recommended upgrades:
- Windows XP Professional, add $79
- NEW Dell TrueMobile™ 1150 Wireless Networking PC Card, add $79

Inspiron™ 8200 Notebook

Extreme Performance Notebook
- Mobile Intel® Pentium® 4 Processor-M at 1.70GHz
- 15" Super XGA+ TFT Display
- 128MB DDR PC2100 SDRAM
- 30GB Ultra ATA Hard Drive
- 32MB DDR NVIDIA® GeForce4 440 Go™ AGP 4X Graphics
- Fixed Internal 8x Max DVD-ROM Drive
- Internal Modem and NIC Included
- 8-Cell Li-Ion Battery w/ ExpressCharge™ Technology
- Windows® XP Home Edition; Works Suite 2002
- 1-Yr Mail-In Service

$1499 as low as **$43**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S81214

Recommended upgrade:
- Windows® XP Professional, add $79

Latitude™ C640 Notebook

Network-Optimized Mobility Notebook
- Mobile Intel® Pentium® 4 Processor-M at 2GHz
- 14.1" XGA Active Matrix Display
- 128MB DDR PC2100 SDRAM (Up to 1GB)
- 20GB Ultra ATA/100 Hard Drive
- 32MB DDR AGP 4X ATI® Radeon™ Video
- Modular 24x Max CD-ROM/Floppy Drive
- Internal Modem and NIC Included
- Internal Wireless-Ready Antenna
- Windows® XP Professional
- 3-Yr Mail-In Service

$1449 as low as **$42**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S71214

Recommended upgrades:
- 8x Max DVD-ROM, add $129
- 3-Yr CompleteCare™ Accidental Coverage, add $169

Dell | Servers and Workstations

PowerEdge™ 600SC Server

NEW Entry-Level Value Server
- Intel® Celeron® Processor at 1.70GHz
- 128MB 200MHz ECC DDR SDRAM
- Upgradeable to 4GB of Memory
- 20GB (7200 RPM) IDE Hard Drive
- Upgradeable to 480GB of Internal Hard Drive Storage
- Embedded Intel® PRO Gigabit™ NIC
- Five PCI Expandability Slots (4-64/33MHz, 1-32/33MHz)
- 1-Yr 24x7 Dedicated Server Phone Tech Support
- 1-Yr Next Business Day On-Site Service
- Small Business Pricing

$449 as low as **$13**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S21204s

Recommended upgrades:
- Intel® Pentium® 4 Processor at 1.80GHz, add $199
- System Including Windows® 2000 Server, only $1249

PowerEdge™ 1600SC Server

NEW Reliable High Performance Server
- Intel® Xeon® Processor at 1.80GHz
- Dual Intel® Xeon® Processor Capable (Up to 2.80GHz)
- 128MB 200MHz ECC DDR SDRAM (Up to 4GB)
- 18GB (10,000 RPM) Ultra320 SCSI Hard Drive
- Upgradeable to 438GB of Internal Hard Drive Storage
- Embedded Intel® PRO Gigabit™ NIC
- Six PCI Slots (2-64/100MHz, 2-64/66MHz, 2-32/33MHz)
- 1-Yr 24x7 Dedicated Server Phone Tech Support
- 1-Yr Next Business Day On-Site Service
- Small Business Pricing

$899 as low as **$26**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S21208s

Recommended upgrades:
- Network Custom-Install Site Survey, add $199
- PowerConnect 2124™ 24+1 Ethernet Switch, add $299

Dell Precision™ 350 Workstation

NEW Affordable, Scalable Performance Workstation
- Intel® Pentium® 4 Processor at 2.26GHz
- 128MB PC1066 RDRAM
- 20GB (7200 RPM) EIDE Hard Drive
- 32MB ATI® RADEON™ VE VGA AGP 4X Graphics
- 48x Max CD-ROM Drive, Integrated Sound
- Integrated Intel® PRO Gigabit™ Network Connection
- Windows® XP Professional; Mini-Tower Chassis
- Lifetime 24x7 Dell Precision™ Dedicated Tech Support
- 3-Yr Next Business Day On-Site Service
- Monitor Not Included

$849 as low as **$25**/mo., (46 pmts.)
60 Days Same-As-Cash
E-VALUE Code: 14493-S41208

Recommended upgrades:
- 3-Yr Same-Day 4-Hour (5x10) On-Site Service, add $199
- 15" Dell UltraSharp™ 1504 Flat Panel Monitor, add $449

Click www.dell.com/pcworld Call 1-800-714-3355

Dell | Home Desktops

Dimension™ 2350 Desktop

Outraggeous Deal

- Intel® Pentium® 4 Processor at 1.80GHz with 512K L2 Cache
- 128MB Shared* DDR SDRAM at 266MHz
- NEW 30GB Value Hard Drive (5400 RPM)
- 15" E151P Flat Panel Display
- Integrated Intel® 3D Extreme Graphics
- 48x Max CD-ROM Drive
- Integrated Audio
- Harman Kardon HK-206 Speakers
- 56K Modem and Integrated NIC
- Windows® XP Home Edition, Works Suite 2002
- 6 Months MSN® Powered by Dell™ Internet Access Included
- 1-Yr Limited Warranty, 1-Yr At-Home Service

Regular Price	Now Only	
~~$799~~	$699	after $100 mail-in rebate **E-VALUE Code: 14493-D51207y**

Dimension™ 4550 Desktop

Holiday Entertainment System

- Intel® Pentium® 4 Processor at 2.40GHz with 533MHz System Bus and 512K L2 Cache
- NEW 256MB DDR SDRAM at 333MHz
- NEW 60GB Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., .25dp) M782 Flat Screen Monitor
- 64MB DDR NVIDIA® GeForce4 MX™ Graphics Card with TV-Out
- 16x Max DVD-ROM Drive
- NEW 48x/24x/48x CD-RW Drive with Roxio's Easy CD Creator® (2nd bay)
- Creative Audigy 2 Sound Card with DVD Audio
- Harman Kardon HK-395 Speakers with Subwoofer
- 56K Modem and Integrated Intel® NIC
- Windows® XP Home Edition, Works Suite 2002
- 6 Months MSN® Powered by Dell™ Internet Access Included
- 1-Yr Limited Warranty, 1-Yr At-Home Service

$1099 Ask us about no payments for 90 days for well qualified customers **E-VALUE Code: 14493-D51210m**

Dimension™ 8250 Desktop

Performance for All Seasons

- Intel® Pentium® 4 Processor at 2.40GHz with 533MHz System Bus with 512K L2 Cache
- NEW 256MB PC1066 RDRAM
- NEW 60GB Ultra ATA/100 Hard Drive (7200 RPM)
- 17" (16.0" v.i.s., .25dp) M782 Flat Screen CRT Monitor
- 64MB DDR NVIDIA® GeForce4 MX™ Graphics Card with TV-Out
- 48x Max CD-ROM Drive
- NEW 48x/24x/48x CD-RW Drive with Roxio's Easy CD Creator® (2nd bay)
- Creative Audigy 2 Sound Card with DVD Audio 1
- Altec Lansing® ADA745 4.1 Surround Speakers with Subwoofer
- 56K Modem and Integrated Intel® NIC
- Windows® XP Home Edition, Works Suite 2002
- 6 Months MSN® Powered by Dell™ Internet Access Included
- 1-Yr Limited Warranty, 1-Yr At-Home Service

$1399 Ask us about no payments for 90 days for well qualified customers **E-VALUE Code: 14493-D51213m**

Dell | Home Notebooks

Inspiron™ 2650 C Notebook

Practical and Affordable Mobility

- Mobile Intel® Celeron® Processor at 1.50GHz
- 14.1" XGA TFT Display
- 256MB DDR PC2100 SDRAM
- 20GB Ultra ATA Hard Drive
- 8x Max DVD-ROM Drive
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4X Graphics
- Sound Blaster® Compatible
- 59WHr Li-Ion Battery (8-Cell)
- Internal Modem and NIC Included
- Windows® XP Home Edition; WordPerfect® Productivity Pack with Quicken® New User Edition
- 6 Months MSN® Powered by Dell™ Internet Access Included
- 1-Yr Limited Warranty, 1-Yr Mail-In Service

$999 Ask us about no payments for 90 days for well-qualified customers **E-VALUE Code: 14493-D81209n**

Inspiron™ 2650 Notebook

Mobile Power, Great Price

- Mobile Intel® Pentium® 4 Processor-M at 1.70GHz
- 14.1" XGA TFT Display
- 256MB DDR PC2100 SDRAM
- 20GB Ultra ATA Hard Drive
- 24x CD-RW/DVD Combo Drive with Roxio's Easy CD Creator®
- 16MB DDR NVIDIA® GeForce2 Go™ 100 AGP 4X Graphics
- Sound Blaster® Compatible
- 59WHr Li-Ion Battery (8-Cell)
- Internal Modem and NIC Included
- Windows® XP Home Edition, Works Suite 2002
- 6 Months MSN® Powered by Dell™ Internet Access Included
- 1-Yr Limited Warranty, 1-Yr Mail-In Service

$1249 Ask us about no payments for 90 days for well-qualified customers **E-VALUE Code: 14493-D81212n**

Inspiron™ 8200 Notebook

Ultimate Mobile Multimedia Performance

- Mobile Intel® Pentium® 4 Processor-M at 1.80GHz
- 15" Super XGA+ TFT Display
- 384MB DDR PC2100 SDRAM
- 30GB Ultra ATA Hard Drive
- 8x Max DVD-ROM Fixed Drive and 24x CD-RW Modular Drive
- 32MB DDR NVIDIA® GeForce4 440 Go™ AGP 4X Graphics
- Sound Blaster® Compatible Sound with Wavetable
- 66WHr Li-Ion Battery with ExpressCharge™ Technology (8-Cell)
- Internal Modem and NIC Included
- Windows® XP Home Edition, Works Suite 2002
- 6 Months MSN® Powered by Dell™ Internet Access Included
- 1-Yr Limited Warranty, 1-Yr Mail-In Service

$1829 Ask us about no payments for 90 days for well-qualified customers **E-VALUE Code: 14493-D81218n**

Call: M-F 7a-9p, Sat 8a-5p CT

"Telephone access (call your phone co. for details) and other surcharges for access may apply. Must register within 30 days of invoice and accept MSN Powered by Dell Terms of Service. You agree to be billed monthly fees after the initial service period. You may cancel service at any time. Offer valid for new customers only in U.S. households and must be over 18 years old with major credit card. Limited time offer.

Pricing, specifications, availability and terms of offer may change without notice. Taxes and shipping charges extra, and vary. New Home Systems for Dell Home Systems customers only. New Business Systems for Dell Small Business customers only. U.S. only. Dell cannot be held responsible for errors in typography or photography.

*This device has not been approved by the Federal Communications Commission for use in a residential environment. This device is not, and may not be, offered for sale or lease, or sold or leased for use in a residential environment until the approval of the FCC has been obtained.

For a copy of our Guarantees or Limited Warranties, write Dell USA L.P. Attn: Warranties, One Dell Way, Round Rock, Texas 78682. Service may be provided by third-party. Technician will be dispatched if necessary following phone-based troubleshooting. Subject to parts availability, geographical restrictions and terms of service contract. Service timing dependent upon time of day call placed to Dell. U.S. only. At-Home or On-Site service provided via third-party contract with customer. Technician will be dispatched, if necessary, following phone-based troubleshooting. Availability varies. Other conditions apply. For hard drives, GB means 1 billion bytes; accessible capacity varies with operating environment. Upload speeds are limited to 53Kbps. Download speeds are less (about 30Kbps). Speeds can vary by line condition and modem manufacturer. Analog phone line and compatible service required. Offer expires 01/31/2003, 11PM CT. Rebate coupon must be postmarked within 30 calendar days of your system ship date and rebate checks are ordinarily processed within 8-10 weeks. See www.dell4me.com/rebates or call 1-800-624-9897 for rebate coupon and details. CompleteCare service excludes theft, loss and damage due to fire or intentional damage. CompleteCare is currently not available in all states. Not available for Dell Home Sales customers in CA, FL or NY. Not available for Employee Purchase Program customers (Government, Healthcare and Relationship/ Faculty, Staff and Students) in CA or FL. May not be available to all customers. For complete details, visit http://www.dell.com/us/en/gen/services/service_service_contracts.htm. Monthly payment based on 48 month QuickLoan at 12.99% interest rate for qualified Small Business customers. Your interest rate and monthly payment may be same or higher depending on your creditworthiness. Minimum transaction size of $500 required. Maximum aggregate financed amount not to exceed $25,000. Under 60 Days Same As Cash QuickLoan, interest accrues during first 60 days after QuickLoan Commencement Date (which is five days after product ships) if balance not paid within these 60 days. OFFER VARIES BY CREDITWORTHINESS OF CUSTOMER AS DETERMINED BY LENDER. Taxes, fees and shipping charges are extra and may vary. Not valid on past orders or financing. QuickLoan arranged by CIT Bank to Small Business customers with approved credit. Between 32MB and 64MB of system memory may be allocated to support graphics, depending on system memory size and other factors. This term indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1GB/sec. For high speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required. Dell, the stylized E logo, E-Value, Dimension, Inspiron, Latitude, OptiPlex, PowerEdge and Dell Precision are trademarks of Dell Computer Corporation. Intel, Intel Inside, Pentium, SpeedStep and Celeron are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States and other countries. Microsoft, MSN and Windows are registered trademarks of Microsoft Corporation. HP and DeskJet are registered trademarks of Hewlett-Packard Corporation. Adobe is a registered trademark of Adobe Systems Incorporated. ©2002 Dell Computer Corporation. All rights reserved.

GO Online For Latest Prices and Weekly Promotions

Dell recommends Microsoft® Windows® XP Professional for Mobile Computing

The latest technology for less. **Easy as DELL**

The performance-driven desktop

for the value-minded shopper.

Dell | Home / Small Business

Dimension™ 4550 Desktop

NEW Advanced Desktop Solution

- Intel® Pentium® 4 Processor at 2.40GHz
- NEW 256MB DDR SDRAM
- NEW 60GB (7200 RPM) Ultra ATA/100 Hard Drive
- 17" (16.0" v.i.s.) E772 Monitor
- 32MB ATI® RAGE™ Ultra Graphics Card
- NEW 48x/24x/48x CD Burner
- Sound Blaster Live! 5.1 Digital Sound Card
- Integrated Intel® PRO 10/100 Ethernet
- Windows® XP Home Edition, Works Suite 2002
- 1-Yr Limited Warranty; 1-Yr On-Site Service

$899 Ask about our financing plans for qualified customers
E-VALUE Code: 14491-s51208y

Recommended upgrades:

- Harman Kardon HK-395 Speakers with Subwoofer, add $40
- 3-Yr Limited Warranty; 3-Yr On-Site Service, add $119

The NEW Dimension 4550 is the perfect blend of power and value. More than a great system at a great price, the Dimension 4550 gives you enhanced productivity thanks to the power of its Intel® Pentium® 4 processor at up to 2.80GHz. Not to mention that it's a system that will grow with you, allowing you to easily add software and peripherals as needed. So you get one powerful desktop, built just for you, that's backed by Dell's award-winning service and support. The NEW Dell Dimension 4550, considering everything you're getting, it's a wonder the price doesn't have more zeroes.

15th Annual *PC Magazine* Readers' Choice Award

"A" In Overall Desktop Category for 11th Time in 12 Years
– August 2002

The right system at the right price. **Easy as DELL**

Click **www.dell.com/pcworld** Call **1-888-714-3355**
toll free

Dell recommends Microsoft® Windows® XP Professional for Business

GO Online for Latest Prices and Weekly Promotions