

FIRST LOOK: FULLY LOADED POWERHOUSE PCs FOR \$1499

MICROSOFT  
OFFICE 2000  
MEETS THE WEB

# PC WORLD

WWW.PCWORLD.COM

FEBRUARY 1999



**DVD-ROM  
Upgrades**  
New Kits Hold  
Gobs of Data, Play  
CD-ROMs & Movies



**Best Web  
Brokers**  
We Rate Schwab,  
E-Trade, and Other  
Top Online Firms



**Natural-Born  
Virus Killers**  
Which Antivirus  
Packages Will Keep  
Your PC Protected?

## *From Today to 2002* **The Future of the PC**



**Revolutionary CPUs  
Displays to Die For  
New Net Technologies**

\$5.99 ♦ PRINTED IN USA





How do I make my personal computer  
really personal?



Compaq Presario® 5600-450



**COMPAQ**

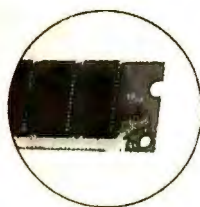




Easy. Have Compaq build one for you.

Who knows your computer needs as well as you? Nobody — so shouldn't you be the one to decide what goes into yours? When you order these Presario Internet PCs, you're in the driver's seat. You choose how much memory you want, hard drive size, whether you want a CD-ROM drive or DVD, advanced graphics, video memory, even the type of monitor you want. And you don't need a degree in computer engineering to build the computer that best suits your needs — we'll build it for you. And if you're not sure what features are best for you, we'll help you decide. Just call Compaq, visit our website, or stop by a Compaq *Built For You Custom PC Center* at select retailers. Bring the world's best-selling computer home today.

Here are some of the features we can personalize for you:



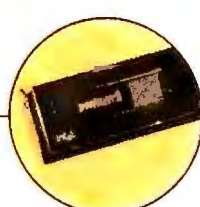
#### Memory

Speed up performance by choosing from 64 MB to a whopping 384 MB of Synchronous DRAM.



#### Hard Drive Size

Whether you're writing the great American novel or just surfing the Net, we've got the hard drive size that's right for you.



#### Processor Speed

You can choose from the latest Intel® Pentium® II Processors, including the new 450 MHz.



#### CD-ROM/DVD

A built-in Zip drive, CD-ROM, or DVD drive is the perfect way to accessorize and get the most from your Presario PC.



#### Monitor/Display

All our monitors assure that your applications will be displayed boldly and vividly.

Buy direct from Compaq, or purchase yours at your favorite retailer.  
Visit us at [www.compaq.com/athome](http://www.compaq.com/athome) or call 1-800-328-8986.

**COMPAQ**  
Better answers.™



Buy one of these computers and get 50 free hours on the Net\* Here



Visit a Compaq  
Built For You  
Custom PC Center  
at select locations of  
these retailers:

ABC Warehouse,  
Best Buy,  
Brandsmart USA,  
Circuit City,  
Future Shop,  
h.h. Gregg,  
J&R Computer World,  
Nebraska Mega Mart,  
Office Depot,  
OfficeMax,  
RadioShack,  
Staples.

Take advantage of  
Compaq values at any of  
these qualified retailers:

ABC Warehouse,  
American Appliance,  
American TV,  
Best Buy,  
Big City Express,  
Brandsmart USA,  
Circuit City, CompUSA,  
CompUSA Direct,  
CDW, Computer Town,  
Conn's, DataVision,  
Dillard's, Fred Meyer,  
Fry's Electronics,  
Future Shop,  
the good guys!,  
h.h. Gregg, Insight,  
J&R Computer World,  
Micro Center,  
MicroWarehouse,  
Multiple Zones,  
Nationwide Computers &  
Electronics,  
Nebraska Mega Mart,  
Office Depot, OfficeMax,  
PC Connection, PC Mall,  
PC Richard & Son,  
PC Warehouse,  
RadioShack,  
RCS Computer Experience,  
Sears, Staples,  
State Street Discount,  
The Wiz,  
Tiger Direct,  
Tops Appliance City,  
T-Zone.



### Compaq Presario 1800-266

**\$2,099**  
-\$100 mail-in rebate\*\*

**\$1,999**

Base price includes:

- Intel® Pentium® II Processor, 266 MHz
- 13.3" TFT Active Matrix Display
- 32 MB SyncDRAM expandable to 160 MB
- 4.0 GB UltraDMA Hard Drive<sup>1</sup>
- 24X Max CD-ROM Drive<sup>3</sup>
- 56K ITU V.90 Modem<sup>2</sup>
- Smart Lilon Battery
- 512 KB L2 Pipeline Burst Cache
- 256-bit Accelerated Graphics w/2.5 MB VRAM
- Microsoft® Featured Home Collection
- Microsoft Windows®98

Personalize it by choosing:

- 64 MB SyncDRAM: Add \$100
- Additional Smart Lilon Battery: Add \$129
- Mobility Auto Adapter: Add \$129



### Compaq Presario 1800-300

**\$2,599**  
-\$100 mail-in rebate\*\*

**\$2,499**

Base price includes:

- Intel Pentium II Processor, 300 MHz
- 13.3" TFT Active Matrix Display
- 64 MB SyncDRAM expandable to 160 MB
- 4.0 GB UltraDMA Hard Drive<sup>1</sup>
- 2nd-Generation DVD-ROM Drive<sup>6</sup>
- 56K ITU V.90 Modem<sup>2</sup>
- Smart Lilon Battery
- 512 KB L2 Pipeline Burst Cache
- 256-bit Accelerated Graphics w/2.5 MB VRAM
- Microsoft Featured Home Collection
- Microsoft Windows98

Personalize it by choosing:

- 96 MB SyncDRAM: Add \$100
- 6.4 GB Hard Drive:<sup>1</sup> Add \$200
- Brief Carrying Case: Add \$119



### Compaq Presario 1800-300

**\$2,999**  
-\$100 mail-in rebate\*\*

**\$2,899**

Base price includes:

- Intel Pentium II Processor, 300 MHz
- 13.3" TFT Active Matrix Display
- 96 MB SyncDRAM expandable to 160 MB
- 6.4 GB UltraDMA Hard Drive<sup>1</sup>
- 2nd-Generation DVD-ROM Drive<sup>6</sup>
- 56K ITU V.90 Modem<sup>2</sup>
- Smart Lilon Battery
- 512 KB L2 Pipeline Burst Cache
- 256-bit Accelerated Graphics w/2.5 MB VRAM
- Microsoft Office 98
- Microsoft Windows 98

Personalize it by choosing:

- 160 MB SyncDRAM: Add \$100
- Executive Leather Briefcase: Add \$200
- Port Replicator: Add \$119

Get a \$100 rebate on these select Compaq Presario notebook PCs when you buy one for this Compaq Easy Internet Access free trial.\*\*



### Compaq LJ200

**\$129<sup>99</sup>**

- Single-head thermal inkjet technology
- Up to 600 x 600 DPI resolution
- Sharp text and sharp color prints
- Print Speeds:  
Up to 3½ pages per minute black  
Up to 1½ pages per minute color
- Paper tray holds up to 30 sheets



pentium® II

### Iomega Zip Built-In™ Drive

- Personalize your desktop by choosing an Iomega Zip Built-In™ Drive: Add \$79
- The standard in 100 MB portable storage
- One Zip disk equals the capacity of 70 floppies
- Reliable backup of your important stuff
- Easily carry files between work and home
- Plus: Buy a Zip 10-pak for only \$99 — so everyone in the family can store their own stuff



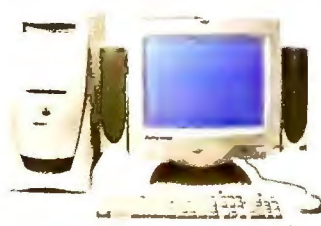
All prices shown are Compaq Direct selling price after applicable rebate. Prices shown do not include applicable sales tax and shipping. Products and services are offered when Compaq Easy Internet Access is chosen from Compaq Internet Setup. The 50 free hours must be used over a 30-day period. Trial of Compaq Easy Internet Access. Rebate offer valid only in the USA and expires 4/30/99. See rebate coupon included with product. Actual data transfer rates are currently unknown, may not reach 56 kilobits per second (Kbps), and will vary with line conditions. <sup>2</sup>24X Max CD-ROM data transfer rates may vary. DVD-ROM Drives run at a higher maximum transfer rate of up to 2.76 MB/s compared to 1st-Generation DVD-ROM Drives which run at a maximum transfer rate of 1.1 MB/s. Availability of G.Lite/56K V.90 services will vary by region and Internet Service Provider (ISP), and may differ from V.90 ISP service during the first 90 days of ownership. Labor for notebook systems is pick-up service. Compaq is not liable for pictorial or typographical errors. Intel, Intel Inside, and Pentium are registered trademarks of Intel Corporation. Product and company names mentioned herein may be trademarks and/or registered trademarks of other companies.



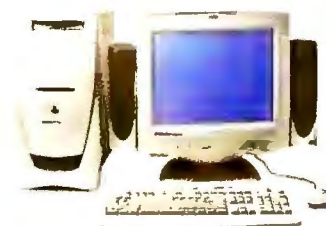
t a few of the hundreds of possible combinations:



(Shown with Presario MV700 Monitor)



(Shown with Presario MV700 Monitor)



(Shown with Presario MV700 Monitor)

0-300

### Compaq Presario 5600i-450

## \$2,549

#### Base price includes:

- Intel Pentium II Processor, 450 MHz
- 13.0 GB UltraDMA Hard Drive<sup>1</sup>
- 6X DVD-ROM Drive<sup>5</sup>
- 128 MB SyncDRAM expandable to 384 MB
- Diamond Viper 550 AGP w/16 MB SDRAM
- Diamond Monster Sound MX300 PCI Audio Card
- 56K ITU V.90 Modem<sup>2</sup>
- 10 Mbps Ethernet Port, Cable Modem Ready
- JBL Pro Studio w/Dual Subwoofers (160 watts)
- Digital Creativity Imaging Center
- Iomega Zip Built-In™ Drive
- Microsoft Featured Home Collection
- Microsoft Windows98
- Compaq V910 19" Monitor (18.0" VIA)

#### Personalize it by choosing:

- 256 MB SyncDRAM: Add \$250
- 16.8 GB UltraDMA Hard Drive:<sup>1</sup> Add \$89
- Presario FP700 Flat Panel Monitor (15.0" VIA): Add \$445

### Compaq Presario 5600i-450

## \$2,299

#### Base price includes:

- Intel Pentium II Processor, 450 MHz
- 13.0 GB UltraDMA Hard Drive<sup>1</sup>
- 32X Max CD-ROM Drive<sup>4</sup>
- 128 MB SyncDRAM expandable to 384 MB
- 2X AGP Graphics w/8 MB SGRAM
- Aureal 8820 PCI Audio Card
- 56K ITU V.90 Modem<sup>2</sup>
- Digital Creativity Imaging Center
- 10 Mbps Ethernet Port, Cable Modem Ready
- JBL Pro Speakers
- Microsoft Office 97 Small Business Edition
- Microsoft Windows98
- Compaq V910 19" Monitor (18.0" VIA)

#### Personalize it by choosing:

- 6X DVD-ROM Drive:<sup>5</sup> Add \$59
- Iomega Zip Built-In™ Drive: Add \$79
- 1.5Mb Max Digital Modem:<sup>8</sup> Add \$99

### Compaq Presario 5600i-450

## \$1,999

#### Base price includes:

- Intel Pentium II Processor, 450 MHz
- 13.0 GB UltraDMA Hard Drive<sup>1</sup>
- 6X DVD-ROM Drive<sup>5</sup>
- 96 MB SyncDRAM expandable to 384 MB
- 56K ITU V.90 Modem<sup>2</sup>
- 2X AGP Graphics w/8 MB SGRAM
- Aureal 8820 PCI Audio Card
- 10 Mbps Ethernet Port, Cable Modem Ready
- JBL Pro Speakers
- Microsoft Featured Home Collection
- Microsoft Windows98
- Compaq V720 17" Monitor (15.9" VIA)

#### Personalize it by choosing:

- Diamond Viper 550 AGP w/16 MB SDRAM: Add \$50
- Digital Creativity Imaging Center: Add \$39
- Diamond Monster Sound MX300 PCI Audio Card & JBL Pro Premium Speakers w/Subwoofer: Add \$88

### Compaq Presario 5600i-400

## \$1,799

#### Base price includes:

- Intel Pentium II Processor, 400 MHz
- 13.0 GB UltraDMA Hard Drive<sup>1</sup>
- 6X DVD-ROM Drive<sup>5</sup>
- 64 MB SyncDRAM expandable to 384 MB
- 56K ITU V.90 Modem<sup>2</sup>
- 2X AGP Graphics w/8 MB SGRAM
- Aureal 8820 PCI Audio Card
- 10 Mbps Ethernet Port, Cable Modem Ready
- JBL Pro Speakers
- Digital Creativity Imaging Center
- Microsoft Featured Home Collection
- Microsoft Windows98
- Compaq V720 17" Monitor (15.9" VIA)

#### Personalize it by choosing:

- 128 MB SyncDRAM: Add \$100
- Iomega Zip Built-In™ Drive: Add \$79
- 1.5Mb Max Digital Modem:<sup>8</sup> Add \$99

### Compaq Presario 5600i-350

## \$1,699

#### Base price includes:

- Intel Pentium II Processor, 350 MHz
- 13.0 GB UltraDMA Hard Drive<sup>1</sup>
- 32X Max CD-ROM Drive<sup>4</sup>
- 128 MB SyncDRAM expandable to 384 MB
- 56K ITU V.90 Modem<sup>2</sup>
- 2X AGP Graphics w/8 MB SGRAM
- Aureal 8820 PCI Audio Card
- 10 Mbps Ethernet Port, Cable Modem Ready
- JBL Pro Speakers
- Microsoft Office 97 Small Business Edition
- Microsoft Windows98
- Compaq V720 17" Monitor (15.9" VIA)

#### Personalize it by choosing:

- 16 GB UltraDMA Hard Drive:<sup>1</sup> Add \$89
- Compaq V910 19" Monitor (18.0" VIA): Add \$170
- Diamond Viper 550 AGP w/16 MB SDRAM: Add \$50

### Compaq Presario 5600-350

## \$1,599

#### Base price includes:

- Intel Pentium II Processor, 350 MHz
- 10.0 GB UltraDMA Hard Drive<sup>1</sup>
- 6X DVD-ROM Drive<sup>5</sup>
- 64 MB SyncDRAM expandable to 384 MB
- 56K ITU V.90 Modem<sup>2</sup>
- 2X AGP Graphics w/8 MB SGRAM
- Diamond Monster Sound MX300 PCI Audio Card
- 10 Mbps Ethernet Port, Cable Modem Ready
- JBL Pro Premium Speakers w/Subwoofer
- Microsoft Featured Home Collection
- Microsoft Windows98
- Compaq V720 17" Monitor (15.9" VIA)

#### Personalize it by choosing:

- 128 MB SyncDRAM: Add \$100
- 13.0 GB Hard Drive:<sup>1</sup> Add \$45
- Iomega Zip Built-In™ Drive: Add \$79



FILE SERVICE

in U.S. only. Actual retail price may vary. Specifications and prices are subject to change or cancellation without notice. Not all Compaq Presario models available in all retail stores. \*50 free hours of Internet access is initial setup. A valid credit card is required to initiate service, although no charges will be incurred until the 50-hour trial has expired. \*\*\$100 mail-in rebate from Compaq upon activation of this free initial terms and conditions. <sup>1</sup>For hard drives, GB = billion bytes. <sup>2</sup>ITU V.90 modems are designed only to allow faster downloads from K56flex or V.90 compliant digital sources. Maximum achievable download transmission rate is 1500 to 3600 KB/s. <sup>3</sup>32X Max CD-ROM data transfer rates may vary from 1800 to 6000 KB/s. The 6X DVD-ROM Drive transfer rate is up to 8,115 KB/s compared to 1,352 KB/s for 1X DVD-ROM Drives. <sup>4</sup>2nd-Generation of up to 1.348 MB/s. One year parts and labor. <sup>5</sup>G.Lite/56K V.90 updates may be downloaded from the Compaq Web site when available. The G.Lite/56K protocol is designed to allow faster downloads from G.Lite/56K V.90 maximum achievable download transmission rates with G.Lite/56K V.90 are currently unknown and may not reach 1.5Mb, and will vary with line conditions and distance. Labor for desktop systems is carry-in service with on-advertisement. Compaq, the Compaq Logo, and Presario registered in U.S. Patent and Trademark Office. Microsoft, MS, and Windows are registered trademarks of Microsoft Corporation. Intel, the Intel Inside Logo, and Pentium are trademarks of Intel Corporation. Call Compaq Monday-Friday 7:00am-11:00pm (CST), Saturday and Sunday 7:00am-7:00pm (CST). ©1999 Compaq Computer Corporation. All rights reserved.

Circle 35 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# To lead the way in portab



The BJC-50 Color  
Bubble Jet Printer.

*The road warrior's  
ultimate companion.*

*Incredibly compact at only 2 lbs.*

*Built-in IrDA for cable-less printing.*

*Vibrant, photo-realistic color.*

*Lithium Ion battery and universal adapter.*

*Crisp, sharp, black printing.*



Optional Auto  
Sheet Feeder.

*Holds up to  
30 sheets of paper.*



# le printing, it takes guts.



No other portable printers have what it takes to create photo-realistic Canon color. Nor do they include the option

## *Pop-in Color Scanning for \$99:*

*The optional IS-12  
Color Image Scanner Cartridge  
converts Canon portables  
into a 360 dpi color sheetfed  
scanner. Instantly.*

to scan. In color. Anywhere you

go on the planet. Our BJC-50

and BJC-80 Color Bubble Jet™

printers have it all. Thanks, in

part, to our exclusive Drop Modulation Technology™. Naturally,

both printers deliver sharp, black text as well. So call 1-800-OK-

CANON or visit our Web site at [www.ccsi.canon.com/lead](http://www.ccsi.canon.com/lead). And get

connected to our award-winning portable printers. Or should we

say scanners? **See what we mean.™**

# Canon



The BJC-80 Color  
Bubble Jet Printer.

## *The mobile desktop color printer.*

*Vibrant, photo-realistic color.*

*Crisp, sharp, black printing.*

*Built-in IrDA for cable-less printing.*

*Award-winning, compact 3.1 lb design.*

*Built-in 30-sheet feeder.*



## **Optional Battery Pack.**

*Lasts for up to 200 pages  
of printing per charge.*







---

**(PC Sold Separately)**



# Intel Inside... ViewSonic<sup>®</sup> on top!

## Turn traditional thinking on its ear.

Today, regardless of the PC brand you choose, the most important component is not the computer. It's the monitor. Yesterday the hot phrase was "Monitor Sold Separately." Today, it's "PC Sold Separately." Technology blurs the lines between one computer and another. They're all fast, all loaded, all pretty much the same. What's different, what's exciting is happening in displays—multimedia monitors with built-in teleconferencing capabilities, flat panel displays you can mount on the wall and high performance, large screen CRT displays.

The ViewSonic P817 21" (20.0" viewable) monitor is a case in point. With spectacular specs like .22mm horizontal dot pitch, a resolution of 2,048 x 1,536 at a rock solid 85Hz refresh rate and an amazing 360MHz video input bandwidth, it redefines display performance.

By putting ViewSonic's P817 on top of your priority list, you'll ensure your Visual Computing™ experience is excellent. At ViewSonic we developed the P817 with your vision in mind. TCO '99 certification. Limited 3 year warranty on parts, labor, and CRT. 48 hour Express Exchange® Service option available.

**For more information call ViewSonic at  
800-888-8583 and ask for agent 91367, or visit  
our website at: [www.viewsonic.com/pcworld](http://www.viewsonic.com/pcworld)**

(909) 869-7976 Fax: (909) 869-7958 • Specifications subject to change without notice.  
Copyright © 1999, ViewSonic Corporation, all rights reserved. Corporate names and trademarks stated herein  
are the property of their respective companies. Intel and the Intel Inside logo are registered trademarks of Intel.



[www.viewsonic.com](http://www.viewsonic.com)



## COVER STORY

## 104 YOUR PC IN THE NEW MILLENNIUM

Shoe-box PCs, 700-MHz CPUs, wafer-thin flat-panel displays, blindingly fast Net connections. The next three years promise dramatic changes in the way PCs look, feel, and act. Here's a sneak peak, plus a time-line guide to over two dozen new chips coming soon to a computer near you.

## FEATURES

## 123 VIRUCIDE!

**REVIEW** When you least expect it, you're infected. Today's viruses are smarter, stealthier, and more destructive than ever before. Defend yourself with the most merciless of seven top virus-killing packages.

## 143 TAKING DVD FOR A SPIN

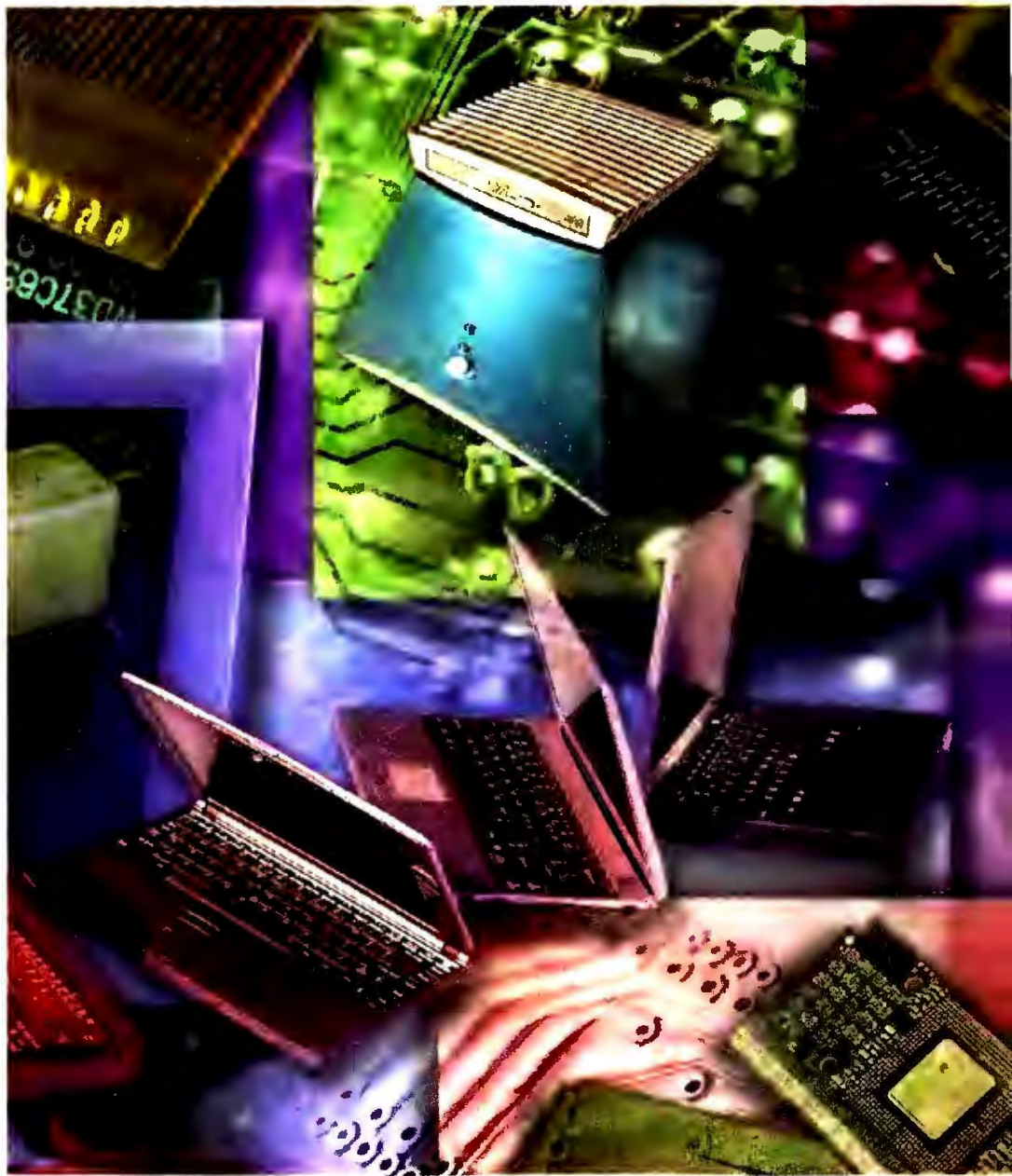
**REVIEW** DVD-ROM is tempting: 4.7GB of data, brisk performance, and of course those movies. Too bad so little business software is written for it. Still, DVD-ROM's the technology of choice for most new PCs. Our tests identify which companies make top models.

## 167 PICTURE PERFECT

**REVIEW**

Want to improve your image? Whether you're tinkering

with product photos on your company Web site or doctoring a picture of your home for a real estate brochure, photo-editing software can do the job. We review nine easy-to-use packages to find the ones that help your pictures look their best.



104



177

## SPECIAL REPORT

## THE WEB AND YOU

## 177 TRADING PLACES: THE TOP ONLINE BROKERS



Point, click, trade. Could it really be that easy? We bought and sold stock at Schwab, E-Trade, and six other popular online brokerages and discovered which traders were on the money.

**COVER** 3D computer rendering of future PC courtesy of GloDesign of Irvine, California.



Additional material available on PC World Online: [www.pcworld.com](http://www.pcworld.com)



## TOP OF THE NEWS

**46 ON TARGET! \$1499 PCS HIT THE MARK**  
Who needs Pentium II? Thanks to Intel's Celeron-366 and AMD's K6-2-400, a mere \$1499 will buy you a great system, with all the trimmings.

**51 MICROSOFT OFFICE 2000 ON THE WAY**  
A \$20 preview beta of Office adds Publisher, FrontPage, and other popular applications to its quiver, along with a slew of Web features and a few dubious "improvements."

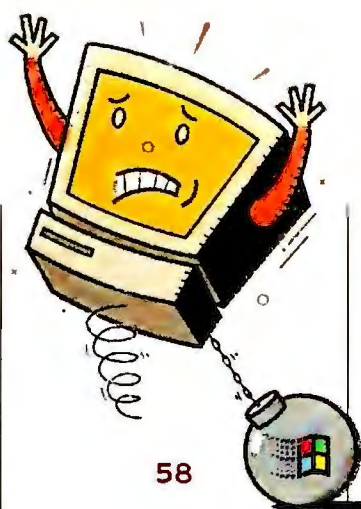
**52 TAKEN TO TAX**  
CD-ROM tax packages and their online counterparts help keep your money away from the IRS.

**58 WHY SOFTWARE COSTS ARE STILL GOING UP**  
Bill said as much in the hearings: Microsoft has been good for consumers. But a closer look links Redmond's market dominance to higher software prices.

**62 DVD-RAM: FAST, VAST, REWRITABLE**  
Finally, you can record and read up to 5.2GB on a single platter. But watch out for compatibility gotchas.

## NEW PRODUCTS

- 80** QuickBooks Pro 99 accounting package
- 81** Dell Latitude LT M266ST notebook
- 82** Lexis-Nexis Universe online databases; Aiwa Bolt, Sony SuperStation tape backup drives
- 84** Microsoft MapPoint 2000, ESRI Business-Map Pro 2.0; MarcoSoft Quo Vadis
- 86** Dragon Systems NaturallySpeaking Mobile voice recognition; NetZip Deluxe 6.3 compression utility
- 92** Lexmark Photo Jetprinter 5770, Polaroid ColorShot printers; Syntran Color Imaging CamPrint camera-printer connector
- 93** Dazzle Digital Video Creator video capture program; SPSS 9 business graphics software
- 96** Microsoft Publisher 2000; Symantec Norton 2000 Y2K utility
- 98** Cardiff Teleform 6 forms; Benwin Flat Panel BW2000 speakers



58



167



123



46

## TOP 100

**189 ARE STORE-BOUGHT PCs ENDANGERED SPECIES?**

**TOP 100** Long envious of mail-order stars like Dell, Gateway, and Micron, old-timers IBM and Compaq launch direct-to-buyer PC lines. The results: more choices and cheaper computers.

**192 POWER DESKTOPS**

**TOP 20** Steep discounts make for a near-sweep by PII-450s. One notable exception is Dell's chart-topping Optiplex GX1 400, a corporate 400-MHz PII.

**202 BUDGET DESKTOPS**

**TOP 20** From Unicent's spartan \$999 Avanta E333 to Micron's loaded, network-ready ClientPro 400 for \$1999, this month's economy machines run the gamut.

**212 NOTEBOOKS**

**TOP 10** Dell's Latitude CPi D300XT continues as top power notebook, while a lightweight Pentium II-266—Unicent's \$1899 Voyager 1212—is new budget champ.

**216 HOME PCS**

**TOP 10** The best budget PC, Quantex's new speed-demon QP6/333 M-1c, costs \$1099—dirt cheap, even for a Celeron.

**218 COLOR PRINTERS**

**TOP 10** Price cuts elevate Canon's BJC-5000 and Lexmark's Optra SC 1275 to first rank among small business/home and corporate color printers, respectively.

**221 19-INCH+ MONITORS**

**TOP 10** Our top 19-incher, Dell's \$549 Ultrascan P990, is priced to go. But if you gotta have the biggest monitor in town, check Cornerstone's 21-inch Imaging P1500.

**223 GRAPHICS BOARDS**

**TOP 10** Matrox and STB land a double one-two punch with the top boards on both the PCI and AGP charts.

**225 MODEMS**

**TOP 10** Need an internal modem? Check out IBM's 56K Modem Internet Kit. Want an external model? Diamond's Multimedia SupraExpress 56e merits attention.



## HERE'S HOW

### 232 WINDOWS TIPS



Format floppies fast, discover Win 98's secret utilities.

### 244 WINDOWS NT

Run both NT and Windows 95/98 on one hard disk, hassle-free.

### 246 ANSWER LINE

Return to Windows 95 after installing Win 98, does powering down your PC save much electricity?

### 248 INTERNET TIPS



Find what you need on the World Wide Web from within Netscape Navigator and Internet Explorer.

### 252 WORD PROCESSING

Create instant graphics shortcuts in Microsoft Word, replace symbols automatically in WordPerfect.

### 254 SPREADSHEETS



Display Excel's AutoFilter criteria in individual cells, shade alternating rows in Excel 97 or later.

### 262 HARDWARE TIPS



Reset your CMOS password safely, prevent hard disk errors.

### 264 UPGRADE GUIDE

Move up to Windows NT 4.0, step-by-step.



246

## RESOURCES

- 14 HOW TO CONTACT PC WORLD
- 22 COMING UP
- 266 MAIL-ORDER SHOPPING GUIDE
- 275 PC WORLD CATALOG
- 293 READER SERVICE CARD
- 295 ADVERTISER INDEX
- 297 EDITORIAL PRODUCT INDEX



35



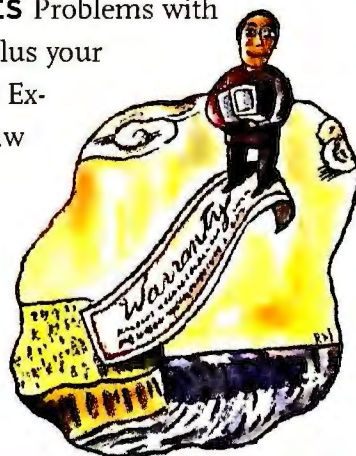
21



29

## DEPARTMENTS

- 17 **UP FRONT** How can you enjoy your new PC above the noise?
- 21 **LETTERS** Readers sound off on the iMac versus PCs.
- 29 **CONSUMER WATCH** What consumers should know—and do—about the Y2K bug.
- 33 **ON YOUR SIDE** Are extended PC warranties worthwhile?
- 35 **GOT A PROBLEM?** Building a low-cost network with simple cables and no LAN.
- 41 **HOME OFFICE** Steve Bass demonstrates how to tell pesky telemarketers to take a hike.
- 43 **BUGS AND FIXES** Problems with McAfee's suite, plus your monthly Internet Explorer security flaw report.
- 302 **FULL DISCLOSURE** How to keep your PC from becoming instantly obsolete.



33

## PCW ONLINE

### WOMEN TAKE OVER THE WEB

**NEWS** Four years ago women made up 3 percent of Americans online; today it's 40 percent. How is the Web changing—and how does that affect your business?  
[www.pcworld.com/feb99/webwomen](http://www.pcworld.com/feb99/webwomen)

### INTERNET DEAL OF THE DAY

**NEWS** Looking for an ultracheap monitor? An inexpensive color printer? Our intrepid reporter browses bargain Web sites.  
[www.pcworld.com/feb99/netdeals](http://www.pcworld.com/feb99/netdeals)

### PROTECT YOUR HOME PC WITH A UPS

**REVIEWS** They'll save your data when the lights go out. We look at six uninterruptible power supplies for small offices.  
[www.pcworld.com/feb99/ups](http://www.pcworld.com/feb99/ups)

### WEB SITES IN THE NEWS

**NEWS** Stay abreast of the changing Web with site reviews from PC World Today.  
[www.pcworld.com/feb99/sitereviews](http://www.pcworld.com/feb99/sitereviews)



**PC WORLD ONLINE**  
[www.pcworld.com](http://www.pcworld.com)

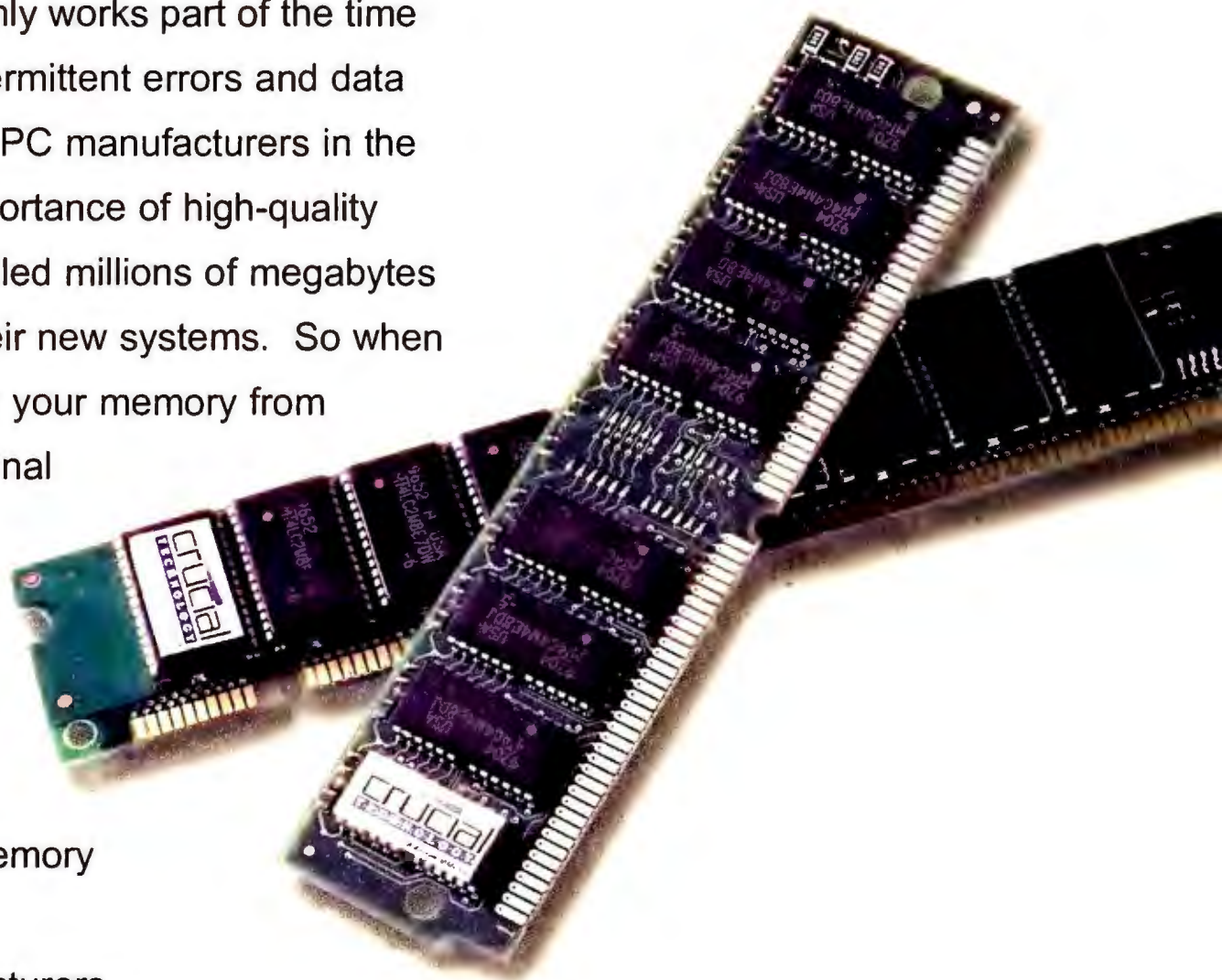






# IBM, HP, Gateway, Apple and **Use Our Memory. Now**

Memory is one of the most critical components in your system and it matters who makes it. Errors in design, sloppy production, or substandard shipping can leave you with memory that simply doesn't work. Or worse . . . it only works part of the time and leaves you with intermittent errors and data corruption. The largest PC manufacturers in the world recognize the importance of high-quality memory and have installed millions of megabytes of Micron memory in their new systems. So when it's time to upgrade, buy your memory from the same place the original system manufacturers do. Through Micron's memory upgrade division, Crucial Technology, you can buy the same quality memory that Micron sells to the original system manufacturers.



**Order factory-direct at:**

**[www.crucial.com](http://www.crucial.com)**

**or call toll free: 1-877-376-7721**

Crucial Technology, a Division of Micron, 8455 Emerald Street, Boise, Idaho, 83704.  
208-363-5500 phone, 208-363-5609 fax. E-mail [crucial.sales@micron.com](mailto:crucial.sales@micron.com)

Copyright 1998 Micron Semiconductor Products, Inc. All rights reserved. Crucial Technology is a trademark of Micron Technology, Inc., and Micron is registered trademark of Micron Technology, Inc. All other brands and names used herein are the property of their respective owners.



# Micron Electronics You Can Too!

## No One Knows Memory More Than The One Who Makes It

It's been proven time and again that buying direct from the manufacturer has significant advantages. Prices are lower. Quality is higher. And you deal directly with the people who know and understand the products they build. We have more than 2,000 engineers and technicians dedicated to manufacturing the highest-quality memory. (Most of our competitors don't have that many total employees!) Memory is all we sell it's all we think about; it's all we manufacture.

Consequently, no other company is better at providing you with the exact memory you need, in the right configuration, at the right price. We are the memory experts.

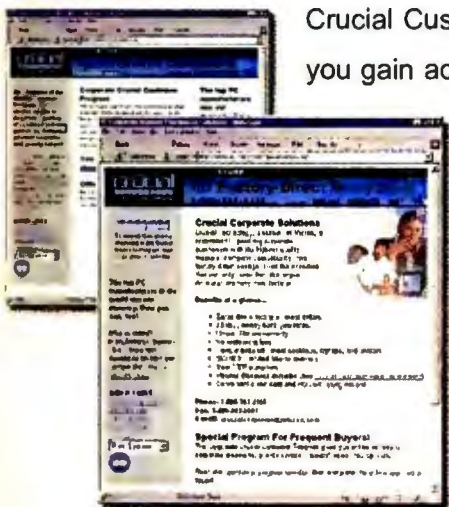


## Corporate Buyers Program

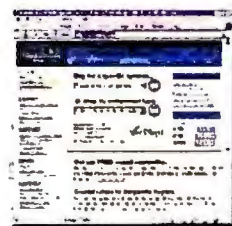
As a corporate buyer, there's probably two things you don't have enough of: time and money. Join our Crucial Customer program, and you will save both. As a Corporate

Crucial Customer, you not only receive dedicated account service, you gain access to our "members only" Corporate Web site. With

a secured username and password, you receive your **discounted pricing of up to 15%**, and you can order 24 hours a day through a streamlined process. Crucial Customers also have the benefit of receiving timely e-mail alerts of pricing and availability changes. Sign up today at [www.crucial.com/corporate](http://www.crucial.com/corporate) for instant access and an immediate discount.



**15,000 upgrades**  
for over **5,000**  
**systems –**  
**all online!**



Our online memory selector covers over 5,000 systems from more than 50 different manufacturers. There is no easier way to find the exact memory upgrade you need for one system or one hundred systems. Simply point and click. Our Memory Selector does the work of finding the right upgrade at the right price.

## Computer Memory as low as:

	128 MB Upgrade	64 MB Upgrade	32 MB Upgrade
<b>Gateway</b>			
G Series	\$399.96	\$199.98	\$69.99
P Series	\$319.98	\$199.98	\$119.98
Family Series	\$399.96	\$199.98	\$119.98
<b>Micron Electronics</b>			
Millennia	\$399.96	\$199.98	\$69.99
Home MPC	\$399.96	\$199.98	\$119.98
Powerstation	\$399.96	\$199.98	\$119.98
ClientPro	\$399.96	\$199.98	\$69.99
Magnum	\$399.96	\$199.98	\$119.98
<b>IBM</b>			
Aptiva	\$399.96	\$199.98	\$69.99
PC 300 Series	\$399.96	\$199.98	\$69.99
ThinkPad	\$439.98	\$219.99	\$99.99
<b>HP</b>			
Pavilion	\$399.96	\$199.98	\$69.99
Kayak	\$219.98	\$109.99	\$69.99
<b>Apple</b>			
iMac	\$399.98	\$199.99	\$99.99
Performa	NA	\$199.98	\$119.98
PowerMac	NA	\$199.98	\$99.99
(5200, 6300, 6100)			
PowerMac	\$463.96	\$231.98	\$115.99
(7100, 7200, 7500, 7600, 8500, 9500)			

Please visit [www.crucial.com](http://www.crucial.com) for our full line of memory upgrades and current prices. Individual prices may vary according to your specific system and memory type.

- **Guaranteed Compatibility**
- **30-Day Money-Back Guarantee**
- **Same-Day Shipping on Most Orders**
- **Dedicated Account Service**
- **Memory-Expert Salespeople**

- **Free Technical Support**
- **Limited Lifetime Warranty**
- **Cross Shipping on Returns**
- **Volume Discounts Available**
- **Most Complete Memory Selector**

**crucial**  
**TECHNOLOGY**  
*A Division of Micron*  
**Your Factory-Direct Memory Source**

Circle 50 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



## **What a laptop can do.**

1. Get e-mail. 2. Send e-mail. 3. Search the Net. 4. Prepare memos. 5. Check appointments and contacts. 6. Set up a new derivative pricing model. 7. Put together a 3D animated short film. 8. Lay out the company newsletter. 9. Analyze data from radio telescopes. 10. Edit digital video. 11. Design a new kitchen. 12. Develop new software. 13. Develop new CD-ROMs. 14. Retouch swimsuit photos. 15. Play photo-realistic 3D video games. 16. Assist with scientific visualization. 17. Play back audio CD. 18. Expedite numerical analysis. 19. Do mail merges for the high school reunion (unless you went to a really small high school). 20. Aid in digital signal processor design. 21. Do database programming. 22. Use lots of floppy disks. 23. File income tax returns. 24. Composite digital video. 25. Author virtual reality. 26. Store a large number of files. 27. Connect to a large number of external storage devices. 28. Play educational CD-ROMs. 29. Conduct virtual reality demonstrations. 30. Balance the checkbook for a Fortune 500 company. 31. Run spreadsheets with decision-making and nested functions. 32. Analyze spreadsheet data by creating pivot tables. 33. Aid in artificial intelligence programming (implementing some version of the sigmoid model). 34. Create organizational flow charts. 35. Build animation for presentations. 36. Replicate and synchronize databases. 37. Do voice analysis. 38. Do audio editing. 39. Create a greeting card. 40. Use smart cards. 41. Help business people practice Japanese with a language CD-ROM. 42. Help ordinary people decipher a prescription using a CD-ROM. 43. Play video clips. 44. Create 350

HP *Jornada*

Introducing the Jornada 820 Handheld PC. • Just 2.6 pounds.

- A convenient-size screen and keypad. • More than 10 hours of battery life.
- With a 56K modem and Pocket Office software built in. And less-vital stuff left out.
- \$999. Available at CompUSA, Fry's, Micro Center, J&R Computer World, and select Office Depot and Staples locations.

Powered by



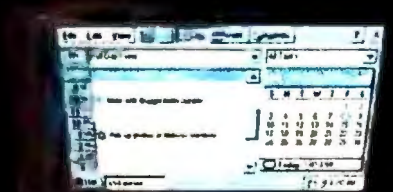
Microsoft®  
Windows®CE  
Handheld PC

Estimated street price subject to change. Microsoft, Windows and the Windows CE logo are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. ©1998 Hewlett-Packard Company.



## **What you really do.**

1. Get e-mail. 2. Send e-mail. 3. Search the Net. 4. Prepare memos. 5. Check appointments and contacts.



Expanding Possibilities

[www.hp.com/jornada](http://www.hp.com/jornada)



# PC WORLD

## EDITORIAL

**EDITORIAL DIRECTOR** Philip Lemmons  
**EDITOR IN CHIEF** Cathryn Baskin  
**EDITOR** Steve Fox  
**MANAGING EDITOR** Luis Camus  
**ART DIRECTOR** Robert Kanes  
**EXECUTIVE EDITORS** Tracey Capen, Yael Li-Ron, Bill Snyder, Daniel Tynan  
**SENIOR NEWS EDITORS** Dan Miller, Randy Ross  
**SENIOR REVIEWS EDITOR** Anita Epler  
**SENIOR FEATURES EDITOR** Brad Grimes  
**SENIOR TECHNICAL EDITOR** Karl Koessel  
**SENIOR WRITER, FEATURES** Harry McCracken

**ASSISTANT MANAGING EDITOR** Anne Kandra  
**SENIOR ASSOCIATE EDITORS** Yardena Arar, Vince Bielski, Bryan Hastings, Michael S. Lasky, Laurianne McLaughlin, Katherine Ozment, Karen Silver

**ASSOCIATE EDITORS** Andrew Brandt, Michelle Campanale, Cameron Heffernan, Aoife M. McEvoy

**TECHNICAL EDITOR** Shane Rau  
**STAFF EDITORS** Grace Aquino, Angela Navarrete  
**ASSISTANT EDITOR** Mick Lockey  
**RESEARCH EDITOR** Jean Lieske  
**EDITORIAL ASSISTANT** Kalaivani Murugesan

**COPY CHIEF** Kimberly Stein  
**SENIOR COPY EDITOR** Barbara Lewis  
**COPY EDITOR/LETTERS EDITOR** Stephen Compton  
**COPY EDITORS** Steven Gray, David Hayward, Carol Pragides  
**EDITORIAL PRODUCTION ASSOCIATE** Henry Pham  
**ASSISTANT TO EDITORIAL DIRECTOR** Linda L. Grubbs  
**ADMINISTRATIVE ASSISTANTS** Yvette Joplin, Heather Morra  
**BUSINESS MANAGER** Heidi Anderson

## ART AND DESIGN

**ASSOCIATE ART DIRECTORS** Barbara Adamson, Tim J. Luddy

**ASSISTANT ART DIRECTORS** Kate Godfrey, Carolyn Perot  
**SENIOR DESIGNER, INFOGRAPHICS** Jeff Berlin  
**SENIOR DESIGNER** Beth Kamoroff  
**ASSISTANT DESIGNER, INFOGRAPHICS** Robin Briskin  
**PRODUCTION ARTIST** Marlene Tobias

## CONTRIBUTING EDITORS

Steve Bass, George Campbell, Scott Dunn, Roberta Furger, Judy Heim, Stephen Manes, James A. Martin, Stan Miastkowski, Lincoln Spector, Scott Spanbauer, Kirk Steers, Carla Thornton, John Walkenbach, Christina Wood

## PC WORLD TEST CENTER

**TEST CENTER DIRECTOR** Julian Milenbach  
**ASSOCIATE TEST CENTER DIRECTOR** Ulrike Diehlmann  
**MANAGER, BENCHMARK DEVELOPMENT** William L. Rinko-Gay  
**TEST MANAGER** Nancy H. Miller  
**PERFORMANCE ANALYSTS** Robert P. James, Elliott S. Kirschling, Jeffrey Kuta, Mike Salayko  
**TEST CENTER COORDINATORS** Christopher B. Patterson, Julian Weatherby

## PCW ONLINE

**ACTING EDITOR IN CHIEF** Philip Lemmons  
**MANAGING EDITOR** Rebecca Freed  
**EXECUTIVE EDITOR, NEWS** Eric Bender  
**EXECUTIVE EDITOR, TIPWORLD** Jim Welp  
**SENIOR EDITOR, NEWS** Peggy Watt  
**SENIOR EDITOR, REVIEWS** Rex Farrance  
**ASSOCIATE EDITOR, HERE'S HOW** Matthew Newton  
**ASSISTANT EDITOR** Arin Hailey  
**REPORTER/EDITOR** Tom Spring  
**STAFF EDITOR** Amy Ng  
**COPY EDITOR** Kim Saccio-Kent  
**DIRECTOR, PRODUCT DEVELOPMENT** Adam Block  
**DESIGN MANAGER** Grace Woo  
**DESIGN ASSOCIATE** Hao Quach

**PRODUCT MANAGER** Carla Lieberman  
**MANAGER, APPLICATIONS DEVELOPMENT** Matt Turner  
**APPLICATIONS DEVELOPERS** Alison King, Simon King  
**TECHNICAL MANAGER, APPLICATIONS DEVELOPMENT** David Harpe  
**PROJECT MANAGER** Licia Slimon  
**PRODUCER** Lisa Engelbert  
**SENIOR CONTENT ENGINEER** Nick Van Cleve  
**SYSTEMS ADMINISTRATOR** Tom Cowan  
**PRODUCT DEVELOPMENT MANAGER** Susanna Camp  
**SENIOR APPLICATIONS DEVELOPER/PROJECT MANAGER** Laura Koetzle

## USER GROUP BOARD

Steve Bass, Pasadena IBM Users Group; Roger Bender, Microcomputer Managers Association; Jack Bolton, Atlanta PC User's Group (APCUG); Brian Camenker, Boston Computer Society; Rollie Cole, APCUG; Mary Dolce, Chicago Computer Society; Sandy Frunzi, Las Vegas PC User Group (LVPCUG); Al Harrison, Houston Area League PC Users; David Hoffman, NYPC; Joseph Rigo, NYPC; Robert Rodrigue, MicroLink PC User Group; Kenny Wynn, LVPCUG

## PCW COMMUNICATIONS

**PRESIDENT AND CHIEF EXECUTIVE OFFICER** Richard J. Marino  
**PUBLISHER** E. Jefferson Edman  
**VP AND ASSOCIATE PUBLISHER** Bob Carrigan  
**PUBLISHER, PC WORLD ONLINE** Thomas Gewecke  
**SENIOR VP AND CHIEF FINANCIAL OFFICER** Vicki Peilen  
**VP, CIRCULATION** Shawne Burke Pecar  
**VP, HUMAN RESOURCES** Richard Willoughby  
**VP, MANUFACTURING** Linda Manes Goodwin  
**VP, CHIEF INFORMATION OFFICER** Henri Froissart  
**FOUNDER** David Bunnell  
**FOUNDING EDITOR** Andrew Fluegelman

## HOW TO CONTACT PC WORLD

### SUBSCRIPTION SERVICES

PC World Subscriber Services, P.O. Box 55029, Boulder, CO 80322-5029  
**INTERNET:** [www.pcworld.com/resources/subscribe/customer\\_service](http://www.pcworld.com/resources/subscribe/customer_service)  
**E-MAIL:** [pcwhelp@neodata.com](mailto:pcwhelp@neodata.com)  
**PHONE:** In U.S. other than CO 800/234-3498  
In CO and outside U.S. 303/604-1465  
New orders 800/825-7595

### MAIL AND ONLINE

PC World Editorial, 501 Second St. #600, San Francisco, CA 94107  
**PHONE:** 415/243-0500  
**FAX:** 415/442-1891  
**COMPUSERVE:** go pcworld  
**WORLD WIDE WEB:** [www.pcworld.com](http://www.pcworld.com)  
**E-MAIL:** [letters@pcworld.com](mailto:letters@pcworld.com)

### QUESTIONS AND SUBMISSIONS

Send material electronically to the appropriate online address listed at right or mail it to PC World. Include your name, city, and state in all correspondence. 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. Please note that editors cannot guarantee personal responses to all questions.

**ANSWER LINE:** [answer@pcworld.com](mailto:answer@pcworld.com)  
**BUGS AND FIXES:** [bugs@pcworld.com](mailto:bugs@pcworld.com)  
**CONSUMER WATCH:** [consumerwatch@pcworld.com](mailto:consumerwatch@pcworld.com)  
**FULL DISCLOSURE:** [steve@cranky.com](mailto:steve@cranky.com)  
**GOT A PROBLEM?:** [got\\_a\\_problem@pcworld.com](mailto:got_a_problem@pcworld.com); 415/978-3212; 415/442-1891 (fax, Attn: Got a Problem?)  
**HARDWARE TIPS:** [kirk\\_steers@pcworld.com](mailto:kirk_steers@pcworld.com)  
**HOME OFFICE:** [steve\\_bass@pcworld.com](mailto:steve_bass@pcworld.com)  
**INTERNET TIPS:** [judy\\_heim@pcworld.com](mailto:judy_heim@pcworld.com)  
**LETTERS:** [letters@pcworld.com](mailto:letters@pcworld.com)  
**PCW ADVOCATE:** [advocate@pcworld.com](mailto:advocate@pcworld.com)  
**SPREADSHEETS:** [john@j-walk.com](mailto:john@j-walk.com)  
**UPGRADE GUIDE:** [stan\\_miastkowski@pcworld.com](mailto:stan_miastkowski@pcworld.com)  
**WINDOWS NT:** [nttips@spanbauer.com](mailto:nttips@spanbauer.com)  
**WINDOWS TIPS:** [pcwsdunn@aol.com](mailto:pcwsdunn@aol.com)  
**WORD PROCESSING:** [george\\_campbell@pcworld.com](mailto:george_campbell@pcworld.com)

### NEW PRODUCT ANNOUNCEMENTS

Please address press releases to *New Products* at PC World, or call 415/978-3212.

### 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 612/582-3810.

### BACK ISSUES

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 55029, Boulder, CO 80322-5029.



Northwest WorldPerks Member,  
Helen West,  
Procurement Administrator,  
Carmel, Indiana



**Used connections.**



**Used ConnectFirst.<sup>SM</sup>**

***Free First Class upgrade,  
plus 1,000 Bonus Miles.***

Some people think you need the kind of connections that come with wealth or fame to get special treatment on an airplane. But on Northwest, all you need is a ConnectFirst fare.

Northwest Airlines ConnectFirst offers a free upgrade to First Class upon making your reservation plus 1,000 WorldPerks Bonus Miles roundtrip when you take a qualifying connecting flight at a full Coach fare.

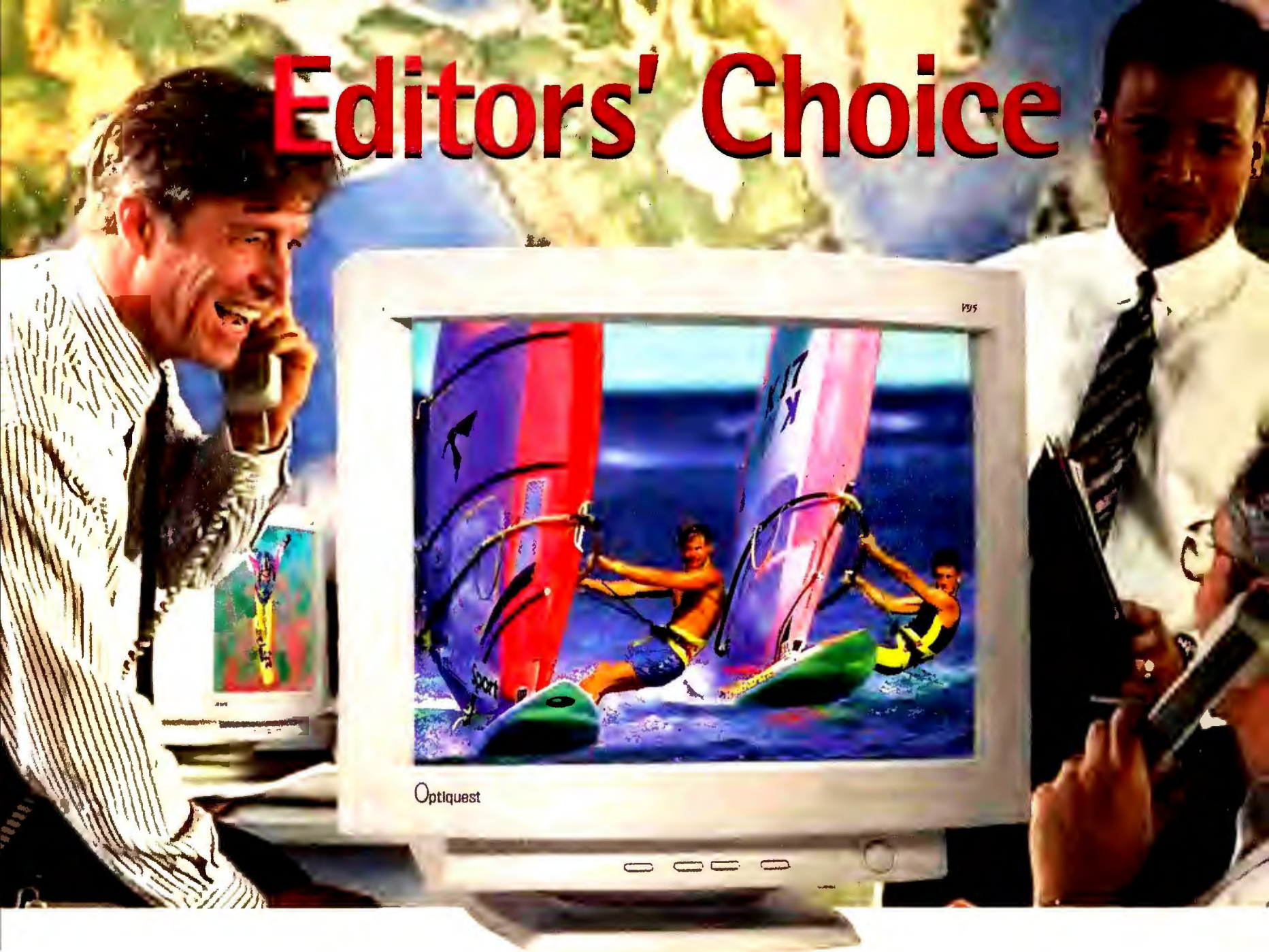
Make the right connections. Call Northwest at 1-800-225-2525, book online at [www.nwa.com](http://www.nwa.com) or call your travel agent and ask for a ConnectFirst fare.



1-800-225-2525 [www.nwa.com](http://www.nwa.com)



# Editors' Choice



## Your Choice

*"Optiquest® bills its monitors as consistent performers for reasonable prices, and the excellent Optiquest V75 and V95 bear this out. Both are among the best in their respective size classes and perform handily in a wide variety of applications."*

*PC Magazine, October 6, 1998 – page 202*

It's one thing for a company to claim its products are the best. But when a publication like PC Magazine honors it with their respected Editors' Choice, you sit up and take notice. Optiquest took the concept of a large screen monitor, combined it with a small footprint, and designed a winner – the 19" (18.0" viewable) **V95**.

Imagine! A screen image large enough to handle business, graphics, gaming and Internet applications for PC and Mac® environments, yet small enough to fit into the footprint of a 17" (various viewable) monitor.



Optiquest V95  
October 1998

Backed by a limited 3/3/3 year warranty (3 years on CRT, parts and labor) the Optiquest V95, V75 and V115 all offer impressive performance with their super fine 0.26mm dot pitch for sharp, crisp images; OnView® controls for simple on-screen *Plug & Play* ⚡ adjustments; for easy installation with Windows® 95 and Windows® 98 and TCO and Energy Star® compliant for power efficiency – all this and more at the affordable Optiquest price.

Why settle for less? The Editors' choice should be your choice in size, performance and price. Call **800-843-6784**, ask for agent 91364 to obtain the name of the dealer nearest you.

**All decisions should be this easy!**

	V75	V95	V115
Size/Viewable	17"/16.0"	19"/18.0"	21"/20.0"
Dot Pitch	0.26mm	0.26mm	0.26mm
Max. Resolution	1600 x 1200	1600 x 1280	1600 x 1280
Optimal Resolution	1280 x 1024 @ 89Hz	1280 x 1024 @ 88Hz	1280 x 1024 @ 88Hz



## Optiquest®

OPTIMIZE YOUR IMAGE™

(800) 843-6784 • (909) 869-9216

Internet: [www.optiquest.com/pcworld](http://www.optiquest.com/pcworld)

Corporate names and trademarks stated herein are property of their respective companies. Specifications subject to change without notice. Copyright © 1998, ViewSonic Corporation. All rights reserved. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation in the U.S. and other countries.



# Needed in PCs: Less Noise

PERSONAL COMPUTERS CONTINUE to improve at a breakneck pace. Clock speeds are pushing 500 MHz. Prices for well-configured systems are breaking the \$1000 barrier. And specifications for future machines promise continued blazing progress. For a comprehensive survey of the PC's bright future, read Michael Desmond's "Your PC in the New Millennium" on page 104.

Already we can glimpse the future in the new crop of sub-\$1000 LCD monitors for desktop PCs, and a wider selection of flat displays is on the horizon. Candescent Technologies is building a factory in San Jose to make what it calls ThinCRTs—8mm-thick displays with separate microscopic electron guns for every pixel.

Reflective semiconductors may also figure in future monitors. These technological marvels make pixels by bouncing light off microscopic mirrors on the surface of silicon chips. The leader is Texas Instruments with its digital micromirror device, already common in presentation projectors. Other contenders include Silicon Light Machines with its grating light valve technology, and Colorado Microdisplay with its DNLCOS (dynamic nematic liquid crystal on silicon). Whichever technology wins, the triumph of flat displays seems assured. The elegance of their design will call for other changes.

## FLAT SCREENS WANT FLAT SPEAKERS

PUT BESIDE FLAT DISPLAYS, today's fat speakers look like guests at the wrong party. Affordable flat speakers are beginning to appear; the most intriguing employ NXT technology from New Transducers in the United Kingdom. The radical design features flat panels ranging from 3mm to 25mm thick that vibrate randomly rather than moving like pistons. They require no enclosures. Other possibilities for flat speakers include cost-reduced versions of older technologies such as ribbons and planar magnetics. PC speakers using NXT flat panels are already available from several companies, including NEC, Gallant Computer, Kodel, and Benwin. Harman International is a major American licensee of NXT technology. Planar magnetic speakers are available from Monsoon Audio Systems. May the best sound win!



A five-fan PC has no more chance of landing in a family room than a B-29 bomber—and is almost as noisy.

But neither the look nor the sound of speakers will matter if the PC itself drowns them out. When trying out new flat speakers on a system at home, I could draw few conclusions because of noise from the PC's two fans. Despite the obvious problem, noise draws little mention in Intel's and Microsoft's specs for future PCs. Intel's "Anywhere in the Home" literature says nothing about noise, and Microsoft's OnNow specification focuses on quieting the PC while it sleeps. The mundane problem of minimizing fan noise is clearly a low priority for industry leaders. Do they think information appliances must sound like dishwashers or refrigerators?

Regardless, fan noise is more than a nuisance. It interferes with any activity requiring close attention to sound. This limits the uses of the future PC in both home and business. Watching DVDs and listening to music require clear sound. So will the use of Internet telephones and videoconferencing systems. The industry would do well to heed the admonition given in *Peter Pan*: "A little less noise there!"

## LIKE A B-29-OR WORSE

THE OPPOSITE SEEMS to be happening. Since microprocessors get hotter as clock speeds rise, PCs inevitably require more cooling, not less. One new Katmai-equipped PC will have four fans, matching the number of propellers on an old B-29 bomber.

The fans, noise and all, don't keep me from wanting the Katmai system. I might even add a graphics card that carries yet another fan. But fan noise would limit the system's use. The noise level would be acceptable only underneath the laser blasts, engine roars, and crowd noise of computer games. The five-fanner would be too loud beside an office desk, and it would have


no more chance of landing in a family room than a B-29.

Most of us can't do much about PC noise. Few will sacrifice speed for silence, or surround our systems with acoustic baffles in decorator colors. The do-it-yourselfer has not yet been born who will move the PC's fans outdoors and run an air duct inside the building to the machine. Products like the HushKit from Silent Systems can help, but not many users will personally replace power supplies. The noise cancellation technologies used in special headphones on airplanes may hint at a solution.

One thing is coming through loud and clear. If the vaunted technical geniuses of the computer industry can't solve the noise problem, the barrier to wider use of the PC may be measured not in megahertz, megabytes, or dollars, but in decibels.

Phil Lemmons is editorial director of PC World.





Berlin?

Beijing?

Bimini?

Barstow?

© 1998 3Com Corporation. All rights reserved. 3Com, the 3Com logo, Megahertz and XJACK are registered trademarks, and *More Connected* is a trademark of 3Com Corporation. Spectrum is a registered trademark of Spectrum Information Technologies, Inc. \*Capable of receiving downloads at up to 56 Kbps and sending at up to 34.2 Kbps. Due to FCC regulations on power output, sending could be limited to 53 Kbps. Actual speeds may vary. Requires compatible analog phone line and server equipment. See [www.3com.com/56k](http://www.3com.com/56k) for details.

*More Connected*  
Spectrum Connected™





**3Com Megahertz**

are connecting  
wherever they

go, whenever they get there.

Whether they're connecting over telephone lines or networks, there's nothing more dependable than 3Com Megahertz PC Cards. They include our Exclusive Line Probing technology, which compensates for phone line

(You never know where it's going.)

But you always know how it's working.

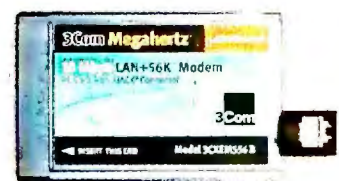
### 3Com Megahertz PC Cards

*Exclusive Line Probing technology.*

*Integrated XJACK® connector.*

*Faster 56K\* connection over standard phone lines.*

*Guaranteed industry standard compatibility.*



impairments to deliver increased V.90 modem performance; and the unique XJACK® connector, which eliminates the need for extra cables.

For details and a white paper brief on our Exclusive Line Probing technology visit us on the Web at [www.3com.com/mobile/elp/pcwd](http://www.3com.com/mobile/elp/pcwd). And learn why our PC Cards ensure reliable performance that take your mobile workers farther than ever.

**3Com**® More connected.™





**Yesterday, you  
needed all this.**



Completing your work just got easier thanks to the HP All-in-One.

Now, in one product, you get a professional quality printer, scanner, copier, and in some models a fax machine too.

So instead of wasting your time managing multiple products, the HP All-in-One helps you get your work done faster and more efficiently.

Every HP All-in-One is engineered for years

of reliable performance and backed by award-winning HP Customer Care and a one-year warranty.

Rather than using up all your desk space with four separate machines – get the one machine that does it all.

The HP All-In-One. Dependable. Easy to use. Designed to work smoothly with no compromise in quality or performance.

**Today, this is all  
you need.**

**The reliable HP All-in-One does it all:  
Prints, Scans, Copies and Faxes.**



Available at

**STAPLES**

[www.staples.com](http://www.staples.com)

[www.hp.com/go/all-in-one](http://www.hp.com/go/all-in-one)

 **HEWLETT  
PACKARD**  
Expanding Possibilities

©1998 Hewlett-Packard Company



## YOUR TAKE ON: Stolen software ♦ Apple's iMac ♦ Our cranky columnist

## COUNTERFEIT SOFTWARE

CHRISTINA WOOD's article ["Is Your Software Stolen?" December] was an eye-opening exposé of the seedy underworld of mass counterfeit-for-profit operations. But it neglected one key reason why such a big market exists for these stolen goods: People have concluded that the "fair market value" of legitimate software isn't fair. I hear this argument with increasing frequency: If a company charges money for buggy crashware that cannot do what it's supposed to do with reasonable reliability, who is stealing from whom?

Every "End User License Agreement" I've seen declares that the vendor is unconditionally excused from any and all responsibility for the quality of its software. Unless users can get better assurance that the higher price of legitimate software buys real, functional value, the pirates will flourish. Yes, strictly speaking, what they're doing is illegal. So was dumping all that tea into Boston Harbor.

*Michael Evans, Los Angeles*

## PC RELIABILITY AND SERVICE

THE USER SURVEY for your November cover story on PC reliability and service could have told the world some very useful things and addressed some serious industry problems. Unfortunately, the star system it used to analyze the data is simplistic to the point of being seriously misleading, since the number of stars means something very different in each category. Though you give no information on the number of responses in each statistical cell, nor a margin of error based on that sample size, my statistical intuition suggests that in many categories the differences between the ratings are not statistically meaningful.

I am also left to puzzle over the result that, for example, in the five-star category for home computers, just under 40 percent of the

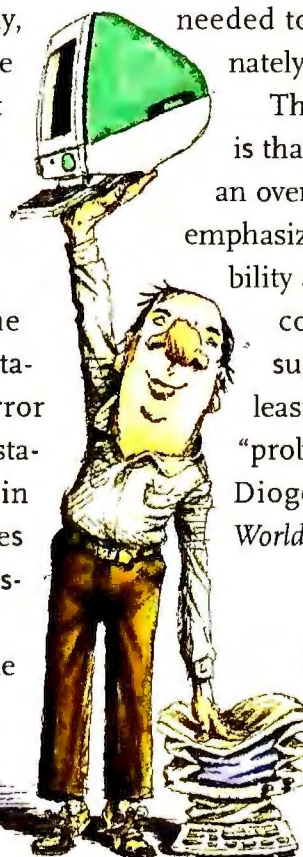
PCs had at least one problem requiring repair, yet in the worst (two-star) category there were less than 3 percent problems per year, leading to the absurd conclusion that the average PC in your survey was about 11 years old. Such discrepancies needed to be addressed, but unfortunately were not.

The saving grace of the article is that none of the systems received an overall five-star rating. The article emphasizes the seriousness of the reliability and service problems, but the cover headline unfortunately suggests that you've uncovered at least one manufacturer that sells a "problem-free" system. Alas, even Diogenes, masquerading as *PC World*, cannot find one.

*Thomas P. Vogl*

*West Tisbury, Massachusetts*

**Editors' response:** Our star rating system is designed to show relative rankings for each company's PC reliability and service. We devised the ▶



## HOT BUTTON

## Thumbs-Down iMac Review Brings Out Apple's Defenders

IN THE ARTICLE criticizing Apple's iMac speed claims ("iMac vs. Pentium: No Points for Good Looks," *Top of the News*, December), your speed comparisons are incomplete. I've seen the iMac blow away a high-performance 400-MHz Pentium II running a Macromedia Director file. It would have been better to do a comprehensive speed comparison, instead of just using three or four programs and then declaring a winner.

*Mitchell Parks, Internet*

THE iMAC IS a consumer product. Speed is not the only important factor; the iMac kills PC boxes in areas like ease of use and troubleshooting. Expansion issues are moot—home users aren't adding extra hard drives or FireWire cards. The iMac is for consumers who want Internet and gaming features.

*Matt Eberly  
Madison, Wisconsin*

YOUR COMPARISON CHART "An Extra \$300 Gets You..." ignores the extras an iMac provides—a built-in 56-kbps modem, infrared port, 10/100Base-Tx ethernet, and USB support, plus real plug and play and MacOS (which is still easier to use than Windows 9x). Out of the box, onto the Internet. "No floppy drive," you protest? Don't tell me you still sleep with a stack of 3.5-inch install disks for Windows 3.1 under your pillow.

*Benjamin J. Mishkin  
Hanover, New Hampshire*

APPLE IS GUILTY of hype when it quotes benchmarks selectively. And the 400-MHz Pentium II was the fastest of the three computers tested. However, for the Photoshop and Quake tests, the performance of the 233-MHz iMac with 64MB of RAM looks similar to that of the 333-MHz Celeron machine with 64MB of RAM. The big difference sur-

faces with Word and Excel. I once compared these programs on identically speed-rated Mac and Windows machines. For many repetitive tasks, performance was equal down to the second. But for other tasks, the Mac was much slower. My conclusion: Anyone who thinks Microsoft would let its Mac versions run as fast as its Windows products probably believes in the tooth fairy.

*John Bevan, Cincinnati*

**Editor's response:** Believe it or not, many of us at *PC World* root for Apple, since consumers would benefit from the competition a stronger Apple would provide. We took Steve Jobs at his word and compared the iMac with the fastest Wintel PC available. It didn't measure up. To be fair, we then compared it with a similarly priced Wintel machine. It didn't measure up. To be extra fair, we added RAM and recompared. The iMac improved, but still fell short. —Bill Snyder



# COMING UP

## IN MARCH

### BANDWIDTH ON DEMAND 1999

More of us are now using demanding streaming audio and video to surf the Web. We give you the best access options: from cable and DSL to satellite and ISDN.

### CHOOSING YOUR ISP

Overwhelmed by your ISP choices? Don't sign up with the first provider that sends you a disk. We tell you whether to go with a national, regional, or local ISP—plus which providers are top-rate.

### FAST 'N' CHEAP WEB SURFING

Are ISDN, DSL, cable, and satellite too pricey or simply unavailable? We check out cheap Web speedup alternatives like caching utilities, modem bonding software, and dual modems.

### THE FUTURE OF NET ACCESS

Three years from now, the Internet's going to be a very different place to surf. You'll have fast enough access for voice and video as well as data. So how do you get there from here?

### ALSO NEXT MONTH

► **The PC World Top 100:** The Top Power Desktops, Budget Desktops, Notebooks, Home PCs, Printers, Monitors, Graphics Boards, and Modems.

► **Low-Cost Servers:** Speedy Xeon processors promise to improve choices for new server buyers. We compare the first wave of Xeon servers to their Pentium II predecessors.

► **Here's How:** *Internet Tips* on avoiding browser upgrade snafus, *Hardware Tips* on surviving your migration to a new PC, *Windows Tips* on rearranging menu items in Windows 98.

# PC WORLD

ratings to point out differences that we think will be significant to PC buyers. When analyzing the raw data, we took into account sample size, statistical correlations, and other standard research tools to come up with ratings that are both valid and meaningful to readers. We chose not to publish all supporting raw data simply because of its sheer volume.

Your confusion about the results for the "Percent of PCs with problems" and "Problems per year" scores is due to our error. The "Problems per year" score is based on a straight number of problems per year, not a percentage, as published. For example, five stars in the Work PCs category was awarded to those companies whose PCs had less than one problem per year on average, as reported by survey respondents.

### KEYBOARD CLEANING: STAY ON THE WAGON

DAVID CHARLAP [*Letters*, December] is incorrect in saying that computer keyboards should be cleaned with alcohol rather than with water. After 30 years of maintaining electronic equipment, I can tell you that if you spill coffee or soda on your keyboard, warm water is the only thing to use. If you clean it with alcohol, you'll be left with a sticky, gummy mess. If your keyboard contains ferrous metals, you should scrap it and get a good one. The bottom line: Don't be afraid to use water to clean your keyboard. Just be sure to let it dry thoroughly before putting it back into service.

Michael A. Bushilla  
Fairfield, California

### FOR STEVE@CRANKY.COM

STEPHEN MANES's *Full Disclosure* column ["Can This Machine Be Stopped?"] in the December issue is full of misdirections and half-truths. Windows 98 is easy to shut down. So is Windows 95. You just need to have installed the operating system on competent hardware with good drivers and application software. The first time you use a bum driver for a device, or a 16-bit driver, or the first time you load your machine with a buggy application that refuses to acknowledge shutdown requests and the like, you create problems

on your system that are *not* the fault of Windows. Blame the poorly skilled application programmer who wrote that nifty genealogy program you like so much, or the game from a company known for producing buggy, incomplete products, but don't blame the operating system.

John Hamilton, *Internet*

I COULDN'T agree more with Stephen Manes. In no other facet of our lives would we live with this lack of "getting it right." And his parting paragraph—that as long as a certain monopoly runs our computers, we can't expect things to get better—hits the nail on the head.

Bruce A. Birr  
Rhineland, Wisconsin

PC World welcomes your responses, ideas, and other letters to the editor. See page 14 for contact information. ■

### CORRECTIONS AND CLARIFICATIONS

IN JANUARY'S "V.90 Modems: The End of the Line," the Best Buy box should have noted that the Zoom Fax/Modem 56K-PCI lacks simultaneous voice-data phone line sharing.

The January *Top of the News* story about Internet Explorer 5 ("IE 5: Looks the Same, Works Better") made an error comparing Netscape's Navigator 4.5 and IE 5; It should have stated that Netscape Navigator 4.5's productivity tools are no match for IE 5's.

A chart in December's "Seven Smartest PC Upgrades for Under \$200" listed the wrong capacity for CD-RW discs; their capacity is 650MB.

The same article gave an incorrect price for the Acer Extensa 367D. Currently, its list price is \$1299.

In December's *Top of the News* story on sub-\$500 PCs, the phone number for PrecisionTec should have been 888/722-8284.

In November's "One Desktop, Two Browsers, 72 Tips," the URL for The Limit Software should have been [www.thelimitsoft.com](http://www.thelimitsoft.com). According to the site, however, Password Memorizer, the shareware product mentioned in the article, is no longer available.

In the same article, the URL for the MTU-Speed utility omitted a hyphen. The correct URL is [www.mjs.u-net.com/mike.htm](http://www.mjs.u-net.com/mike.htm).

PC World regrets the errors.



# Live the experience!

## the Live! experience.



awesome  
**AUDIO**



explosive  
**GRAPHICS**



thrilling  
**PC DVD**



sensational  
**SPEAKERS**



### *It's a totally different way to stimulate your senses.*

The Live! experience is a totally different way to interact with your PC. Our multimedia upgrades take you places you've never been. It's seeing and hearing for the first time. It's being there without ever leaving your seat. It's the adventure of a lifetime. Turn your PC into an extraordinary entertainment center — at an incredibly affordable price.

# CREATIVE®

[www.soundblaster.com/golive/](http://www.soundblaster.com/golive/)

Circle 54 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

1998 Creative Technology Ltd. All brand or product names listed are trademarks or registered trademarks and are property of their respective holders. If you're not on the net, give us a call at 1.800.998.5227 for more information.





BUILT FOR YOU



BUILT FOR YOU



BUILT FOR YOU



BUILT FOR YOU

#### Compaq Presario 5600i-450

**\$2,549** (with Monitor)

- Intel® Pentium® II Processor, 450 MHz
- 13.0 GB UltraDMA Hard Drive<sup>1</sup>
- 128 MB SyncDRAM expandable to 384 MB
- 6X DVD-RDM Drive<sup>2</sup>
- 56K ITU V.90 Modem<sup>3</sup>
- Diamond Viper 550 AGP w/16 MB SDRAM
- Diamond Monster Sound MX300 PCI Audio Card
- Digital Creativity Imaging Center
- 10 Mbps Ethernet Port, Cable Modem Ready
- Iomega Zip Built-In™ Drive
- Microsoft® Featured Home Collection
- Microsoft Windows®9B
- Compaq V910 19" Monitor (18.0" VIA)<sup>4</sup>
- JBL Pro Studio w/Dual Subwoofers (160 watts)

##### Personalize it by choosing:

- 256 MB SyncDRAM: Add \$250
- Presario FP700 Flat Panel Monitor (15.0" VIA): Add \$445

#### Compaq Presario 5100C-400

**\$1,799** Tremendous Value (with Monitor)

- 400 MHz AMD-K6®-2 processor with 3DNow!™ Technology
- 8.0 GB UltraDMA Hard Drive<sup>1</sup>
- 128 MB SyncDRAM expandable to 384 MB
- 5X DVD-RDM Drive<sup>2</sup>
- 1.5Mb Max Digital Modem<sup>3</sup>
- 2X AGP Graphics w/8 MB SGRAM
- 10 Mbps Ethernet Port, Cable Modem Ready
- Iomega Zip Built-In™ Drive
- Microsoft Office 97 Small Business Edition
- Microsoft Windows98
- Compaq V720 17" Monitor (15.9" VIA)<sup>4</sup>
- JBL Pro Speakers

##### Personalize it by choosing:

- 12.0 GB UltraDMA Hard Drive:<sup>1</sup> Add \$120
- JBL Pro Premium Speakers w/Subwoofer: Add \$69
- Iomega Zip Media 10 pack: Add \$99<sup>5</sup>

#### Compaq Presario 5100C-350

**\$1,499** Tremendous Value (with Monitor)

- 350 MHz AMD-K6-2 processor with 3DNow!™ Technology
- 10.0 GB UltraDMA Hard Drive<sup>1</sup>
- 128 MB SyncDRAM expandable to 384 MB
- 5X DVD-RDM Drive<sup>2</sup>
- 56K ITU V.90 Modem<sup>3</sup>
- 2X AGP Graphics w/8 MB SGRAM
- 10 Mbps Ethernet Port, Cable Modem Ready
- Microsoft Featured Home Collection
- Microsoft Windows9B
- Compaq V720 17" Monitor (15.9" VIA)<sup>4</sup>
- JBL Pro Speakers

##### Personalize it by choosing:

- Iomega Zip Built-In™ Drive: Add \$99
- 1.5Mb Max Digital Modem:<sup>3</sup> Add \$99
- Tripp Lite Super 7 + Tel Surge Protector: Add \$29<sup>6</sup>

#### Compaq Presario 1800-300

**\$2,699 - \$100 mail-in rebate\*\***

**\$2,599**

- Intel Pentium II Processor, 300 MHz
- 13.3" TFT Active Matrix Display
- 4.0 GB UltraDMA Hard Drive<sup>1</sup>
- 64 MB SyncDRAM expandable to 160 MB
- 512 KB L2 Pipeline Burst Cache
- 2nd-Generation DVD-RDM Drive<sup>2</sup>
- 56K ITU V.90 Modem<sup>3</sup>
- 256-bit Accelerated Graphics w/2.5 MB VRAM
- Smart Lilon battery
- Microsoft Featured Home Collection
- Microsoft Windows98

##### Personalize it by choosing:

- 96 MB SyncDRAM: Add \$100
- 6.4 GB Hard Drive: Add \$200
- Brief Carrying Case: Add \$119

Buy one of these computers and get **50 free hours** on the Net.\* Plus, get a **\$100 rebate** on select Compaq Presario notebook PCs by signing up for this Compaq Easy Internet Access free trial.\*\*

All prices shown are Compaq Direct selling price after applicable rebate. Prices shown do not include applicable sales tax and shipping. Products and prices valid in U.S. only. Actual retail price may vary. Specifications and prices are subject to change or cancellation without notice. Not all Compaq Presario models available in all retail stores. \*50 free hours of Internet access is offered when Compaq Easy Internet Access is chosen from Compaq Internet Setup. Valid only on selected Presario minitower, desktop, and notebook models. For select minitower, desktop, and notebook models: the 50 free hours must be used over a 30-day period from initial setup. A valid credit card is required to initiate service, although no charges will be incurred until the 50-hour trial has expired. \*\*\$100 mail-in rebate from Compaq upon activation of this free trial of Compaq Easy Internet Access. Rebate offer valid only in the USA and expires 4/30/99. See rebate coupon included with product for additional terms and conditions. <sup>1</sup>Monitor shown is Presario MV700. <sup>2</sup>For hard drives, GB = billion bytes. <sup>3</sup>ITU V.90 modems are designed only to allow faster downloads from K56flex or V.90 compliant digital sources. Maximum achievable download transmission rates are currently unknown, may not reach 56 kilobits per second (Kbps), and will vary with line conditions. <sup>4</sup>G.Lite/56K V.90 updates may be downloaded from the Compaq Web site when available. The G.Lite/56K protocol is designed to allow faster downloads from G.Lite/56K V.90 compliant digital sources. Availability of G.Lite/56K V.90 services will vary by region and Internet Service Provider (ISP), and may differ from V.90 ISP services. Maximum achievable download transmission rates with G.Lite/56K V.90 are currently unknown and may not reach 1.5Mb, and will vary with line conditions and distance. <sup>5</sup>2nd-Generation DVD-RDM Drives run at a higher maximum transfer rate of up to 2.76 MB/s compared to 1st-Generation DVD-RDM Drives which run at a maximum transfer rate of up to 1.34B MB/s. <sup>6</sup>The 5X DVD-RDM Drive transfer rate is up to 6,750 KB/s compared to 1,352 KB/s for 1X DVD-RDM Drives. <sup>7</sup>The 6X DVD-RDM Drive transfer rate is up to 8,115 KB/s. One year parts and labor. Labor for desktop systems is carry-in service with on-site service during the first 90 days of ownership. Labor for notebook systems is pick-up service. Compaq is not liable for editorial, pictorial, or typographical errors in this advertisement. Compaq, the Compaq Logo, and Presario are registered in the U.S. Patent and Trademark Office. Intel and Pentium are registered trademarks of Intel Corporation. Microsoft, MS, and Windows are registered trademarks of Microsoft Corporation. AMD-K6 is a registered trademark and 3DNow! is a trademark of Advanced Micro Devices, Inc. Product and company names mentioned herein may be trademarks and/or registered trademarks of other companies. Call Compaq Monday-Friday 7:00am-11:00pm (CST), Saturday and Sunday 7:00am-7:00pm (CST). ©1998 Compaq Computer Corporation. All rights reserved.





How do I make my personal computer  
really personal?

Easy. Have Compaq build one just for you. Nobody knows what you need in a computer as well as you do. So shouldn't you be the one to decide what goes into yours? When you order these Presario Internet PCs, you're in the driver's seat. You choose how much memory you want, whether or not you want a CD-ROM drive, even the type of monitor you want. Whatever you choose to put in yours, you can rest assured that all our PCs are designed with the latest and greatest Compaq innovations and technology. Just stop by a Compaq *Built For You Custom PC Center* at select retailers, give us a call, or visit our website. Tell us what you want in your computer and we'll build it for you. Bring the world's best-selling computer home today.



Purchase yours at your favorite retailer, or buy direct from Compaq. Visit us at **[www.compaq.com/athome](http://www.compaq.com/athome)** or call **1-800-390-3268**.

Take advantage of Compaq values at any of these qualified retailers: **ABC Warehouse**, American Appliance, American TV, **Best Buy**, Big City Express, **Brandsmart USA**, **Circuit City**, CompUSA, CompUSA Direct, CDW, Computer Town, Conn's, DataVision, Dillard's, Fred Meyer, Fry's Electronics, **Future Shop**, the good guys!, **h.h. Gregg**, Insight, **J&R Computer World**, Micro Center, MicroWarehouse, Multiple Zones, Nationwide Computers & Electronics, **Nebraska Mega Mart**, Nobody Beats the Wiz, **Office Depot**, **OfficeMax**, PC Connection, PC Mall, PC Richard & Son, PC Warehouse, **RadioShack**, RCS Computer Experience, Sears, **Staples**, State Street Discount, Tiger Direct, Tops Appliance City, T-Zone. Visit a Compaq *Built For You Custom PC Center* at the select retailers highlighted above in bold.

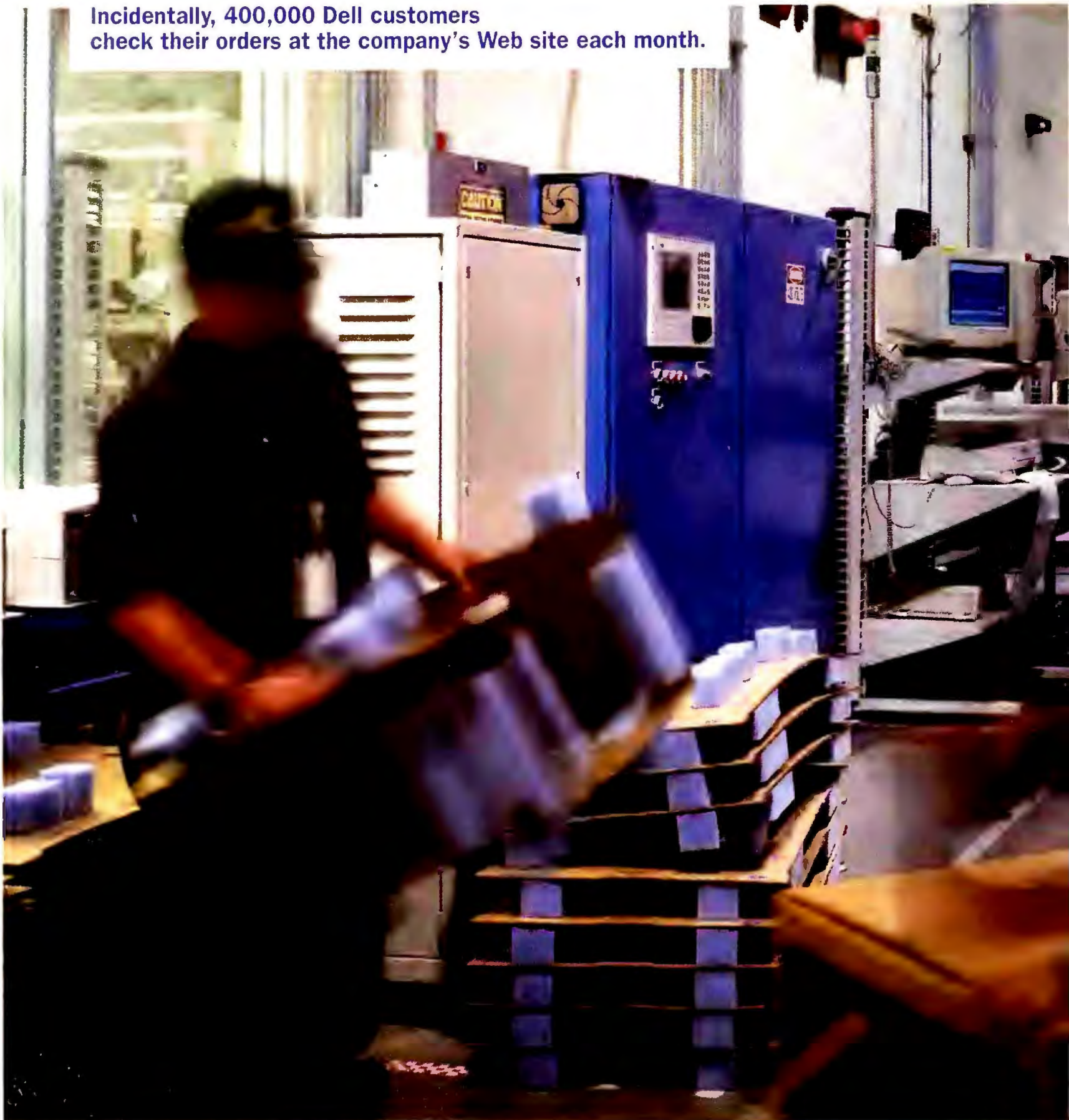
**COMPAQ**  
Better answers.<sup>SM</sup>



**November 3, 1998, 3:06 a.m.**

A Dell customer checks the status of her order at the company's Web site, and finds her answer immediately. Dell gets one happy customer.

Incidentally, 400,000 Dell customers check their orders at the company's Web site each month.



© 1998 Microsoft Corporation. All rights reserved. Microsoft, BackOffice, Windows NT, and Where do you want to go today? are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. Other product and company names mentioned herein may be the trademarks of their respective owners.





A few more examples  
of commerce solutions  
in action:

**barnesandnoble.com**  
offers online shoppers  
split-second searches  
and inventory status  
on millions of books.

**EddieBauer.com**  
features personal  
wish lists, a reminder  
service for important  
dates, and more  
products than their  
largest print catalog

**Starbucks.com** is a  
new way for Starbucks  
fans to experience  
the coffee, company,  
and culture of Starbucks.

Dell built its commerce solution on a Microsoft® platform of Windows NT® Server and the BackOffice® family, because the products scaled easily to meet its growing capacity needs and its \$2 billion in annual online sales. You, too, can quickly build a commerce solution on this scalable, flexible platform starting with many of the systems you already have, along with an industry of partners, to address your specific needs. To find the right partner who can best help you, or to get the free Digital Nervous System: Commerce Solutions CD, visit [www.microsoft.com/dns](http://www.microsoft.com/dns)

**Microsoft®**

Where do you want to go today?



# SAVIN IS WORKING HARD TO BE YOUR NEXT DOCUMENT OUTPUT COMPANY.



At Savin we have one simple goal. To be the one document output company that answers all your document handling needs.

That's why we've been working overtime to bring you the forward-thinking, award-winning technology essential to boosting productivity in today's digital offices. With fast, versatile, connectable digital imaging systems that allow you (or your workgroup) to print, sort, duplex and staple — right from your desktop. And full-color imaging systems that turn electronic documents into brilliant hard copy.



But advanced digital technology is just the beginning. Because at Savin we're working hard on becoming the fastest, most responsive name in the business. With smart, highly-trained Savin professionals who will do whatever it takes to give you the satisfaction and service you deserve.

To find out just what we'll do to be your next — and last — document output company, contact us at 1-800-234-1900 or [www.savin.com](http://www.savin.com).



## **savin**

WE'VE GOT WHAT IT TAKES TO WIN YOU OVER<sup>SM</sup>

SAVIN CORPORATION, 333 LUDLOW ST., STAMFORD, CT 06904



# Will a Y2K Bug Blow Up in Your Face?

*Finding out whether your system can repel the millennium bug may be harder than you think.*



AS THE CLOCK TICKED ever closer to 2000, Jim Reid, a document control supervisor from Florida, had a simple question: Would his two-year-old NEC Ready computer fall victim to the millennium bug? First he checked NEC's Web site but found no mention of his specific PC. Then he sent an e-mail to the company's technical support department and received a terse and rather distressing response: "We do not have a BIOS that will make your computer Y2K compliant. We regret any inconvenience this may cause."

That's when Reid panicked. "Do I throw my machine in the garbage on January 1?" he asked. As it turns out, his situation is less

dire than NEC's first message implied. His model PC hasn't been tested for Y2K compliance, so NEC has yet to decide on a fix. (The technician who answered his first query evidently wasn't aware of this.) In the worst case, he'll have to manually reset the computer's internal date on January 1, 2000. He won't, as he once worried, have to toss out his \$3000 PC.

Reid's uncertainty about his computer illustrates the Y2K problem's potential to strike fear in the hearts of computer users everywhere. With all the press surrounding the issue and the countless gloom-and-doom predictions of an end to life—computing and otherwise—as we know it, tensions are running high.

Some panic is inevitable, given the scope of the problem. But solid information, plus a commitment by vendors to help customers through the maze of compatibility issues, can go a long way toward stabilizing this volatile issue.

## INFORMATION WANTED

NOT SURPRISINGLY, consumers want to get their computing houses in order. Though the "easy solution"—as one industry executive told me—is to buy a new PC and upgrade your software, that fix is not a practical or affordable answer for most of us. The next-best alternative is to figure out whether each product you use is Y2K compliant. (For tips on how to do this, see last month's "2000: The Year of Living Dangerously," [www.pcworld.com/jan99/y2ktips](http://www.pcworld.com/jan99/y2ktips).) This is where hardware and software companies come in. Sure, you can buy a software tool to test your system's exposure to the millennium bug. But shouldn't you be able to get that data from the companies whose products you're using?

Many companies supply updates about their products' Y2K-compliance status on their Web sites. Most major PC companies explain the problem clearly and provide an exhaustive listing of their systems, stating whether each model is compliant and identifying the available fixes. Dell, Compaq, and Packard Bell have especially informative and easy-to-follow online resources. On the software side, Microsoft, Lotus, and Corel offer similar product information. But many other companies haven't addressed Y2K compliance publicly, heightening customers' concerns (some call it hysteria).

To encourage all companies to share Y2K-compliance information with their customers as soon as it becomes available, President Clinton signed the Year 2000 Readiness and



# PC for \$149

## IT'S REALLY TRUE!

### Concurrency is here!

This revolutionary new technology allows you to add a 2nd PC for only \$149 (excluding monitor, keyboard & mouse) to your existing Windows 95/98 PC (100KHz or faster). With our **Buddy system** - internal card installed in the main PC, up to 50 feet of cable and a little connector box, you can hook up a monitor, keyboard, mouse and create a new, completely independent PC.

#### Setup is as easy as 1-2-3

##### Step 1

Place the Buddy expansion card in PC.

##### Step 2

Run the 15 foot extension cable from the PC expansion card to the Buddy connector box.

##### Step 3

Connect the 2nd user's monitor, keyboard and mouse to the Buddy connector box.



### Consider this:

Both PC's can concurrently run any software that you have on the main PC. Use the internet to simultaneously and independently send or receive e-mail or browse the Web, use or share documents and data files, and share one printer, one modem, one hard drive, one of any other hardware or software with the main PC. You only need to upgrade your main PC and instantly get the same benefits on your Buddy system (without buying two sets of PC's and peripherals)!



For order info call

**1-888-654-5415**

visit our website at

**www.vegatechnologies.com**

Circle 248 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

## CONSUMER WATCH

Disclosure Act last fall. Under the new law, any businesses that post Y2K-related information between July 14, 1998, and July 14, 2001, that later proves to be inaccurate cannot be held liable for their error, provided that the misinformation was unintentional.

Such protection seems reasonable. But critics of the new law are justifiably worried that companies will hide behind some vague statement about year 2000 compliance in the event that consumers sue for having received inaccurate or misleading information. (Of the hardware and software company Web sites I visited, Corel's was the only one that specifically cited the new law.)

### SHOULD VENDORS OFFER FIXES?

SHARING COMPLIANCE information with consumers is a crucial first step. But it's not enough for a company to say that a product will not function properly in 2000. The vendor must also tell customers what it plans to do about the problem. Will it offer an upgrade? Are there work-arounds for products that won't be made Y2K compliant? At a minimum, a company that doesn't have a fix should inform customers about the status of its investigation. Consumers need this information to make decisions about when and how to prepare themselves for D Day.

Here's where several companies have run into problems. At this writing, nearly a dozen lawsuits have been filed against hardware and software companies, including Intuit, Micron, Quarterdeck, and Quarterdeck's new parent company, Symantec. The facts in each case differ, but the issues they raise can be boiled down to three questions: Should a software developer or PC maker be obligated to tell its customers if its products are not Y2K compliant? If so, should the company be forced to fix any millennium bugs before the ball drops? And perhaps the knottiest of all, who should pay for these upgrades?

Many companies are scrambling to test products for Y2K compatibility. Others

have yet to decide what type of fix—if any—to make available. One of the best ways to keep up with the latest developments is to visit [www.year2000.com](http://www.year2000.com), which supplies links to year 2000 information on dozens of company Web sites.

Perhaps the knottiest question of all is the one with the price tag attached: Who should pay for these upgrades?

### NO FREE UPGRADE?

SOME INDUSTRY leaders believe consumers should pay to upgrade their systems and software. But hardware and software companies shouldn't use the millennium bug to force a global upgrade on consumers. From where I sit—at an early-model Pen-

tium running software that's two generations old but works just fine, thank you—paying for an upgrade is an unreasonable solution. Why should consumers have to buy new products because of flaws that the manufacturer may well have known about when it released the product?

Corporate responsibility, however, only goes so far. Anyone still using DOS applications—or even Windows 3.1 products—can't realistically expect to be bailed out. Hardware and software companies are too busy fixing newer releases to correct problems in versions of operating systems no one sells any more. But how far back should they go? One year? Two years? Five? The courts haven't spoken yet, but don't hold your breath waiting for companies to fix old software.

Ultimately, companies must share information and, when reasonable, provide their customers with practical fixes. Should those fixes be free? Yes, if possible—particularly in the case of products released after companies had become aware of the Y2K time bomb. At the very least, consumers should be able to get guidance on when and how to correct their system and software.

Anything less is bad business.

*Contributing Editor Roberta Furger is author of Does Jane Compute? Preserving Our Daughters' Place in the Cyber Revolution (Warner Books, 1998). See page 14 for contact information.*



# Feed Your Need!

**For Power... For Performance... For SPEED!!! – with the ActionBook 736T.**

Introducing the next generation of notebooks from UMAX – ready to handle your most demanding multimedia and



internet applications with ease. Available with a high-powered Intel® Pentium® II processor 266 MHz,

the ActionBook 736T also offers accelerated 3D graphics, video-in & video-out ports, a massive hard drive and stunning 3D sound. Extended battery life and a 56K V.90 modem makes it fully equipped and ready to go – anytime, anywhere!

13.3" XGA TFT Active Matrix Display

Intel® Pentium® II processor 266 MHz

## Multimedia Ready ActionBook 736T with Pentium® II processor 266 MHz

Includes  
56K V.90 PCMCIA  
Modem

4 MB  
Video  
RAM

Built-in  
24X CD-ROM  
Drive

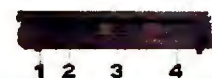
All-in-one Design

Extended Battery Life – Up to 4 Hours!



**CALL FOR MORE INFO!  
888-234-UMAX**

### WITH EXTREME CONNECTIVITY!



- 1 3.5" Floppy Disk Drive
- 2 24X CD-ROM Drive
- 3 IR Port
- 4 PCMCIA Sockets



- 1 Microphone In
- 2 Headphone Out
- 3 PS/2 Type Port
- 4 Serial Port
- 5 Parallel Port
- 6 CRT Port
- 7 Port Replicator
- 8 Video In
- 9 TV Out
- 10 USB Port



**Actionbook 736T – fully equipped and ready to go – anytime, anywhere!**

Model	Speed	Processor	VRAM	Display	RAM	Hard Drive	Cache	Modem	CDROM
736T	266 MHz	Intel® Pentium® II processor	4MB	13.3" TFT	64MB	4.0GB	512K	56K	24X

**UMAX®**  
[www.umax.com](http://www.umax.com)

© 1998 UMAX Technologies, Inc. All rights reserved. ActionBook and UMAX are registered trademarks of UMAX Technologies, Inc. All other brands and product names are trademarks of their respective companies. Intel, the Intel Inside logo and Pentium are registered trademarks and MMX is a trademark of Intel Corporation.

Circle 230 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# Pure Digital Visual Magic



Silicon Graphics 1600SW™ flat panel monitor

## Digital Flat Panel Solution Pack

Number Nine Revolution® IV-FP graphics card



### The Ultimate Digital Flat Panel Solution Pack:

#### Silicon Graphics 1600SW flat panel features:

- Large 17.3 inch Silicon Graphics 1600SW Flat Panel (equivalent to 19" CRT Monitor)
- 1600 x 1024 pixel screen with 16.7M colors
- Unique SuperWide™ display lets you view two pages or applications side-by-side
- Light table image quality: up to 3X brighter than traditional CRTs and up to 5X the contrast
- .23 mm dot pitch (110 dpi) for laser sharp pictures, text and lines
- Ultra fast LCD pixel performance eliminates ghosting of moving graphics and video

#### Number Nine Revolution IV-FP card features:

- 32MB for demanding graphics and textures
- Digital output for stunning image quality
- Fast 2D/3D for Windows 95/98, NT 4.0, and Windows 2000
- Full-featured OpenGL and Direct3D support
- PCI and AGP configurations

**Only \$2795 MSRP.**

Available from Silicon Graphics and Number Nine

Visit [www.sgi.com/go/flatpanel](http://www.sgi.com/go/flatpanel), [www.nine.com](http://www.nine.com) or call 1-888-744-7373 for more information.



**SiliconGraphics**

[www.sgi.com](http://www.sgi.com)



**NUMBER NINE**  
VISUAL TECHNOLOGY

[www.nine.com](http://www.nine.com)

Circle 181 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# Extended Warranties: Worth the Cost?

SHOULD YOU BUY an extended warranty for your PC? James Dodez of Middletown, Rhode Island, doesn't think so. Dodez got a brochure for a General Electric extended warranty when he got his CyberMax PC, but he wasn't happy with the service he bought. He laments, "GE promises

fast, convenient computer service, but dealing with GE isn't convenient and their idea of fast is measured in months." Chip Keeling of GE responds that if a technician comes on-site but can't fix the PC, average repair time is five days. He also says the technician will attempt some troubleshooting on-site.

While warranty terms vary, an extension often buys less than you might expect. At Quantex, for example, extended-warranty techs work for Philips Magnavox. Under the standard three-year warranty, a Quantex tech will troubleshoot problems on the phone and suggest replacement parts. With the extension, a Philips tech will install the part on-site; if the fix doesn't work, you're back to the phones.

Dell, on the other hand, provides its own extended service and trains its on-site

techs. There's no third party involved.

In any case, an extension shouldn't be your first choice when buying a new PC. Instead, buy a system with a three-year original warranty (a common option) that includes one year of on-site service. After that year, if you're scared to do your own repairs—and if you plan to keep the computer for another few years—buy yourself additional on-site service with an extended warranty.

If you purchase your PC with a credit card, check to see if the issuing bank will double the manufacturer's guarantee for no charge.

Regardless of your choice, however, consider whether your money would be best spent on a system that has better expected reliability (see our November 1998 report, "PC Reliability and Service: Who Can You Trust?" [www.pcworld.com/nov98/service](http://www.pcworld.com/nov98/service)).



## Heads Up...



ONE READER LUCKY enough to have @Home's cable modem service was told during his first tech support call that he'd have to pay \$35 for his next. True, says an @Home rep, but the first call is free and the next costs only if the caller caused a problem that requires support to reinstall service... I got a couple of letters alleging false advertising by PC maker **Unicent Technologies**. The company's Web site ([www.unicent.com](http://www.unicent.com)) claimed tech support hours of 8 a.m. to 10 p.m. EST, but support is actually open only until 8 p.m. A Unicent spokesperson explains that hours changed on October 1. The Web site is now fixed... According to the U.S. Bankruptcy Court, **JTS Corporation**, a hard drive maker in San Jose, California, has filed for involuntary Chapter 7. Unfortunately, I was unable to locate a trustee for the case. Stay tuned for further details... **Storm Technology**, makers of popular scanners, recently filed voluntary Chapter 7. Jerome Robertson, bankruptcy trustee, says that "the likelihood [that another firm will honor Storm's rebate or provide warranty repair service] is zero." Though customers can file claims at the bankruptcy court in San Jose, Robertson states that due to ongoing litigation it may be two to three years before claimants see any results—if they ever do.

## LETTER OF THE MONTH



I'D APPRECIATE ANY help you can give me in my effort to get Toshiba to live up to its warranty obligation. My problems started in June 1998 with the disk drive in my Toshiba laptop and desk station. Since then, I've hauled it to a Toshiba repair center and shipped it twice to a repair facility with no luck. I've asked Toshiba for a replacement, but haven't gotten it.

—David F. Brown  
Bellingham, Washington

**PC World responds:** I contacted Toshiba on Brown's behalf and asked the company to replace the part or the notebook, as the warranty recommends. A spokesperson told me Toshiba would indeed replace Brown's laptop. In fact, the company went one step further and replaced it with an upgraded model.

A Tecra 730 was sent to replace Brown's Tecra 720; unfortunately, the new unit Brown received had a broken CD-ROM drive, which Toshiba says it will fix.

## GOTTEN A RAW DEAL?

Or a great one? Send On Your Side the details at [onyourside@pcworld.com](mailto:onyourside@pcworld.com). We will investigate complaints and publish items of the broadest interest. Christina Wood is a contributing editor for PC World.



# Staying Ahead of the Competition



## EVEREX STEP® SERVERS...

### Everex StepServer™ ES

is the Enterprise Server Leader

Step up to the top level of enterprise server speed, and give your client desktops rapid access to business-critical, enterprise-wide database applications. Combining the power of quad Intel® Pentium® II Xeon™ processors 450 MHz with full-speed L2 cache and supporting up to 4GB of memory on a 100 MHz ECC protected system bus, the

StepServer™ ES is far in front of the pack in the enterprise server platform race.

### Everex StepServer™ CS

is a Brutally Fast Departmental Server

Step up to a new level of departmental server speed, and quickly give your client desktops the departmental information they need to continue your business growth. Combining the power of dual Intel® Pentium® II processors 450 MHz supporting

up to 1GB of SDRAM on a 100 MHz ECC protected system bus, the StepServer™ CS leads the pack in the departmental server platform race.

For details call **1-800-EVEREX-1** or 510-498-1111 • Visit our web site at [www.everex.com](http://www.everex.com)

The Intel Inside logo, Intel, and Pentium are registered trademarks and Xeon is a trademark of Intel Corporation in the United States and other countries. STEP and StepServer are trademarks of Everex Systems, Inc. All other trademarks used herein are the property and/or registered property of their respective owners. Specifications are subject to change without notice. © 1998, Everex Systems, Inc. All rights reserved.

**Circle 107 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)**



# Home Networking Without the Network

**PROBLEM** *You want to share files between two PCs without the expense and hassle of a full-blown LAN.*

**SOLUTION** *Make a simple, efficient connection by using low-cost cables and a Windows utility.*



THE NUMBERS SPEAK FOR THEMSELVES: More than 15 million households have at least two computers, not counting the millions of company laptops used at home for after-hours work. So it's no surprise that companies such as Diamond Multimedia, Net-Gear, and Intelogis are introducing networking kits aimed at home users. But these kits aren't cheap—a two-PC setup can cost \$200 to \$300—and they're overkill for people with modest needs.

Take Dale Johnson, for example. Johnson, who videotapes weddings and other social events for a living, uses two Compaq Presario

desktops for his home-based business. He wanted to link the two PCs so he could store mirror images of vital data on both hard drives.

"I didn't look very hard at a network because I didn't know much about it, and I knew it meant adding another card to my machine," says Johnson. He found an alternative in Direct Cable Connect, an applet included in Windows 95 and 98. DCC lets a PC access another system's disk drive over a serial or parallel cable, creating a dirt-cheap (albeit slow) mini-network.

## MAKE THE CONNECTION

THE ONLY HARDWARE you need to support DCC is a \$10 serial or \$30 parallel file-transfer cable to connect two systems. After establishing the link, you can use the PC you're working at to access the other system's drives through Windows Explorer or within apps. Besides its usefulness for quick-and-dirty networking, this capability is a lifesaver for installing software onto a laptop that lacks a CD-ROM drive—just connect the notebook to a PC that has such a drive.

Once set up, DCC is simple to use, but configuring it requires several steps. In many cases, you'll need to install DCC from the Windows 95 or 98 setup disc. Put the Windows CD-ROM into the CD-ROM drive, and click *Start•Settings•Control Panel*. Double-click the *Add/Remove Programs* icon, and click the *Windows Setup* tab in the dialog box. In the scrolling list, click the *Communications* item and then click the *Details* button. Click the check box next to *Direct Cable Connect* to select this option. Click *OK* to start the installation. Repeat this procedure for each PC you wish to connect.

To make data available to other PCs, you must tell Windows to share drives with other machines. The PC whose drives you want to share is the *host*; the one accessing them is the *guest*. On the host PC, right-click the *Network Neighborhood* icon on the Desktop and select *Properties*. On the Configuration sheet, click *File and Print Sharing*; then, in the resulting dialog box, check *I want to be able to give others access to my files*.

Now tell the host system which drives you want to make available to the guest. On the host PC, right-click each drive icon in Explorer or My Computer and click the *Sharing* menu item. In the Sharing sheet of the drive's Properties dialog box, click the *Shared As* button and enter a name for the drive in the Share Name box. Repeat this set of steps for every drive you want the guest system to access. ►



# AnthroCarts!®

Built like tanks with a Lifetime Warranty!



Configure Them for *Your* Application • Tough as Nails  
Dozens of Shapes and Sizes • Over 75 Accessories • Order Direct!

Call for a free Catalog:

**800-325-3841**

6:00 AM to 6:00 PM PST, M-F



**Anthro Corporation®**  
**Technology Furniture®**  
Tualatin, OR 97062  
Fax: 800-325-0045  
Japan: 03 (Tokyo)-3947-2735  
[www.anthro.com](http://www.anthro.com)



Since 1984. Prices from \$299. GSA contract. Available for OEM applications.

## GOT A PROBLEM?

Next, connect the PCs. Although serial cables are cheaper, a fast parallel cable works much better for installing software or moving large files over the wire. Just make sure you use a bidirectional parallel cable—older ones may not work.

Finally, launch DCC on both PCs (from the Start menu's *Programs•Accessories•Communications* folder), and identify the host and guest machines. Once the connection is made, launch Windows Explorer on the guest PC and choose *Tools•Map Network Drive*. Use the drop-down Path list to select a drive on the host machine. Repeat the process to map other drives. From then on, just connect the PCs and launch DCC. The host's shared drives will appear as local drives on the guest PC, and they can be used with Windows Explorer and other file-management tools.

DCC won't win any awards for speed: A 2MB file can take about 30 seconds to copy over a parallel cable, while a serial transfer may take nearly three times as long. "I'll click and drag to have the program start transferring, and I'll go and do something else," says Johnson, who moves about 120MB of data across a parallel cable once a week. "The time is not that big a concern to me."

### NO LAN PANACEA

DALE JOHNSON'S work-around isn't for everyone. The more often you need PC-to-PC connectivity, the more you'll benefit from the speed of a real network. If your systems have free slots, you can set up a two-PC Ethernet LAN for less than \$100, though configuring it can be tricky. And unlike a full-fledged LAN, Direct Cable Connection doesn't provide a practical way to share a printer between two PCs. (Johnson manages the task of sharing one ink jet printer between his two systems by using a cable-switch box setup.)

Still, Johnson likes his setup. "It's a bit of a spider web to have all those cables set up," he says. "But it's very functional and easy to use. You don't have to crawl under the table to switch the cable around."

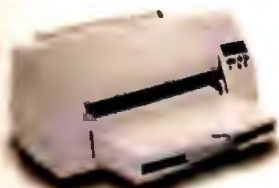
*Michael Desmond is a Vermont-based contributing editor for PC World. See page 14 for contact information.*



*"Location, location, location. With all our different offices, we need a choice of color printers."*



Optra Color 40



Optra Color 45



Optra  
SC 1275



Optra Color 1200

NOT EVERY OFFICE NEEDS THE SAME THING IN A COLOR PRINTER. WHICH IS WHY WE CREATED THE LEXMARK OPTRA™ COLOR FAMILY OF PRINTERS. FOR THOSE WHO WANT TO PRINT FAST, WE CAN PRINT UP TO 12 COLOR PAGES A MINUTE. AND IF YOU WANT TO PRINT WIDE, WE CAN DO THAT, TOO. ALL AT A RESOLUTION OF 1200 DPI QUALITY, WITH FEATURES THAT MAKE HOOK-UP AND NETWORKING EASY. AT PRICES AS LOW AS \$449.\* THE FACT IS, WE'VE GOT A PRINTER TO FIT YOUR BUDGET, YOUR PEOPLE, YOUR NEEDS. EXACTLY.

YOU TOLD US YOU WANT TO PRINT QUICKLY, CLEARLY, EASILY AND INEXPENSIVELY – JUST AS YOU DO IN BLACK & WHITE. WITH THE BRILLIANCE OF VIVID COLOR. SO OUR OPTRA COLOR FAMILY DOES JUST THAT. CALL 1-800-LEXMARK (1-800-539-6275) OR VISIT US AT [WWW.LEXMARK.COM/E/](http://WWW.LEXMARK.COM/E/) TO LOCATE A COMPETITIVE COMPARISON. *EXACTLY WHAT YOU WANT...IN PRINT.*

**LEXMARK**

©1998 Lexmark International, Inc. All rights reserved. \*Estimated street price. Prices may vary. Lexmark, Lexmark with diamond design, and Optra are trademarks of Lexmark International, Inc. registered in the United States and/or other countries. Other trademarks are property of their respective owners.

Circle 141 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

COLORFUL PEOPLE FOR LEXMARK



# WWW.MICROC

Starring

## ZPC

300MHz Cyrix MII MMX Processor  
512K Onboard Pipeline Burst Cache  
32MB SDRAM  
3.2GB Ultra-DMA Hard Drive  
12x Multimedia CD-ROM  
33.6 Fax Modem  
1.44 Floppy Disk Drive  
2MB PCI Video Card  
14" .28 1024x768 Color Monitor  
Windows 104 Key Keyboard  
2-Button Combo Mouse  
Microsoft Windows98 w/CD  
2 Year Parts and Labor Warranty

# \$499





# WORKZ.com

Featuring

## **The Workz**

350MHz AMD K6-2 3D Now! MMX Processor

1024K Onboard Pipeline Burst Cache

64MB SDRAM

8.4GB Ultra-DMA Hard Drive

36x Multimedia CD-ROM

16bit DirectSound 3D Full Duplex Sound Card

Twin Amplified 3D Stereo Speakers

2 x USB - 1 Game Port

K56 v.90 Voice/Data/Fax Modem

1.44 Floppy Disk Drive

8MB AGP Video Card

15" .28 1024x768 Color Monitor

Windows 104 Key Keyboard

2-Button Combo Mouse

Microsoft Windows98 w/CD

2 Year Parts and Labor Warranty

# \$850

**technology so advanced, it's simple.**

Circle 169 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

**ORDER DIRECT**

**Toll Free or Order Online**

# 1-888-538-5791

# WWW.MICROWORKZ.com

14324 Lake City Way NE ~ Seattle, WA 98125

©1998 Microworkz Corporation. All Rights Reserved. Offer and availability is based on the current price and stock availability. Pricing subject to change without notice.



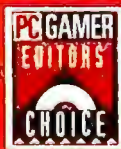
# Welcome to All-In-Wonder Land

ATI ALL-IN-WONDER PRO

The ultimate upgrade card for maximum family fun

## ALL-IN-WONDER PRO

- Just one card inserted in one slot does it all - 8MB of memory, incredible 3D action, "intelligent" TV on your PC, DVD video playback, still and motion video capture, TV-set display, rich and fast 2D graphics - and more
- Digital VCR with video compression that lets you save your favorite TV or video on your PC
- Enable Web TV for Windows 98 and experience interactive TV on your PC
- The only all-in-one, complete PC upgrade solution is ATI All-IN-WONDER PRO
- Check out our site at [www.atitech.com/ad/wonder](http://www.atitech.com/ad/wonder) to see cool ways to use your All-IN-WONDER PRO
- Includes a valuable software bundle featuring MGI VideoWave video editing software and cool 3D games



*The New Breed of Speed.*

<http://www.atitech.com/ad/pcwld>



© Copyright 1998, ATI Technologies Inc. ATI and ALL-IN-WONDER PRO are trademarks and/or registered trademarks of ATI Technologies Inc. All other company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. DVD playback requires AGP version.



# I Declare War on Telemarketers

"HI, THIS IS Stan. How are you today?" Oh, jeez, another intrusive telemarketer calling, shattering a brilliant thought. (Now where was I?)

"I'm terrific," I responded. "Can you hold a sec?" With a home phone and two business lines, I'm inundated with these calls. But this time, instead of following my usual modus operandi—saying something obscene in COBOL and hanging up—I turned to my PC and loaded Enigma. This slick program helps me thwart telemarketers and keep them from calling back. Best of all, it's free.

"What's the name of the company you're calling for?" I asked, reading from the monitor (and ignoring the mangled prose).

"San Gabriel Register," he said cheerfully. (Yep, I made up that name to protect the obnoxious telemarketer and keep me out of court.)

"Cool," I said supportively. "Could you please tell me your full name, Stan?"

Pause.

"Don't be shy," I prompted, a grin on my face. This was going to be fun.

"Did you know," I added, "the Federal Trade Commission says that a person or entity making a telephone solicitation must provide the full name..."

"Stan Schmendrick," he interrupted.

"Thanks, Stan," I said. "You realize that telemarketers have to keep and maintain a 'Do not call' list? And they can't call again for ten years?"

I stifled a giggle. See, just hanging up on the guy would get me nowhere. But



Just hanging up gets me nowhere. But with Enigma on my PC, I feel like the Telemarketer Terminator.

with Enigma on my PC, I felt like the Telemarketer Terminator. The program prompts me with eight precise questions based on the Telephone Consumer Protection Act, along with the text of the law. I ask each question, wait for the telemarketer to squirm, fill in the response, and keep a log. Simple. And I swear, it works.

"Can you wait a minute?" asked Stan, sounding like he'd swallowed his toothpick. I heard his headset hit the desk.

It gets better. If the company calls again within 12 months, you can sue for up to \$500 per violation. Nice. They must have a "don't call" written policy (no? the fine could be a whopping \$10,000), and then the FTC may hit them for another somewhat paltry \$500 if they don't send you a copy. Fun, huh?

The entire regulation is on the FTC site, [www.ftc.gov/telemarketing](http://www.ftc.gov/telemarketing). Better, visit the exhaustive Karen's Concepts Anti-Telemarketer & Anti-Spam Page at [www.netmegs.com/koncepts/telemark.htm](http://www.netmegs.com/koncepts/telemark.htm). You can grab a copy of Enigma at [www.verinet.com/~geoff/Enigma](http://www.verinet.com/~geoff/Enigma) or from PC World Online at [www.fileworld.com](http://www.fileworld.com).

Stan's supervisor came on the line. She took my number and promised not to call again (for ten years, pal).

## THIS CALL'S FOR YOU

I HAD SUCH a good time tormenting Stan that I decided to get Caller ID and screen all my calls. (Don't worry, Mom, your tech support calls will still get through.)

Instead of buying a cheapie Caller ID gizmo, I splurged on Nortel's Meridian 9617, a two-line phone that connects directly to my PC's underused USB port. At \$330, the Meridian isn't cheap, but its features make the price tag easier to swallow.

With Caller ID, the Meridian pops information about each incoming call onto my PC screen. Most local telemarketers don't block Caller ID, so once I have their numbers, I tell the phone to reject their calls. I've also set the Meridian to play different .wav files on my PC based on the caller's ID, so I can tell when my editor's calling by the sound—for example, the braying of a mule.

I can seamlessly conference two callers using the Nortel PC software or tell the phone to page me when I'm out of the office. Easily the coolest function is Meridian's Voice Dialer. It lets me place a call by saying the person's name; using voice recognition software, the machine identifies the person and then dials the number. Best of all, the Meridian works even if my PC's powered down.

Hey, I've got to go, the phone's ringing. I hope it's Stan—I could use the money.



Find files in this article at PC World Online ([www.fileworld.com](http://www.fileworld.com)). Contributing Editor Steve Bass is a licensed marriage and family therapist and president of the Pasadena IBM Users Group. See page 14 for contact information. ■

### Meridian 9617 USB

List price \$330; Nortel Networks; 800/466-7835; [www.nortel.com/phones](http://www.nortel.com/phones)

PC WORLD INFONET NO. 639



# Zip!

## For a faster tax refund click send



IRS *e-file* is today's way to file your income tax—and get your refund back in half the usual time. Even faster with Direct Deposit!

If you prepare your tax return on your PC or Mac, take the next step and *file* it electronically too.

Click! IRS *e-file* is fast, simple, accurate and secure. And you can e-file 24 hours a day, 7 days a week.

Do you owe more tax? You can still e-file your return now, get fast proof of acceptance from the IRS, but then wait until April 15th to make the payment. One option allows you to authorize a withdrawal from your bank account on the date you choose, up to April 15th. Another option allows you to pay with your credit card.

Any questions? Check the IRS Web site at [www.irs.ustreas.gov](http://www.irs.ustreas.gov) or your tax preparation software.

IRS *e-file*. It's the fastest way to get a tax refund.



CLICK. ZIP.  
FAST ROUND TRIP.

The Internal Revenue Service



Working to put service first



McAfee's mess ♦ Umax driver may damage disks ♦ More IE 4 security holes

# McAfee Utilities Just Don't Get Along

MCAfee SOFTWARE'S McAfee Office suite is a tempting buy. For \$100 you get a grab bag of ten separate, free-standing utilities—including VirusScan, Nuts & Bolts 98, and Guard Dog—that would cost hundreds of dollars if purchased separately. McAfee Software's parent company, Network Associates, acquired almost all these products when it recently bought up competitors CyberMedia, Helix Software, and PGP (Pretty Good Privacy), and the company's unfamiliarity with its stepchildren shows. *Bugs and Fixes* readers report problems just getting the suite installed.

McAfee Software recommends installing one product at a time. But even then, a conflict can bite you. Guard Dog's File Guardian feature may lock up your system when you try to use Nuts & Bolts 98's DiskMinder, DiskTune, or Image tools. At press time, the 20KB fix for the Guard Dog lockup was tucked away in the company's Web-based discussion forums at [support.nai.com/Forums/Attachment.cfm/GDFSHK.VXD?CFApp=23&Attachment\\_ID=71](http://support.nai.com/Forums/Attachment.cfm/GDFSHK.VXD?CFApp=23&Attachment_ID=71). McAfee Software suggests that you download the file and then copy it into your Guard Dog folder. (If you use Oil Change, it will put the file in the folder automatically.) When I downloaded the fix using Internet Explorer, however, the resulting file lost its .vxd extension—and the patch won't work without it. You may have to rename the file and add the missing file name extension back on. By the time you read this,



you may also be able to obtain the update by using the Oil Change utility that comes with McAfee Office.

Another headache with Nuts & Bolts 98: The Registry Wizard's Tune Up option has various problems that can corrupt Windows 98's Registry in some situations. McAfee Software posted an Instant Update fix last November but withdrew it when the new code caused the same problem elsewhere in the Registry. As we went to press, the company said it planned to release a corrected fix shortly. To download and install Nuts & Bolts 98 Instant Updates, choose *Start>Programs>Nuts&Bolts 98>Instant Updates*.

## THE SIEGE OF INTERNET EXPLORER 4

WHEN WE LAST left our browser insecurity drama (in last month's column), Microsoft had just patched Internet Explorer 4.01 to close a nasty security hole named after researcher Juan Carlos Garcia Cuartango. This flaw allowed Web page scripts to copy files from a user's hard disk to a remote system. Cuartango subsequently found another way to exploit the same flaw—a feat now renowned everywhere (except at Microsoft) as “Son of Cuartango.” The problem affects IE 4.01 and 4.01 with Service Pack 1 under Windows 95, 98, and NT 4.0. See Microsoft's explanation of the security flaw, along with a link to the new and improved patch, at [www.microsoft.com/security/bulletins/ms98-015.asp](http://www.microsoft.com/security/bulletins/ms98-015.asp).



You can find files mentioned in this article at PC World Online ([www.fileworld.com/magazine](http://www.fileworld.com/magazine)). Scott Spanbauer is a contributing editor for PC World. ■

## Umax Scanner Driver: Death to Disks

BUGS AND FIXES reader Steven Paglierani is more than just miffed at scanner maker Umax. While building himself a new cutting-edge system, Paglierani kept encountering file-corruption errors that prevented him from running—or even installing—Windows on his new system. After months of troubleshooting and replacing memory, hard disks, and hard disk cables, he stumbled across a Microsoft Knowledgebase article ([support.microsoft.com/support/kb/articles/q191/8/74.asp](http://support.microsoft.com/support/kb/articles/q191/8/74.asp)) that explained everything: One of Umax's scanner drivers randomly corrupts the hard disk's file allocation table. The problem occurs only with 300-MHz or faster Pentium II CPUs. Umax has posted a patch for the problem on its Web site. Point your browser to [www.umax.com/graphsite/umaxen/support/download/scanners.cfm](http://www.umax.com/graphsite/umaxen/support/download/scanners.cfm) and refer to TechNote 7076. (You have to register first at [support.microsoft.com](http://support.microsoft.com) to view the knowledge base.)

B U G G E D ?

FOUND A HARDWARE or software bug? Tell us about it via e-mail at [bugs@pcworld.com](mailto:bugs@pcworld.com).



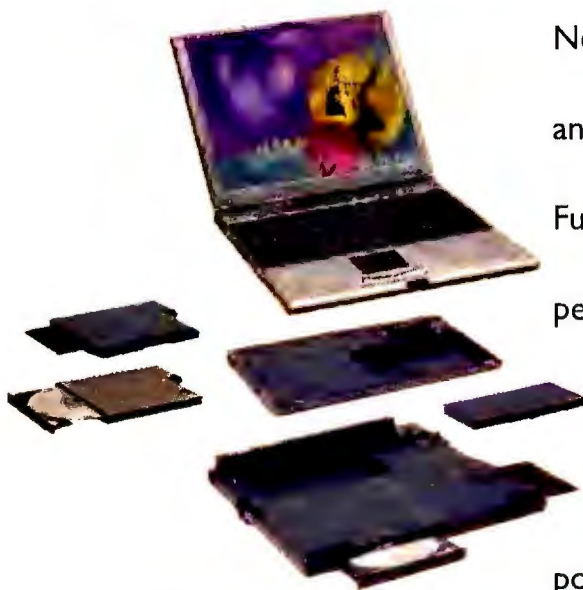


\*Detachable Multi-function Bay comes with interchangeable CD-ROM drive and floppy disk drive. Optional DVD drive and SuperDisk™ 120 drive available for purchase separately. Fujitsu and the Fujitsu logo are registered trademarks and LifeBook is a trademark of Fujitsu Limited. Built for Humans is a trademark of Fujitsu PC Corporation. Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corporation. Windows is a registered trademark of Microsoft Corporation. SuperDisk is a registered trademark of Imation Corporation. All other trademarks mentioned herein are the property of their respective owners. ©1999 Fujitsu PC Corporation. All rights reserved.



*Because  
you never know what  
you'll need next.*

Want tools? Want options?



*The LifeBook L Series with its Detachable Multi-function Bay\* (standard on L440B) and optional Mobile LAN Dock gives you a variety of storage device and battery power options.*

Need it all? Or would you rather pick and choose? Whatever your style, the Fujitsu LifeBook™ L Series notebook is perfect for you. With its ingenious

modular design, you can go from extremely portable to extremely powerful in minutes. It's slim and light,

(a mere 1.1" thin and 4.4 lbs. light) yet

full of the basics you demand, like a fast

Intel® Pentium® II processor and Windows®

OS pre-installed. It's the one tool you

need to get ready for who knows what.

**FUJITSU**

FUJITSU PC CORPORATION

B u i l t f o r H u m a n s™

For more info, visit [www.fujitsu-pc.com/dm](http://www.fujitsu-pc.com/dm)  
or call 1-888-4-ON-THE-GO.

Circle 94 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)





# TOP OF THE NEWS

## On Target! \$1499 PCs Hit the Mark

**No compromise.** Who says a great PC has to cost \$2000? Fast, full-featured systems based on Intel's new **Celeron-366** and **AMD's K6-2-400** could make you forget the Pentium II. ♦ **By Laurianne McLaughlin**



CyberMax Enthusiast KII 400





HP Vectra VE Series 8



IF YOU CONSIDER \$999 desktop PCs too light on features and \$2000 PCs too heavy on price, you'll like the new alternatives. Machines based on economical chips from Intel and AMD provide an excellent balance of speed and features, at a price that's right on the mark—about \$1499 including a monitor.

### FAST AND CHEAP

THE BEST CELERON-366 and K6-2-400 systems we tested for this review zipped through business productivity programs, in some cases running applications like Word and Excel faster than a Pentium II-350 system. Do you work (or play) with demanding graphics applications and games from time to time? No problem. Several of the new sys-

tems are strong graphics performers. (Note that graphics performance depends heavily on a system's graphics chip.)

Not only are these budget-friendly PCs great performers, they're feature rich. All five systems we tested came with 64MB of RAM, and only one had a hard drive smaller than 10GB. The most impressively loaded, CyberMax's Enthusiast KII 400, includes a DVD-ROM drive, a graphics card with 16MB of SDRAM, and a 19-inch monitor—all for an eye-popping \$1499 (see "CyberMax's Feature-Packed Enthusiast: Best of a Good Lot").

### BUDGET GETS BRAWNY

HOW DID BUDGET PCs turn into such racehorses? For one thing, Intel's rivals, especially AMD, are keeping the CPU business as competitive as

ever. Meanwhile, Intel has been trying to build a strong reputation for its budget-oriented Celeron chips.

Moreover, Intel has learned that making Celeron chips too much slower than Pentium IIs is risky business: Reviewers panned the first Celeron, the cacheless 266, because it performed poorly. The Celeron-333, which tacked 128KB of secondary cache onto the chip, ran much faster. Now, Intel is trying to further improve Celeron's image by rapidly cranking up the line's speed. By the time you read this, some vendors will be shipping computers based on the 400-MHz Celeron, a product Intel had originally planned to ship much later in the year. (The chip was not avail- ▶



### Free Software Suites

STAROFFICE 5.0 Personal Edition, the modest but capable office suite from Star Division, is available free to consumers via the Web at [www.stardivision.com](http://www.stardivision.com). (The offer doesn't apply to corporate users.) The suite can't match powerhouses like Microsoft Office feature for feature, but it's comparable to lesser products like Microsoft Works or Claris Works. It runs under Windows 95, 98, and NT; OS/2; Linux; and Solaris. The Windows version is a 62MB download. Likewise, Corel plans to offer its WordPerfect Suite 8 for Linux as a free download beginning on January 17. The company is also considering whether to offer some of its Windows products as free downloads.

### Visioneer Still Alive

VISIONEER, known for its PaperPort scanners and scanner software, is reorganizing, but its popular products will still be sold and supported. Taiwan-based Primax, which makes Visioneer's scanners, will take the company's name and hardware business. Visioneer bought Xerox's ScanSoft subsidiary and will sell and support ScanSoft's Pagis document management and optical character recognition products as well as PaperPort software, under the ScanSoft name.



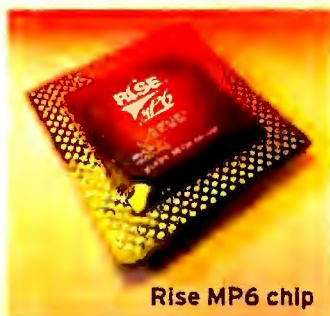
Point your browser to [www.pcworld.com/pcwtoday](http://www.pcworld.com/pcwtoday).

GET UP-TO-THE-MINUTE NEWS, including hot game demos, the latest reviews, and productivity shareware, at PC World Online.



## Rise Technology's MP6: Newest Chip on the Block

TALK ABOUT LOOKING your competition in the eye: Rise Technology, the newest CPU maker, has set up shop in Santa Clara, California, right across the street from Intel. This new company is jumping into a



Rise MP6 chip

tough game—building low-cost CPUs for budget desktops and notebooks and selling them at

prices below Intel's. The first Rise CPU, the MP6, will appear in desktops by the end of the first quarter, the company says. For this article, Rise gave *PC World* an early peek at a reference system powered by the MP6.

Rise faces four established players: AMD, Centaur, Cyrix, and Intel. AMD has made progress

recently, thanks to a generation of chips for desktop PCs that run as fast as 400 MHz.

### LOW-END COMPETITION

CYRIX AND CENTAUR currently compete with Intel's low-end chips. That's where Rise hopes to fit in—by beating Cyrix's and Centaur's chips on performance. Rise says it has paid particular design attention to how quickly the MP6 chip executes MMX instructions

and how smoothly it handles soft DVD video playback. Those results remain to be seen; the MP6-powered PC we tested wasn't ready for a full round of graphics testing.

The MP6 chip will debut in two flavors: One will have a 266-MHz performance rating and will be designed for a 100-MHz system bus; the other will have a 233-MHz performance rating and will be designed for a 95-MHz system bus. (A performance rating, also

able for testing at press time.) As a result of these changes, the once-lowly Celeron now packs enough punch to please even a power user.

### CELERON VS. PII

FIRST CONSIDER the Celeron's performance. Two of the three shipping Celeron-366

machines we tested, the Hewlett-Packard Vectra VE Series 8 and the Micron Millennia C366, recorded PC WorldBench 98 scores of 188 and 186, respectively, on business apps (see the test report below). In comparison, the Pentium II-350 machines with 64MB of RAM that we've test-

ed earned scores between 178 and 188—almost identical to, if not a bit slower than, the numbers posted by Celeron-366 computers. And the average PII-400 machine snagged a score of 198, only about 5 percent faster than the HP Celeron-366 machine. It's unlikely you'll notice that

small a difference in apps like Word or Excel. The fastest PII-400 system with 64MB of RAM we've tested scored 203, an unexciting 8 percent faster than the HP system.

Now compare the prices: While the new budget PCs we reviewed range from \$1399 to \$1568, you'd have to pay at

least \$1599 for many Pentium II-350-based PCs and at least \$1699 for many PII-400 systems. (Some high-end PII-350s and PII-400s sell for closer to \$2000.) You'd pay at least \$2200 for most PII-450 systems, but such machines are significantly faster (an average of about 13 percent) than the best Celerons.

For some people, a Pentium II-based computer offers advantages that go beyond clock speed. PII-350, -400, and -450 PCs incorporate a 100-MHz system bus, whereas the Celeron-366 and -400 system bus runs at 66 MHz. The faster bus speeds up some tasks, particularly those that involve large graphics or database files that don't

## DESKTOP PCs: BUSINESS APPS TEST REPORT

### Celeron-366 and K6-2-400 Stand Up to Pentium II

SYSTEM	CPU	RAM (MB)	Secondary cache (KB)	PC WorldBench 98 score	Faster	Application test time
Compaq Prosignia Desktop Model 310	Celeron-366	64	128	170		
HP Vectra VE Series 8	Celeron-366	64	128	188		
Micron Millennia C366	Celeron-366	64	128	186		
Compaq Presario 5240	K6-2-400	64	512	170		
CyberMax Enthusiast KII 400	K6-2-400	64	512	187		
Average of 14 systems	Pentium II-450	64	512	213		
Average of 15 systems	Pentium II-400	64	512	198		
Average of 6 systems	Pentium II-350	64	512	183		
Average of 7 systems	Celeron-333	64	128	173		

Minutes 0 10 20

Word 97 Word Pro 97 Excel 97 1-2-3 97 Paradox 8.0 Picture Publisher 7.0

**TEST HOW WE TEST** All systems are tested with PC WorldBench 98, *PC World's* application-based benchmark. A higher PC WorldBench 98 score is better. For more details on our benchmark and how we run it, see PC World Online ([www.pcworld.com/testing](http://www.pcworld.com/testing)). Data based on testing conducted by the PC World Test Center. All rights reserved.



known as a "PR rating," represents the performance level of the Intel chip against which the MP6 will compete—in this case, the competition is the Celeron-266.)

Like the original Celeron-266 processor (and unlike the Celeron-333 and -366) the MP6 chip lacks on-board secondary cache. This design hurts performance.

## MORE SPEED AHEAD

THE MP6 266-MHZ reference machine we tested came with 64MB of system RAM and 1024-

KB of secondary cache on the motherboard. It earned a PC WorldBench 98 score of 119, on par with scores turned in by Celeron-266 and AMD K6-266 systems on productivity apps.

If Rise Technology achieves its goal of delivering better graphics performance than Cyrix and Centaur, however, MP6-powered machines will be more competitive. But even then, MP6 systems would probably have to be ultra-cheap (certainly well below \$999) to be worth considering. Analyst

Nathan Brookwood of Insight 64, a consultancy in Saratoga, California, says we'll likely see the first chip only in systems from small, third-tier PC companies.

Rise's second planned chip, the MP6-II, looks more compelling, since it incorporates secondary cache. The first systems using this chip will ship in the second quarter of this year, Rise says. Though the company wouldn't confirm the speeds of this chip, it is expected to offer 333- and 366-MHz performance ratings. Stay tuned.

fit inside the secondary cache. So for work like intensive desktop publishing or database mining, a fast Pentium II-powered system is worth the extra cost.

Also, systems with a 100-MHz bus make it easier to upgrade the CPU later. And

users with demanding graphics needs, for whom every second counts, will probably want a PII-450 machine. Outfitted with good graphics cards, PII-450 machines run applications like Macromedia Director (a multimedia authoring tool) and games like Redline

Racer faster than machines powered by a Celeron-366 or K6-2-400 processor can.

## SMART CONFIGS

BUT FOR MANY people, the new Pentium II alternatives from Intel and AMD offer plenty of speed. You'll see the

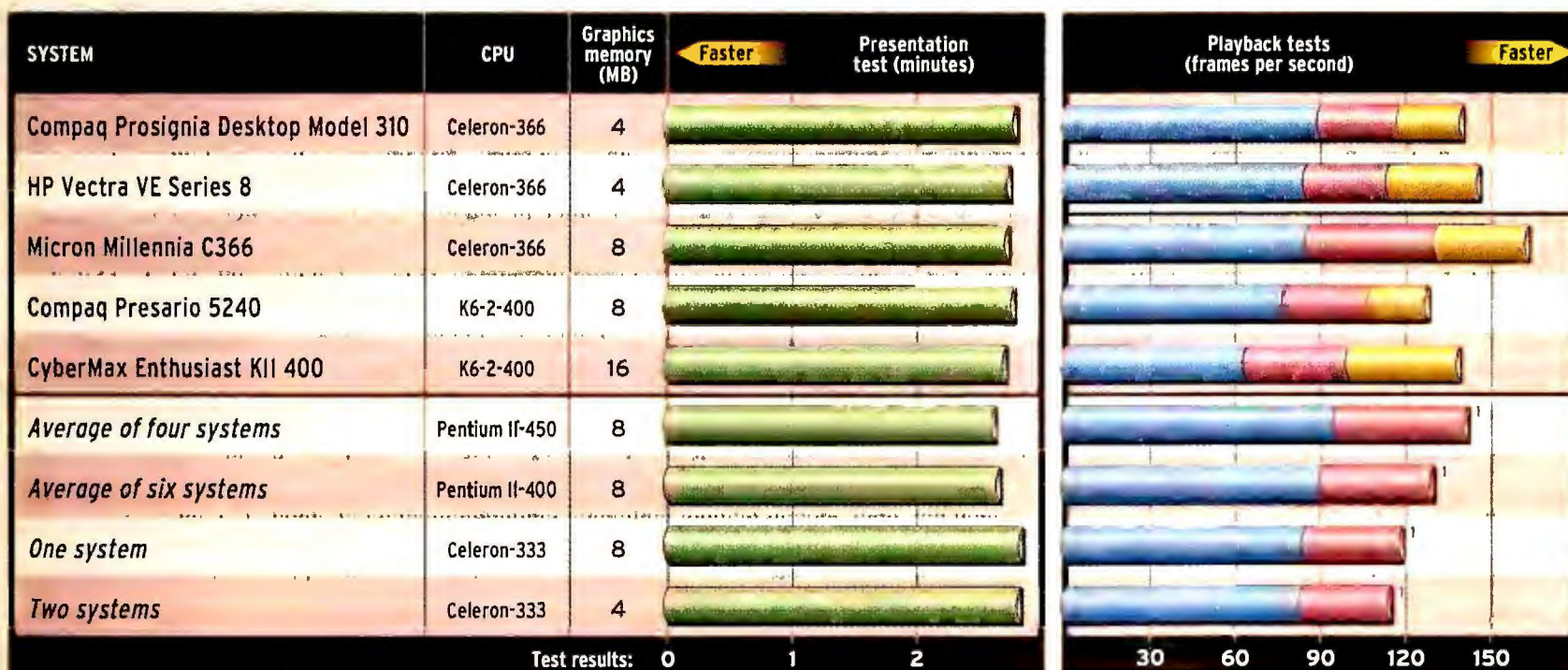
Celeron-366 in systems designed for corporations, small businesses, and homes.

At just \$1434 with a 17-inch monitor, the HP Vectra VE Series 8 is a smart midrange corporate system for running Microsoft Office-type applications. Like other Vectra VEs, it has a 3Com 10/100 network card; HP's manageability software, which lets IS managers detect hardware problems early; and theft-prevention features like a lockable case. It's not suited for image-editing work, but its integrated Matrox MGA G-100 AGP graphics chip with 4MB of SGRAM works fine for apps like PowerPoint. Our only quibble: HP's 4.3GB hard drive is the smallest of the bunch.

For \$1449 with a 15-inch monitor, Micron's Millennia C366 home PC delivers ►

# DESKTOP PCs: GRAPHICS APPLICATIONS TEST REPORT

## Micron and CyberMax Provide Solid Graphics for Under \$1500



PowerPoint 97 Director 6 Redline Racer Incoming



**HOW WE TEST** In Microsoft PowerPoint 97, we time a script that builds a 50-slide presentation; faster times are better. Using Microsoft Active Movie, we play back a looping AVI clip while running an animation created using Macromedia Director in the foreground. We also execute self-running demos in Criterion Redline Racer and Rage Incoming. For all three playback tests, higher frame rates are better. Tested applications do not make use of AMD's 3DNow technology. All systems tested with 64MB of system RAM. Celeron-366 and Celeron-333 machines tested with 128KB secondary cache; all others with 512KB. Data based on testing conducted by the PC World Test Center. All rights reserved. Incoming is a new addition to PC World's graphics test suite, and data is not available for some older systems.



## CyberMax's Feature-Packed Enthusiast: Best of a Good Lot

CELERON-366 SYSTEM	Street price	Monitor size (inches)	Hard drive (GB)	CD/DVD-ROM drive speed	Graphics adapter/memory (MB)	Additional features	PC World InfoNet number
Compaq Prosignia Desktop Model 310 800/345-1518 www.compaq.com	\$1399	17	10	12X-40X	Diamond Viper V330/4	V.90 56-kbps modem, Compaq PS110 speakers	724
HP Vectra VE Series 8 800/755-0900 www.hp.com/desktop	\$1434	17	4.3	12X-32X	integrated Matrox MGA G-100 AGP/4	3Com Fast Etherlink XL (10/100Base-T card with Wake on LAN functionality), lockable system case	725
Micron Millennia C366 888/634-8799 www.micronpc.com	\$1449	15	10	24X-32X	integrated NVidia RIVA 128 ZX/8	V.90 56-kbps modem, Advent AV009 speakers	726
K6-2-400 SYSTEM							
Compaq Presario 5240 800/345-1518 www.compaq.com	\$1568	15	10.2	12X-40X	ATI 3D Rage LT Pro AGP/8	V.90 56-kbps modem, LS-120 drive, integrated Compaq 10-mbps network card, JBL Pro speakers	727
CyberMax Enthusiast KII 400 888/438-2629 www.cybermaxpc.com	\$1499	19	10	4.8X DVD-ROM	STB Velocity 4400/16	V.90 56-kbps modem, Aztec PCI 3D sound card, ACS 45.1 speakers, 10Base-T ethernet card	728

All systems have 64MB of system RAM. Celeron-366 systems have a 128KB secondary cache and AGP graphics. K6-2-400 systems have a 512KB secondary cache and AGP graphics.

goodies like a V.90 modem and an integrated NVidia RIVA 128 ZX graphics chip (with 8MB of SGRAM) on the motherboard. The extra memory helped this machine play 3D games more smoothly than the other two Celerons did, and to run one game, Redline Racer, faster than some PII-400s (see "Micron and CyberMax Provide Solid Graphics for Under \$1500"). But remember, graphics speed often boils down to the graphics chip, not the CPU.

Compaq's Prosignia Desktop Model 310, part of a new line aimed at small businesses, costs the least of the five systems we reviewed—just \$1399 with a 17-inch monitor. Like the Micron, it carries a V.90 56-kilobits-per-second modem. The Prosignia 310 also has a Diamond Viper V330 graphics card armed with 4MB of SGRAM.

### K6-2-400s: BRING 'EM ON

NOW ON TO THAT healthy competition from AMD. Based on our first look, AMD's K6-2-400 systems

hold their own against Celeron-366 machines and slow Pentium II-400s. Like previous K6-2 chips, the K6-2-400 includes AMD's 3DNow CPU instructions, designed to speed up applications specially enhanced for 3DNow or DirectX 6.0. Today, less than

These systems are **solid**, reasonably priced, and **don't skimp on features**—a good choice for **work or home**.

20 applications have native support for 3DNow, and most of these are games.

Of the two K6-2-400 systems we tested—the CyberMax Enthusiast KII 400 and the Compaq Presario 5240—the CyberMax was the clear winner. This \$1499 machine earned a WorldBench 98 score of 187, almost identical to the scores of the HP and Micron Celeron-366s. The two slowest PII-400 systems with 64MB of RAM we've tested earned similar scores (191 and 185), whereas the fastest PII-400 system earned a score of 203, or about 9 per-

cent faster than the Enthusiast (a negligible difference when you're running a word processor or spreadsheet).

The Enthusiast comes with an STB Velocity 4400 graphics card laden with 16MB of SDRAM. That supply of graphics memory, the most generous here, helped the PC outperform the other four systems on two of four graphics tests: It earned the best score when running a PowerPoint presentation with an AVI file operating in the background, and when running a 3D game called Incoming. Considering that the Enthusiast also comes with a 19-inch monitor and a DVD-ROM drive, its price makes it a steal. To top it off, CyberMax earned good marks in our recent Reliability and Service survey (see "PC Reliability and Service: Who Can You Trust?" [www.pcworld.com/nov98/service](http://www.pcworld.com/nov98/service)).

Compaq's Presario 5240 looks less impressive in comparison—\$1568 gets you a 15-inch monitor and a graphics card with 8MB of SGRAM. The system was noticeably

slower than the CyberMax on business apps, too, earning a WorldBench 98 score of 170.

### CENTS AND SENSIBILITY

COMPUTERS BASED ON the Celeron-366 and K6-2-400 chips are right on the money for many PC buyers. They are solid, reasonably priced work and home PCs that don't skimp on features. They run business productivity apps quickly. And unless you regularly tax your system's CPU with such demanding work as database mining, or you live and breathe graphics apps that cry out for every bit of speed available, these \$1499-range PCs have plenty of power. (If you must have a high-end Pentium II, it pays to look ahead. See "Your PC in the New Millennium" on page 104.)

We can't make sweeping assumptions about K6-2-400 systems based on the two we tested here. But if there are more like the CyberMax Enthusiast out there, all we can say is, "Bring 'em on." Finally, you've got a great choice in between \$999 lightweights and \$2000 wallet busters.



# Microsoft Office 2000 Offers New Apps and Web Tools

## B E T A

MICROSOFT OFFICE 2000 is here—in spirit. True, the upgrade to the 800-pound gorilla of office suites won't ship until the second quarter of this year. But in the meantime, Microsoft's site is hawking a \$20 beta version it calls a "Preview." Available now, nearly feature complete, and surprisingly stable, the Preview provides a solid picture of what to expect in the final version.

If you want to create content for Web sites or a corporate intranet, Office 2000 looks like a winner—it's brimming with new Internet features. But mostly, this upgrade focuses on sensible tweaks to existing tools. Few of the changes will revolutionize the way you work; others may even annoy you. And while Microsoft hasn't made the wholesale changes to file formats that it did with Office 97, I ran into some compatibility problems in my tests when running PowerPoint.

Even experienced Office users may need to spend time adjusting to alterations in the interface. Some changes are sure to be crowd-pleasers. For instance, the clipboard can finally hold more than one item. It now tracks up to 12 elements, letting you paste them selectively.

## INTERFACE CAVEATS

IN CONTRAST, other "improvements" are questionable. To re-

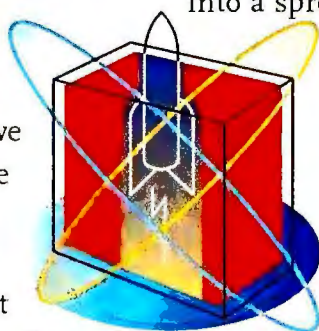
duce on-screen clutter, Microsoft has redesigned the menu system so that menus show a shortened list of commands. If the command you're looking for isn't listed in a menu, you have to hover the mouse pointer over the menu for a moment, whereupon it will expand to show all the commands.

As you use features, Office promotes them to the top-level menu. After two weeks, however, I still had some trouble remembering where commands would show up. (The old-style menus remain available as an option.)

Microsoft has greatly improved Office 2000's Web features. Word, for instance, is now a considerably more advanced HTML editor: It handles frame layouts with ease and has simpler tools for embedding hyperlinks. Excel's

Web Query feature, which was tricky to use in Excel 97, now lets you easily grab tabular data from a Web site, plunk it into a spreadsheet, and then

tell the program to refresh it automatically with new data whenever the Web site changes. Likewise, PowerPoint has new



The **upgrade** could cost about \$350, so **spending \$20** to test drive the Preview **makes sense**.

Internet tools, including the ability to broadcast a slide show over the Web.

## HTML SAVVY

CORE APPS can now open and save HTML documents as if they were native files. So, if you're creating Web pages, you can opt to work in HTML exclusively, rather than juggle multiple versions of documents. In my informal tests,

Word and Excel created HTML documents that looked good in both major Web browsers. The documents also retained all their formatting when I brought them back into Office. But PowerPoint rendered pages that could be displayed only by Internet Explorer 4.0 or higher. (The app creates HTML files that can be read by IE 3.0 and Navigator, but it can't open these files itself.)

Most of Office's native file formats remain unchanged. Only Access has a new file format, and it can export databases for use in earlier versions of

the app. That means you can still share most files with users of Office 97, Lotus SmartSuite, or Corel's WordPerfect Suite unless you

use the new HTML formats.

Beyond the Web features, Microsoft has mostly enhanced existing features in apps as opposed to adding radically new ones. Word's on-the-fly spelling checker, already invaluable, now fixes more typos automatically: Type "editoin," for example, and Word corrects it to "edition" as you continue typing. And Excel's PivotTable data-analysis feature is both easier to use (you can lay out a PivotTable directly on a spreadsheet, rather than in a separate window) and more powerful (you can turn PivotTable data into interactive charts).

## GROUP WISE?

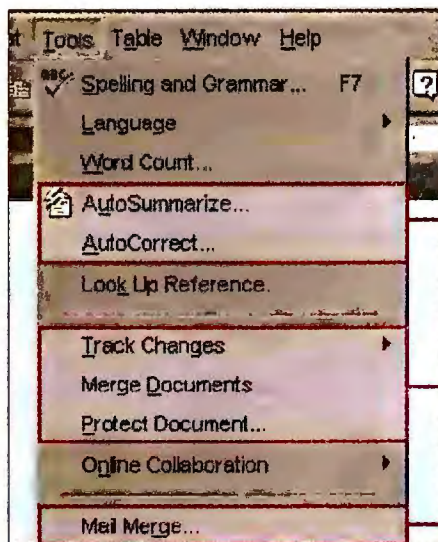
MICROSOFT HAS also added some collaborative tools. Documents can now include threaded discussions that let coworkers comment on a work in progress. You can also embed snippets of interactive data, such as Excel PivotTables, ►

## Newer = Better?

We liked the new clipboard, but not the "improved" menus.



**A SMARTER CLIPBOARD** lets you cut up to 12 items for selective pasting.



**WITH OFFICE'S NEW MENUS**, some items aren't visible unless you expand the menu.



## Office Adds FrontPage, PhotoDraw, and Publisher

MICROSOFT OFFICE isn't one product: It's a series of packages, each encompassing multiple programs. In Office 2000, Microsoft has shuffled the lineup and added a version called Premium to the existing Standard, Small Business, Professional, and Developer editions.



The company's popular Publisher desktop-publishing program is now part of every Office version except Standard. This is great if you create graphically rich documents; the program is packed with easy-to-use wizards for designing brochures, Web pages, and so on. Serious

Web and graphics types will want to invest in Office 2000 Premium, which includes the FrontPage Web site creator and PhotoDraw, a powerful business-graphics editor.

### SOME BEEFS

FRONTPAGE, PhotoDraw, and Publisher are all welcome additions. But while Microsoft has

tried to integrate the new members, it hasn't gone all the way. PhotoDraw's user interface looks different from that of Office's other applications. Also, both PhotoDraw and FrontPage must be installed separately. Finally, the improved clipboard, one of the suite's best new features, doesn't work in these three apps.

into a Web page, so your colleagues can manipulate the tables in their Web browsers.

These features show potential, but some will work only in organizations that standardize on Microsoft products. For example, Excel PivotTables look fine in Internet Explorer, but

because they rely on ActiveX technology, Netscape Navigator users won't see them at all.

Pricing for Office 2000 was not set at press time, but Microsoft says the suite will cost about the same as the current versions. (Office 97 Professional is \$349 as an upgrade

and \$599 for the full version.) At those prices, spending \$20 to take the Preview edition for a test drive makes sense. Except for Outlook, the Preview can be installed alongside your current version of the suite, which means you don't have to give up Office 97. If

that's too much bother, check back with *PC World*: Our April issue will have an in-depth, application-by-application review. —Harry McCracken

### Office 2000 Preview

\$20; Microsoft; [www.microsoft.com/office/preview](http://www.microsoft.com/office/preview)

## Better Than Aspirin: New Tax Software Relieves Those April 15th Headaches



ROTH IRAS, capital gains changes, child credits—this year's tax law changes are so complicated that even the savviest do-it-yourselfers may need help. Fortunately, the two major tax preparation packages—Intuit's TurboTax and Block Financial's Kiplinger TaxCut—are better-looking and simpler to use than ever. Want to save money? A plethora of Web sites let you do your taxes for as little as \$10.

Electronic filing is easier and more worthwhile than ever. E-filers can now pay electronically simply by providing their bank routing and account numbers. You can even specify when your account should be debited—as long as

you hit the April 15th deadline.

If you used tax software last year, you won't even have to mail in a form with your signature. The IRS will send you a sealed postcard with a five-digit "e-file customer number" to authenticate your electronic

ally filed return. And the IRS promises to dispatch e-filers' refunds within three weeks.

### TURBOTAX FACE-LIFT

TURBOTAX, the longtime market leader, has a new look. Two-thirds of the screen re-

tains the familiar layout of years past: interview on top, form on the bottom. But navigation is easier thanks to a new bar down the left side that lists all screens in the current section of the software and highlights those you've completed. To get to a screen, simply click on its description.

Other, less obvious changes abound. Both the fast-track interviews (which have fewer explanations) and the regular interviews have been condensed into fewer screens. FAQs appear on the interview screen, so you don't have to leave the interview to get help.

The basic federal 1040 edition costs \$35 (street price); the \$50 Deluxe edition adds multimedia help, a library of pub-

lications, tax and IRA planners, and free online

filing for one return. TurboTax also offers business-

**TURBOTAX'S NEW Interview Navigator bar makes it easy to access different screens in the program with a single mouse click.**

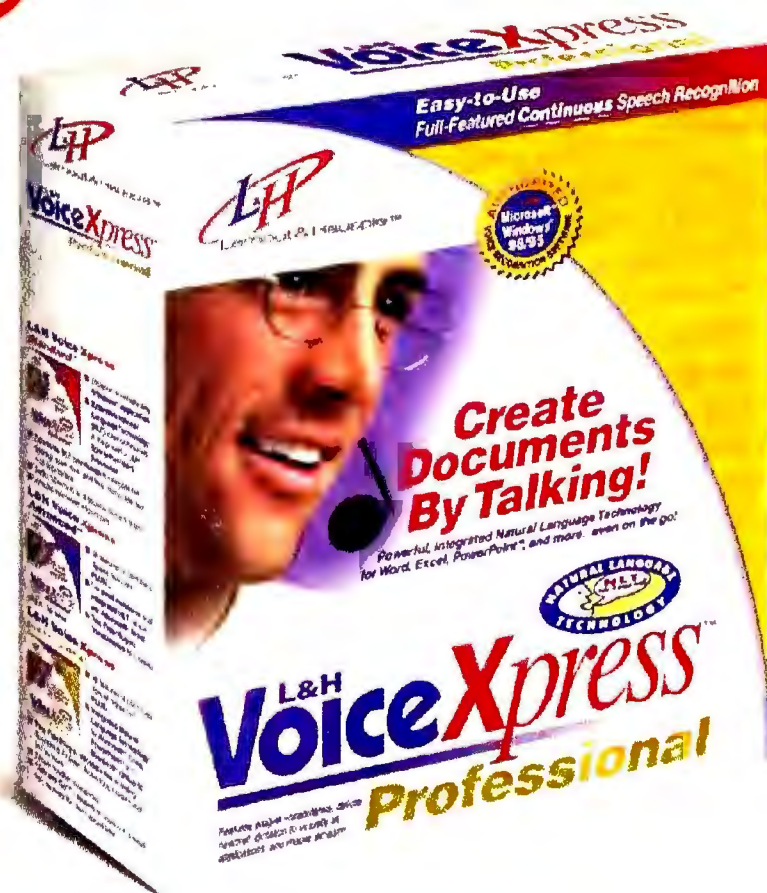


# Turn Talk Into Text. Instantly!

L&H Voice Xpress Professional™ is the ultimate continuous speech dictation software for today's business professional.

L&H Voice Xpress Professional™ turns speech into text on screen quickly and accurately – without typing. Build letters, reports, spreadsheets, presentations and virtually any other document simply by talking normally!

- NEW** Advanced Natural Language Technology offers an extensive command language that lets you "Say It Your Way."
- NEW** Dictate to virtually all Windows® applications creating documents as fast as you speak.
- NEW** Extensive command and control to format and edit documents in Microsoft® Office, including Word 97/95, Excel 97, PowerPoint® 97, Outlook® 98, and Outlook® Express. And, it's optimized for Windows® 98.
- NEW** Four FREE special plug-in vocabularies for Business & Finance, Leisure, Technology, and In The News.
- NEW** "Talk and Go™" capability for certain hand-held devices – perfect for the mobile professional.
- NEW** Reads documents back to you – making editing a snap.



**\$149<sup>99</sup>\***  
\* estimated retail price

**30-Day Money Back  
GUARANTEE**



**1998  
MVP  
PC Computing  
Winner**  
Best Voice Recognition  
November 1998

To order, visit our web site, call toll free at 1-800-236-6165  
or visit one of our fine dealers listed below.

**CompUSA  
OfficeMax  
Staples**

**Office Depot  
ComputerCity  
Fry's**

**Best Buy  
MicroCenter**

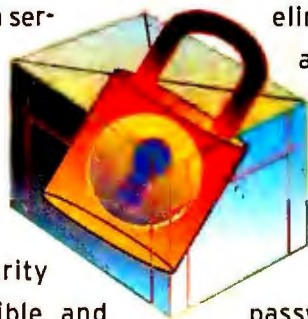
**L&H**  
Lernout & Hauspie™  
[www.lhs.com](http://www.lhs.com)



## Tips for Safe Filing

AT A TIME when many people still balk at putting their credit card numbers online, how do Web-based tax preparation services hope to convince customers to entrust their financial data to a browser? The answer: by using as many security measures as possible and telling prospective customers about each one.

Thomson Investor's Network's OneTax.com Web site, for exam-



ple, lists security features on its home page. These include SSL servers, which encrypt data traveling between your PC and the firm's servers; encryption of all user-identifying data; and multiple firewalls to prevent illegal access. Even passwords are encrypted: Nobody at OneTax can access them. The safety net is a backup password for which OneTax employees can give you only a self-

oriented packages, including a \$90 version that supports partnerships and corporations. The one downside is that the software on state taxes is relatively expensive—\$28 for the first state and \$20 for each additional one.

Deluxe delivers multimedia help, a fast-track interview, improved navigation, Roth IRA assistance, and online updates. TaxCut also comes in a no-frills \$20 Basic edition, but that package leaves you having to pay \$25 more for the all-

supplied hint. Your completed return doesn't even travel the Internet: OneTax transmits it via private phone line to the IRS.

### HOMEWORK TIME

INTERNATIONAL DATA Corporation analyst Chris Christiansen advises taxpayers to do some research before choosing a Web-based tax preparation service. At the very least, online filers should look for SSL servers and 40-bit encryption. Server-level data encryption and use of Diffie-Hellman or RSA encryption algorithms are also desirable. Privacy policies should include a commit-

ment not to sell your personal data without your permission.

Web sites have the same fiduciary responsibility as a local tax preparer to keep your data confidential. "Unlike credit card information, tax information is protected by federal statute," says Ed Murphy, director of business development and marketing at Thomson Investor's Network.

How can you tell if all this security is working? Short of hiring a hacker to attempt a break-in, you have to take the Web site's word for it. "If you're using a reputable software vendor, you should be okay," Christiansen says.

to find using the IRS Web site ([www.irs.ustreas.gov](http://www.irs.ustreas.gov)). The three sites I previewed—Intuit's new WebTurboTax, Thomson Investor's Network's OneTax.com, and Universal Tax Systems' SecureTax.com—let you complete your return for free, charging only for printing your return in a usable form or filing it.

The most impressive—and expensive—of the three was WebTurboTax. It's a virtual twin of the retail package, but without the multimedia help and (a more significant gotcha) the ability to import data from a previous year's return. Fees run \$10 for a 1040EZ and \$20 for a standard 1040, and \$10 or \$20 for a state return, depending on complexity.

SecureTax.com's attractions include 4000 downloadable IRS forms, a 2-minute tax-refund estimator (suitable only for the simplest of returns), and a tax organizer. But you can import data from only last year's version of SecureTax. Fees are \$15 for a 1040 return and up to three state returns, and \$10 for a

1040EZ and state filing. OneTax.com looks handsomer than SecureTax and charges only \$10, but the site warns users with even minor complexities, such as home-office deductions, to go elsewhere.

Advice on SecureTax.com and OneTax.com is limited. The beta versions I tried out had annoying glitches: Resizing windows can force you to log in again; boxes unexpectedly turn up checked; and navigation can be difficult. In general, if you need solid advice, the deluxe CD retail packages are the best way to go, with TaxCut the year's best deal.

—Yardena Arar ►

### Block Financial

Block Financial; 800/235-4060;  
[www.taxcut.com](http://www.taxcut.com)

PC WORLD INFONET NO. 720

### TurboTax

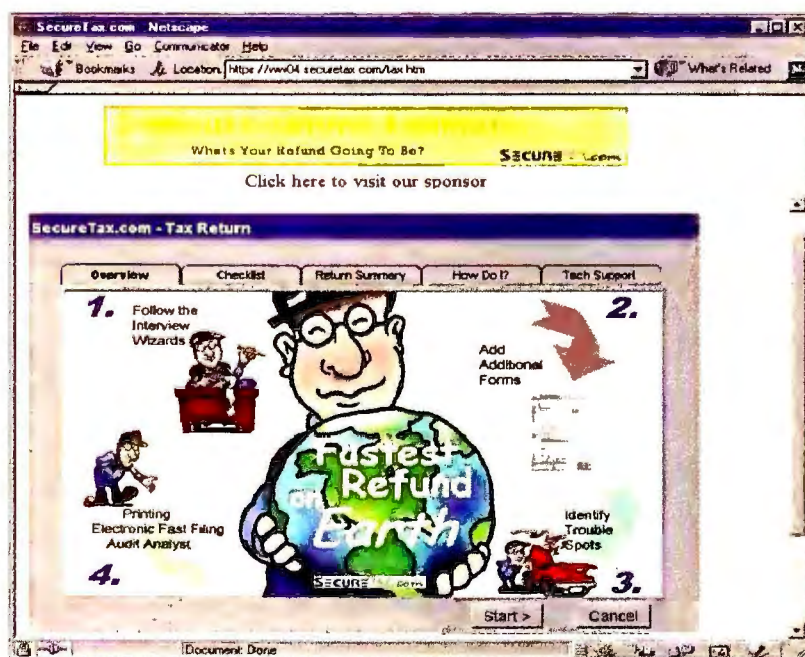
Intuit; 800/446-8848;  
[www.turbotax.com](http://www.turbotax.com)

### OneTax.com

Thomson Investor's Network;  
[www.onetax.com](http://www.onetax.com)

### SecureTax

Universal Tax Systems;  
[www.securetax.com](http://www.securetax.com)



**1040 TOON:** A friendly virtual accountant offers limited help to taxpayers who prepare their returns on the SecureTax.com Web site.

In comparison, Block's Kiplinger TaxCut Deluxe is a bargain. The \$40 street price includes free electronic filing and all necessary state tax software. You don't give up much, either. Like its rival, TaxCut

states CD. Block also offers a \$70 business edition.

### DO IT ON THE NET

MANY NEW Web-based tax preparation programs are cheap, easy to use, and a snap





# Q

“Whoa.  
You been  
working out?”

It's a head-turning combination: Compaq Armada 7000 Series notebooks have the muscle—Intel® Pentium® II processors up to 300 MHz—to run desktop-class software.

Yet they're built for the road, with models

featuring ultra-durable magnesium alloy casings.

And they're loaded: displays up to 14.1". Hard drives

up to 8 GB\*. Dazzling AGP graphics. Plus, they dock into our

highly expandable ArmadaStation or Tower Stand. To learn more,

call 1-800-AT-COMPAQ. Or visit [www.compaq.com/whoa](http://www.compaq.com/whoa).



**COMPAQ** Better answers.™



# Visio Standard 5.0

FOR THE IDEAS  
WORDS  
SIMPLY  
CAN'T SAY.

As complex as business processes are today, explaining them with mere words simply won't do. Thankfully, with Visio® Standard business diagrams, you can show your team exactly what happens when, who is responsible for what, and precisely how work should flow. Better still, Visio Standard makes creating diagrams a snap. Simply select pre-drawn SmartShapes® symbols from our extensive library and drag them into place. Add text, format, and route to co-workers in e-mail, or include your diagram in a Microsoft Word document, or Microsoft PowerPoint presentation. So, when words just can't say it all, show it with Visio Standard. Call us at 1-800-24-VISIO, reference A436. Or you can see Visio Standard in action at [www.visio.com/ideas](http://www.visio.com/ideas).



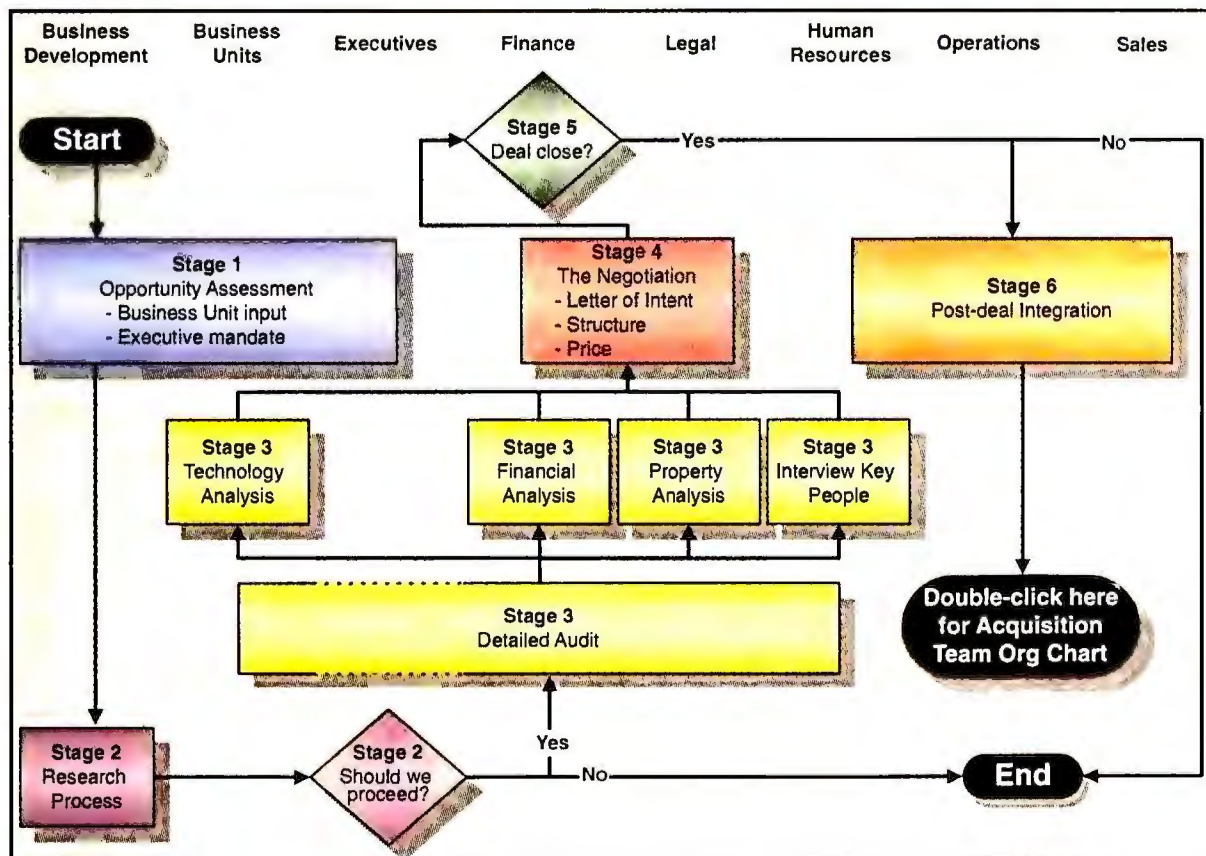


FREE MICROSOFT® INTELLIMOUSE®  
WITH PURCHASE OF VISIO STANDARD 5.0.

SEE VISIO STANDARD BOX FOR DETAILS. OFFER EXPIRES 1/31/99.

FREE!  
IntelliMouse

## Acquisition Strategy



Visualize your business™





## Software Prices Still Rising: Blame It on Microsoft

### ANALYSIS

NO MATTER how the "anti-trust trial of the century" turns out, one verdict is already in: Consumers have lost.

According to system vendors, industry analysts, internal Microsoft documents, and a report by an independent consumer group, Microsoft's overwhelming domination of the markets for operating systems (over 80 percent) and for productivity software (nearly 80 percent) has translated into higher prices and limited choices for consumers.

### DOUBLING THE PRICE

PC VENDORS won't say how much they pay for copies of Windows, and they're understandably nervous about criticizing Microsoft. But ask them off the record, and they'll tell you that Microsoft has more than doubled what it charges computer makers for its OSes—from \$15 to \$25 in 1991 to between \$40 and \$70 in 1998, depending on the size of the vendor (see "Fewer Choices, Higher Prices").

Microsoft won't comment on its pricing policies. But the company's own internal memo entitled "PC Value Analysis," written in 1996, found that the operating system accounted for 0.5 percent of a PC's total cost to consumers in 1990, then jumped to 2.5 percent in 1996. According to Frederick Warren-Boulton, a former Reagan administration economist and a key government witness in the Microsoft case, the percentage

has doubled again since then.

Microsoft's price increases have been equally tough on consumers who buy OSes off the shelf. According to the Software Publishers Association, in 1992 the stand-alone version of Windows 3.1 retailed for about \$100; such a version of Windows 98 now sells for about \$160.

### KILL THE COMPETITION

"COMPANIES THAT make disk drives, monitors, and memory—those that have real

## Fewer Choices, Higher Prices

SINCE IT HAS achieved dominance in the market for operating systems, Microsoft has more than doubled the prices of its OSes to PC makers.



<sup>1</sup>Worldwide installed base of 16- and 32-bit Windows, as a percentage of overall PC operating systems. Source is International Data Corporation.

<sup>2</sup>Figures came from the Consumer Federation of America. <sup>3</sup>Figures were obtained from PC World interviews with PC vendors.

competition—have cut prices, while Microsoft, which has killed off its competition, has raised prices," says Mark Cooper, consumer advocate and author of "The Consumer Case Against Microsoft."



Cooper's report, written for the Consumer Federation of America (a Washington, D.C.-based consortium of state and

local public interest organizations), sharply criticizes the software giant's pricing and marketing tactics. "If Microsoft was like any other technology company," Cooper says, "the price for its operating system should have come down 3 percent or in the worst case stayed flat."

Compare prices in markets where Microsoft faces strong competition with those in markets it dominates. For example, Intuit's popular Quicken Deluxe personal finance program costs about \$60, a bit less than it did a couple of years ago; Microsoft's Money 99, which lags behind Quicken in market share, costs roughly the same. It's a different story in the office suite arena, where Microsoft has a 78 percent market share. According to a

survey of online software stores conducted by PC World, Microsoft's Office 97 costs an average of 33 percent more than its rivals. At one CompUSA store, Office 97 sells for \$450, while Lotus' SmartSuite and Corel's WordPerfect Suite can be had for \$400 and \$300, respectively.

### HIGHER SHARE, HIGHER PRICES?

MICROSOFT'S CRITICS say the connection between pricing and market share is proof of Microsoft's monopolistic power. According to International Data Corporation, Windows accounted for 75 percent of desktop operating systems installed worldwide in 1991; by 1998, that share had grown to 82 percent.

Microsoft acknowledges that it has pushed the boundaries on OS pricing. In a memo to CEO Bill Gates on December 16, 1997, Joachim Kempin, senior vice president of Microsoft's OEM division, warns that the company's prices for OSes could alienate such stalwart customers as Compaq. (Compaq alone pays Microsoft



upwards of \$750 million a year for operating system licenses.) "Our high prices could get a single [hardware vendor] or a coalition to fund a competing effort," Kempin wrote. In other words, those vendors might develop their own operating systems.

## GOT COREL?

BUT KEMPIN'S concerns that incensed vendors might form a coalition and develop a competing OS never materialized. Today, no major computer vendor, with the exception of Apple, preinstalls any OS but Windows on its systems. A couple of them may give you the option of special-ordering another operating system, but they won't make it easy. Likewise, most hardware companies will preinstall only Microsoft versions of popular applications, especially office suites. Consumers buying from Micron or Gateway can't substitute Lotus SmartSuite or Corel's WordPerfect Suite for Microsoft Office; Compaq will install those other packages on your new computer, but it won't remove—and it will still charge you for—Microsoft Office.

In fact, the only times you'll find non-Microsoft products preinstalled on a PC are when you're buying from a smaller vendor. Microsoft charges one second-tier PC vendor we spoke to (on the condition of anonymity) over \$150 for Office 97, while (according to PC vendors and analysts speaking confidentially) larger customers like CompUSA, Dell, and Gateway pay \$100 or less.

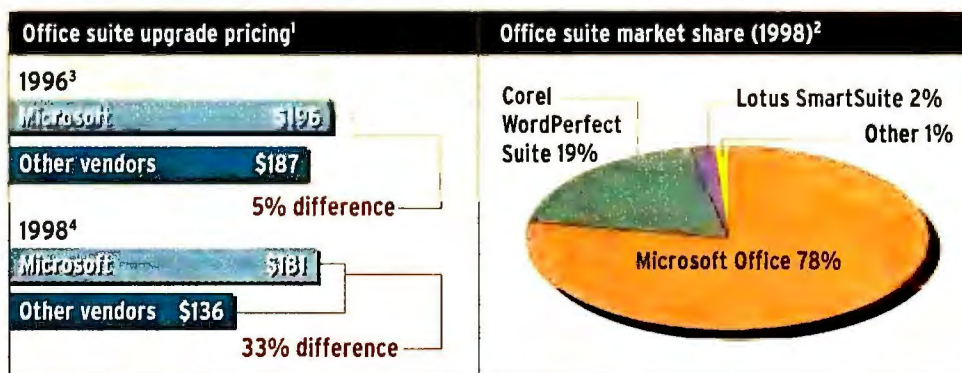
To be able to offer consumers a \$1500 computer on a par with those of its larger hardware rivals, the second-tier vendor we spoke to preinstalls Lotus's SmartSuite on its sys-

2.1GB hard drive these days for \$100 or less; you couldn't buy a 20MB drive for that much in 1990. Murray says that such trends don't apply to OSes. "The cost of the plastic

loomed from 3.1 percent to 11.8 percent during the same period. Which is one reason the Federal Trade Commission is investigating Intel's alleged anticompetitive behavior.

## Microsoft Office Always Costs More

FOR YEARS MICROSOFT OFFICE HAS held the lion's share of the market for office suites. Competitors like Lotus and Corel (and formerly Novell) have slashed prices; Microsoft hasn't. Why? It doesn't have to.



<sup>1</sup>Average prices for standard upgrade versions of office suites. <sup>2</sup>Estimated 1998 U.S. retail shipments in units. Source is PC Data. <sup>3</sup>Data came from mail-order ads, January 1996 *PC World*. <sup>4</sup>Estimated prices. Information obtained from *PC World*'s survey of online software vendors, December 1998.

tems instead of Office. (It obtains the suite from Lotus for a mere \$24 a copy.)

## DON'T BE SURPRISED

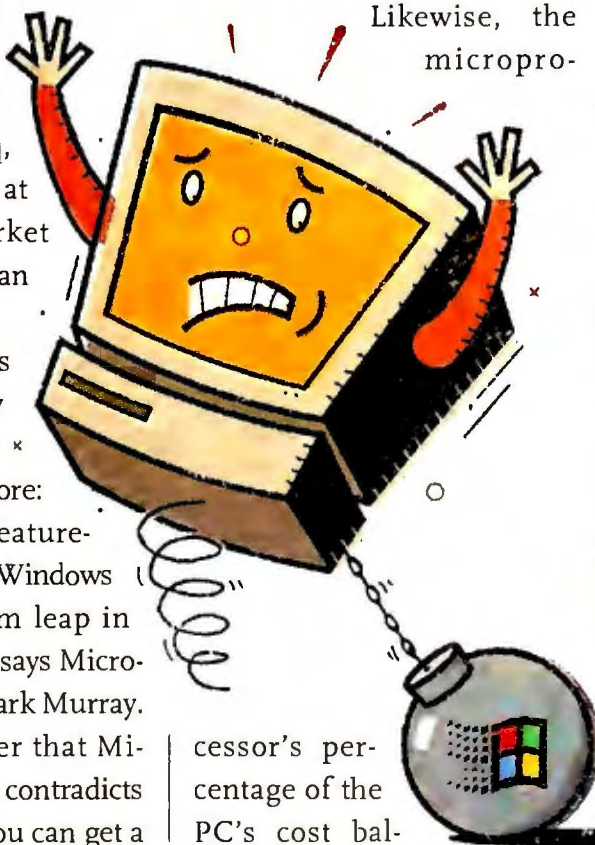
SOME INDUSTRY observers say nothing is surprising about Microsoft's pricing strategies. "Where there's competition, Microsoft prices aggressively and competitively; where there isn't, Microsoft doesn't," says Chris LeTocq, a software analyst at Dataquest, a market research firm in San Jose, California.

Microsoft argues that customers pay more for OSes now "because they get more: Win 9x is more feature-rich than Win 3.x. 'Windows 95 was a quantum leap in terms of features,' says Microsoft spokesman Mark Murray. But critics counter that Microsoft's reasoning contradicts industry trends: You can get a

and the keyboard has dropped, but the cost of hiring programmers has gone up."

Furthermore, Microsoft is not the only company that has raised prices for key PC components. According to Microsoft's memo, Intel's revenue per CPU sold jumped from \$108 in 1990 to \$236 in 1996.

Likewise, the micropro-



cessor's percentage of the PC's cost bal-

## PLUMMETING PRICES

LARGE PC VENDORS defend their decision to preinstall Microsoft products, arguing that standardizing on one OS allows them to trim costs elsewhere and then pass the savings on to consumers. However, according to one analyst, if computer makers let consumers choose an office suite for their PC, the prices of suites would plunge. "For the

chance to build market share, Lotus and Corel would just about give their software away," says the analyst, who wished to remain anonymous.

Microsoft has contended throughout its trial that high technology is a tough business and that rivals like Apple, America Online, Intel, Netscape Communications, and Sun Microsystems behave in the same way when given the chance. Unfortunately, the business can be tough on consumers as well. Should PC buyers be paying less for Microsoft products? Should they have more choice? Lawyers on both sides of the Microsoft case can and will continue to argue about the "shoulds." However those arguments are resolved, one thing is clear: Consumers are paying higher prices for, and have less choice in, software products than they would if Microsoft didn't dominate that market.

—Jeffrey Rothfeder ►



## THE SONY VAIO® 800 SERIES

### 3MAX™

- **Maximum Mobility**—1.75 inches thin and 5.9 pounds light
- **Maximum Screen**—13.3" hi-res XGA display
- **Maximum Battery**—4 hours expands up to 8\*
- Intel® Pentium® II processor 300 MHz
- 64 MB SDRAM
- 6.4 GB HD
- 128-bit graphics accelerator
- Built-in Stealth 3D stereo speakers
- V.90 compatible modem
- Removable 2X DVD-ROM drive with DVD movie playback capability



**AND YOU HAVEN'T EVEN SOUPED IT UP YET.**

- Expandable to 192 MB SDRAM
- Expandable to 10 GB with second removable 4 GB HD
- Plug-in battery doubles your computing life up to 8 hours\*

Calling all power-hungry office nomads, The new Sony 800 Series Notebooks are not only loaded with power, they're designed to expand with plug-in hard drives and extra RAM (see specs for details). Underlining all that capacity is their roadworthy 3MAX features, only from Sony. **MaxMobility**, **MaxScreen**, **MaxBattery**. What better way to take some of the sacrifice out of travel?





# SONY

## PCG-818

**\$2,499<sup>99</sup>** Monthly payments as low as \$50.53\*

- Intel Pentium II processor 300 MHz
- 13.3" Active Matrix LCD Display (1024 x 768 XGA resolution)
- 64 MB SDRAM (expandable to 192 MB)
- 6.4 GB removable hard drive (optional 4 GB plug-in 2<sup>nd</sup> hard drive)
- 2X DVD-ROM drive with DVD movie playback capability
- Choose two out of five FREE DVD titles when you order the PCG-818 by 1/31/99\*\*
- V.90 compatible modem

- Built-in Stealth 3D stereo speakers
- High-capacity Lithium-Ion battery
- Remote control headphones
- 128-bit graphics accelerator
- Windows® 98 pre-installed
- Digital touch pad
- Removable drive bay for CD-ROM, floppy disk drive, 2<sup>nd</sup> battery or 2<sup>nd</sup> hard drive

**2 FREE DVD TITLES**  
with purchase\*\*

**FREE 2<sup>ND</sup> BATTERY**  
with purchase while supplies last

## PCG-808

**\$1,999<sup>99</sup>** Monthly payments as low as \$36.09\*

- Intel Pentium II processor 266 MHz
- 13.3" Active Matrix LCD Display (1024 x 768 XGA resolution)
- 64 MB SDRAM (expandable to 192 MB)
- 4 GB removable hard drive (optional 4 GB plug-in 2<sup>nd</sup> hard drive)
- K56flex™ technology modem: V.90 upgradeable†
- High-capacity Lithium-Ion battery

- 128-bit graphics accelerator
- 24X maximum CD-ROM drive included
- Windows 98 pre-installed
- Built-in Stealth 3D stereo speakers
- Remote control headphones
- Digital touch pad
- Removable drive bay for CD-ROM, floppy disk drive, 2<sup>nd</sup> battery or 2<sup>nd</sup> hard drive

**FREE 2<sup>ND</sup> BATTERY**  
with purchase while supplies last

### Order it direct from Sony and get:

- Convenient one-stop shopping, either online or via telesales, for all your Sony computer products and accessories
- Shipping within 24 hours of your order guaranteed††
- Special Delivery Options available§
- 100% Satisfaction Guarantee§§
- 24-hour, 7-days-a-week technical support for Sony PC systems
- Special financing options available
- Limited Warranty: one-year parts and labor (upon registration; 90 days w/out registration; certain restrictions apply)
- 90 days phone support on all bundled software

### 2nd hard drive available for all models:

Expand your hard drive by 4 GB with this optional plug-in drive.

**USE THE SONY CITIBANK® PLATINUM SELECT™ CARD AND GET TRIPLE SONY POINTS TOWARDS SONY MOVIES, MUSIC, ELECTRONICS AND GAMES. APPLY TODAY.**



Sony Card™

## convergence

DEFINED BY SONY.  
REFINED FOR YOU.



The Sony Digital Mavica® Camera

Welcome to Sony VAIO Direct. It's where video, audio and computing converge into stunning digital integration. Because Sony VAIO Notebooks are designed to work with the ever-expanding line of Sony audio/video products.

Take the sleek Sony Digital Mavica Camera (MVC-FD81), the world's only camera that uses a floppy disk as film. Add images or capture short MPEG1 videos on your Sony VAIO Notebook, then e-mail them complete with audio. Now you can not only e-mail someone a "Happy Birthday" greeting, you can sing it for them. The Mavica Camera even has a built-in microphone and speaker so you can voice-memo your shots. XGA picture quality gives you sharp digital images.

MVC-FD81: \$799.00

ORDER IT DIRECT FROM SONY

[www.sony.com/vaiodirect-800](http://www.sony.com/vaiodirect-800)

OR

1 - 8 7 7 - 8 6 4 - S O N Y TOLL FREE

**Sony VAIO Direct™**

Great Products. Great People.

© 1999 Sony Electronics Inc. All rights reserved. Reproduction in whole or in part without written permission is prohibited. Prices and specifications are valid only in the U.S. and are subject to change without notice. Prices do not include applicable sales tax or shipping. Sony VAIO, Great Products, Great People, 3MAX, Mavica and the Sony logo are trademarks of Sony. Sony VAIO Direct and Sony Card are service marks of Sony. Windows is a registered trademark of Microsoft Corporation. Intel, the Intel Inside logo and Pentium are registered trademarks of Intel Corporation. Citibank is a registered trademark of Citicorp. Citibank Platinum Select is a service mark of Citicorp. All other trademarks are trademarks of their respective owners. \*Sony Computer Loan terms: No money down. 15.17% ANNUAL PERCENTAGE RATE (APR) and 12.35% variable rate (7.75% Prime + 4.60% spread), as of December 1, 1998, each subject to monthly increase. The monthly variable rate equals the prime rate published in the "Money Rates" table of The Wall Street Journal on the 1st business day of each month. Changes to rate take effect on the 5th business day of each month and remain in effect until subsequently changed. Eight-year term. On approved credit. The Sony Computer Loan is offered by Servus Financial Corp. \*\*Sony reserves the right to substitute titles based on availability. Please allow 8-10 weeks for shipment to arrive. Offer not valid with any other model. Limit one offer per household. Offer ends 1/31/99. †33.6 Data/14.4 Fax modem with K56flex™ technology. ††Subject to product availability and carrier pickup. §Delivery in the continental U.S. only. Hawaii and Alaska two-day delivery only. §§Shipping charges to and from the customer are not refundable.



## Fast, Vast, and Rewritable DVD-RAM Finally Arrives

### FIRST LOOK

AFTER YEARS of delays, DVD-RAM is finally hitting the market. Creative Labs shipped the first upgrade kit last year; now kits from LaCie and HiVal (both based on Panasonic's LF-D101 drive) and Hitachi's OEM-only GF-1050 drive are available.

The good news is that for about \$500 to \$800, you can buy a DVD-RAM drive that is fast enough to copy 315MB of data in about 12 minutes. These drives are flexible, too: They read and write DVD-RAM discs (as large as 5.2-GB), and can read CD-ROM, CD-R, CD-RW, and DVD-ROM discs.

Unfortunately, the good news is tempered by a slew of gotchas. In testing the LaCie DVD-RAM External SCSI kit and the Hitachi drive, we encountered three disadvantages to upgrading to DVD-RAM. First, DVD-RAM kits could be hard to find for some time. Second, these kits may not include all the hardware you need. Third, and most significant, DVD-RAM drives exist

for now on a virtual island, since the discs these drives create can only be read by other DVD-RAM drives and a few newer DVD-ROM drives. The DVD-ROM drives most people have in their PCs today won't be able to read DVD-

results: The Panasonic LF-D101 took less than 11 minutes to complete the transfer, while the Hitachi GF-1050 finished in just under 13 minutes. In contrast, a typical CD-RW drive spinning at 2X speed (or 300 kilobytes per second)

ing of 2.1X. (The first DVD-ROM drives transferred data at 1.385 MBps, thereby establishing the 1X DVD standard; all DVD "X" ratings are based on multiples of that.) Though the latest DVD-ROM drives achieve 5X DVD playback, no DVD titles are optimized for such high speeds. The Panasonic's 13.5X rating for playing CD-ROM discs beat out the Hitachi's 8X speed; each of



AMONG THE FIRST DVD-RAM PRODUCTS to arrive: An upgrade kit from LaCie (left) and Hitachi's OEM-only drive.

RAM discs at all. Moreover, DVD-RAM drives can't create discs in CD-ROM, CD-R, or CD-RW formats, so you can't share archived data with anyone who relies on them.

### FASTER THAN CD-RW

THE NEW DVD-RAM drives are certainly fast. To measure recording speed, we copied 315MB of multimedia files and programs from the hard drive of a Dell Dimension 333c PC to each DVD-RAM drive. The

takes roughly 18 minutes to transfer the same amount of data. Both the Hitachi and the Panasonic drives restored our 315MB of test data to the hard drive even more swiftly—in less than 5 minutes.

Using TestaCD Labs' DVD Tach and CD Tach benchmarks, we next measured how fast the new units played DVD-ROM and CD-ROM discs. When spinning DVD-ROM discs, both drives earned a perfectly adequate speed rat-

these drives' speeds is entirely in line with its manufacturer's specifications.

### SLOW TO MARKET

BUT YOU CAN'T GET those speeds if you can't find the drives—and so far, DVD-RAM drives are coming to market slowly. Currently, only Creative Labs, HiVal, and LaCie sell DVD-RAM upgrade kits, all based on Panasonic's drive; at press time, the Hitachi drive was unavailable in a retail kit. Both drive makers are negotiating with other kit vendors.

And kits are the only way you're going to get a DVD-RAM drive today: They won't be standard equipment in new PCs anytime soon. For one thing, they're too expensive, costing PC vendors two or three times as much as CD-RW drives to include in a system. More importantly, ►

### DVD-RAM DRIVES

### SUMMARY

## The Positive and Negative Spins on DVD-RAM

PROS	CONS
New storage format lets you record to and read 2.6GB (single-sided) and 5.2GB (double-sided) discs.	The first DVD-RAM drive kits—from Creative Labs, HiVal, and LaCie—cost \$500 to \$800.
DVD-RAM drives record 40 to 60 percent faster (400 to 475 KBps) than 2X (300-KBps) CD-RW drives.	The first drives require SCSI adapters, but the first kits may not include them or other needed hardware.
DVD-RAM drives read CD-ROM, CD-R, CD-RW, and DVD-ROM discs.	The drives create discs that only other DVD-RAM drives and the newest DVD-ROM drives can read.



# Simply the BEST



**BYTE BEST**

**The QMS *magicolor* 2.**  
**The Best Color Laser Printer.**

\*All prices in US dollars

©1998 QMS, Inc. QMS, the QMS logo, and *magicolor* are registered trademarks of QMS, Inc. All other trademarks or registered trademarks are the property of their respective manufacturers.

Circle 197 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

## Editors' Choice Award — The QMS® *magicolor* 2 CX

"Color laser printers have now become affordable enough that some small offices can deploy one as their only shared printer. None exemplify this more than our Editors' Choice in this category, the QMS *magicolor*® 2 CX."

— PC Magazine, May 1998

## Best Overall — The QMS *magicolor* 2 CX

"QMS's relatively low-cost *magicolor* 2 CX makes a clean sweep in all categories, including best-overall, best-quality, and best-value color laser printer."

— BYTE Magazine, April 1998

## The Best Business Printer — The QMS *magicolor* 2 CX

"The QMS *magicolor* 2 CX speeds along at 4 pages per minute in full color—16 ppm in black and white—providing unprecedented performance in an under \$4,000 color laser printer."

— Macworld Magazine,  
January 1998

**The QMS *magicolor* 2**  
**Best Quality.**  
**Best Performance.**  
**Best Price.**



**QMS *magicolor* 2 family**  
**starting at**  
**\$1,799\***

**QMS**

**1-800-49-COLOR**  
**[www.qms.com](http://www.qms.com)**



DVD-RAM drives—like CD-RW drives—lack widespread appeal. PC vendors say they'll include DVD-RAM drives only in specialized configurations, such as graphic design workstations or corporate mass-storage file servers.

## EXTRA HARDWARE REQUIRED

IF YOU DO buy an upgrade kit, be warned: It may not contain everything you need to get the drive up and running.

For example, the LaCie kit we looked at came with the drive, cables, one 2.6GB DVD-RAM cartridge, and software, but it didn't include a SCSI adapter, which the drive requires. (Creative Labs' DVD-RAM kit does include a SCSI card.) We used Initio's PCI-based FastSCSI-2 I/O Highway board to test the LaCie kit and the Hitachi drive.

Also, if you want to play DVD titles, and your PC isn't speedy enough for software

MPEG-2 decoding (most vendors recommend at least a 266-MHz Pentium PC), you'll need to buy an MPEG-2 decoder board. Finally, if you want to record video directly onto your DVD-RAM drive (which vendors say is an important application for DVD-RAM), you'll need compatible video capture hardware.

At least the software shines. LaCie's kit and the Hitachi drive both came with a copy of Software Associates' Write DVD software. Unlike the recording software that accompanies CD-R or CD-RW products, Write DVD integrates itself directly into Windows. The program creates two new drive letters for your DVD-RAM drive, visible from Windows Explorer and My Computer. One of the drive letters becomes activated when you insert any CD media or DVD-ROM disc; the other displays DVD-RAM discs. You can simply drag

and drop files to and from the DVD-RAM disc as you would to and from a hard drive.

## BEST FOR BACKUP

IN THE SHORT term, because DVD-RAM discs are unable to play on today's DVD-ROM or CD-ROM drives, DVD-RAM drives are better suited for backup and archiving purposes than for data sharing. For the latter task, CD-R and CD-RW optical drives remain the devices of choice. As DVD-ROM drives that are capable of reading DVD-RAM media proliferate (products from Hitachi, Panasonic, Toshiba, and others are expected to arrive later this year), DVD-RAM drives will become more widely useful.

But another recordable DVD option looms large on the horizon, a second format called DVD+RW. Championed by the likes of Hewlett-Packard, Philips, Ricoh, and Sony, DVD+RW drives won't work

with DVD-RAM media but will be compatible with DVD-ROM, CD-ROM, CD-R, and CD-RW discs. They'll store a little more data than DVD-RAM cartridges, too (3.0GB per side versus DVD-RAM's 2.6GB). DVD+RW drives should arrive by this summer, priced at about \$600 to \$800.

Given DVD-RAM's shortcomings, our advice is to wait on rewritable DVD technology for now, unless your backup and archiving needs are dire. By the time DVD+RW drives hit the market, we'll be able to see more clearly which optical storage format has the best long-term prospects.

—Dean Andrews ■

## DVD-RAM External SCSI kit

\$799 (street price); LaCie;

800/999-0670; [www.lacie.com](http://www.lacie.com)

PC WORLD INFONET NO. 722

## GF-1050 drive

(at press time, available to OEMs only)

Hitachi America; 800/448-2244;

[www.hitachi.com](http://www.hitachi.com)

# Outside Your Window: MySpace Finds Room at Monitor's Edge

## NEW TECHNOLOGY

THE PIXEL COMPANY really is thinking outside the box: It has created a patent-pending way to put a toolbar just outside the Windows 95/98 desktop.

Pixel will license MySpace to third parties. By the time you read this, a downloadable ver-

sion of the software should be available from Pixel's Web site ([www.thepixelcompany.com](http://www.thepixelcompany.com)). Licensees will use MySpace to place customized toolbars on the desktop—without asking for Microsoft's permission. Early adopters include PC maker Packard Bell/NEC.

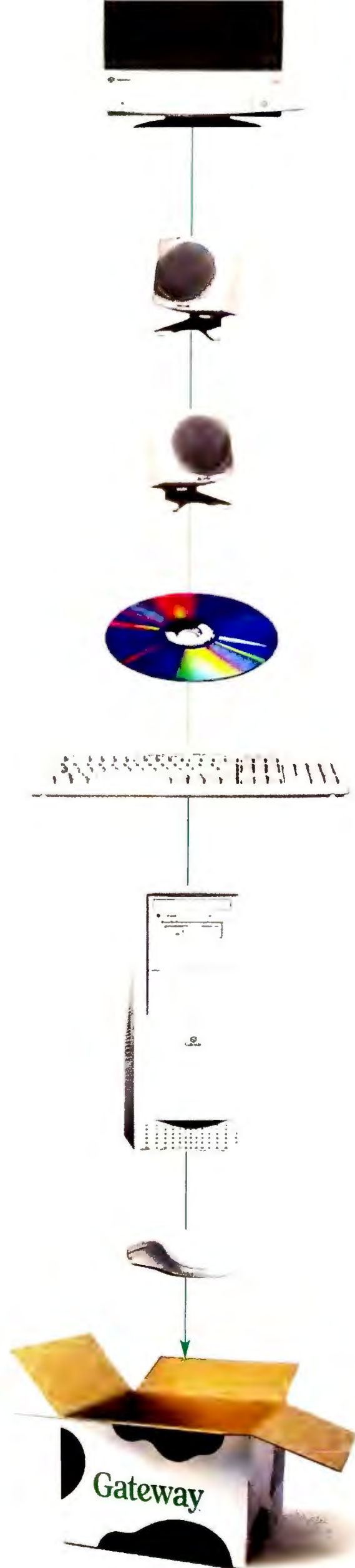
The toolbar holds buttons that launch applications, files, or URLs, and rotates like a rolling pin to display different button sets.

The trick: MySpace exploits a space called the overscan area, about 30 pixels high, along all four sides of the screen.

Last name	First name	Company	B phone	H phone
Nelson	David	Avk	654 4	842 74
Coit	Avk	654 4	323 94	
Tom	Avk	654 4	323 51	
Sap	Packard Bell	916 3		
Woodland	Packard Bell	818 6		
Paul	Avk	654 4	632 30	
Geoff	Avk	654 4	720 08	
Terry	Avk	654 4	364 12	
Michele	Avk	621 6	270 01	
Kushin	Avk	516 3	764 84	
Frank	Renna Horn		(360) 7	
David	Avk	800 6		



Get more out of the box.<sup>SM</sup>







**More muscle.**

**More juice.**

**More room.**

**More RAM.**

**More gigabytes.**

**More glory.**

**More mail.**

**Even more mail.**

**More than one program  
running at a time.**

**More brains.**

**More brawn.**

**More modem.**

**More software.**

**More music. More tools.**

**More for my money.**

**More than I can think of.**

**More.**



\*Call 1-800-GATEWAY or write to us at Gateway Terms & Conditions, P.O. Box 1951, North Sioux City, SD 57049-1951 for a free copy of our limited warranty, on-site service agreements, and installation agreements. If your Gateway technician determines an on-site visit is necessary, on-site service will be provided for product purchased and located in the continental United States, Alaska, Hawaii, Puerto Rico and Canada (excluding mice, keyboards, monitors and Solo portables). On-site and installation services are administered by PC Technology Services, Inc. See agreements for specific terms and limitations. \*\*All prices and configurations are subject to change without notice or obligation. Prices do not include shipping and handling or any applicable taxes. Loan financing available on approved credit through independent lender. Payments based on 48-month term and an Annual Percentage Rate as low as 14.9%. Your APR may be higher. 2% access check fee (\$2min./\$15max.); not applicable to Gateway purchases.



You need more. You want more. You deserve more. And compromise is not an option. With the G-Series from Gateway, you'll get a computer that delivers what you're craving in a desktop. No less, and lots more. And we'll customize it to run the way you want it to. Plus, with our Your:)Ware program, you can trade it in toward the purchase of a new one after two years.<sup>1</sup> Get a Gateway™ PC. Get more out of the box.<sup>SM</sup>



For the latest prices, call us or visit our web site:

**1-800-555-3009**

**www.gateway.com or visit a Gateway Country® location.**

Ad Code # 10023

### G6-333C

- Intel® Celeron™ Processor 333MHz with 128K Cache
- 32MB SDRAM
- EV700 .28 Screen Pitch 17" Monitor (15.9" viewable)
- 4MB AGP Graphics
- 6.4GB Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive
- 3.5" Diskette Drive
- SoundBlaster® AudioPCI™ 64V
- Boston Acoustics® BA635™ 3-Piece Speaker System
- TelePath® 56K² Internet/Fax Modem
- Micro-Tower Case
- MultiFunction Keyboard & Mouse
- Microsoft® Windows® 98 & MS® Home Essentials® Software
- Gateway Gold<sup>SM</sup> Service\*

**As low as \$37/mo. for 48 mos. or \$1299\*\***

Great Additions:

- KidBuilder Preschool-Kindergarten Software **\$99**
- Family Reference Bundle **\$79**

### G6-400

- Intel Pentium® II Processor 400MHz with 512K Cache
- 64MB SDRAM
- EV700 .28 Screen Pitch 17" Monitor (15.9" viewable)
- 16MB AGP Graphics
- 6.4GB Ultra ATA Hard Drive
- DVD-ROM Drive & MPEG2 Decoder
- 3.5" Diskette Drive
- SoundBlaster AudioPCI 64D
- Boston Acoustics BA635 3-Piece Speaker System
- U.S. Robotics® 56K² Voice Winmodem®
- Mid-Tower Case
- MultiFunction Keyboard & Mouse
- MS Windows 98 & MS Home Essentials Software
- Gateway Gold Service\*

**As low as \$48/mo. for 48 mos. or \$1699\*\***

Great Additions:

- Kid's BackPack™ **\$99**
- Thrustmaster® Top Gun™ USB Joystick **\$49**

### G6-450

- Intel Pentium II Processor 450MHz with 512K Cache
- 64MB SDRAM
- EV700 .28 Screen Pitch 17" Monitor (15.9" viewable)
- 16MB AGP Graphics
- 10GB Ultra ATA Hard Drive
- DVD-ROM Drive & MPEG2 Decoder
- 3.5" Diskette Drive
- SoundBlaster AudioPCI 64D
- Boston Acoustics BA635 3-Piece Speaker System
- U.S. Robotics 56K² Voice Winmodem
- Mid-Tower Case
- MultiFunction Keyboard & Mouse
- MS Windows 98 & MS Home Essentials Software
- Gateway Gold Service\*

**As low as \$56/mo. for 48 mos. or \$1999\*\***

Great Additions:

- Philips® CD-RW (CD Rewritable) Drive **\$225**
- Epson® PhotoPC® 700 **\$599**

### GX-450XL

- Intel® Pentium® II Xeon™ Processor 450MHz with 512K Cache
- 128MB SDRAM
- VX900 .26 Screen Pitch 19" Monitor (18" viewable)
- 16MB NVIDIA™ RIVA TNT™ AGP Graphics
- TV/FM Tuner Card
- 16GB Ultra ATA Hard Drive
- DVD-ROM Drive & MPEG2 Decoder
- Philips CD-RW (CD-Rewritable) Drive
- 3.5" Diskette Drive
- SoundBlaster AudioPCI 64D
- Boston Acoustics Digital MediaTheater 3-Piece Speaker System
- U.S. Robotics 56K² Voice Winmodem
- Tower Case
- MultiFunction Keyboard & Mouse
- MS Windows 98 & MS Home Essentials Software
- Gateway Gold Service\*

**As low as \$100/mo. for 48 mos. or \$3599\*\***

Great Additions:

- Extreme Gaming Software **\$99**

(content suitable for ages 17 and older)

Internet access provided by gateway.net™ for **\$14.95/mo.<sup>3</sup>**





**More mileage.**

**More latitude  
and longitude.**

**More of the earth  
moving under my feet.**

**More graphics.**

**More juice.**

**More bass.**

**More treble.**

**More range.**

**More memory.**

**More for my money.**

**More software.**

**More freedom.**

**More action.**

**More color.**

**More movies.**

**More moves.**

**More.**



\*Call 1-800-GATEWAY or write to us at Gateway Terms & Conditions, P.O. Box 1951, North Sioux City, SD 57049-1951 for a free copy of our limited warranty. On-site service not available for Solo portable products. \*\*All prices and configurations are subject to change without notice or obligation. Prices do not include shipping and handling or any applicable taxes. Loan financing available on approved credit through independent lender. Payments based on 48-month term and an Annual Percentage Rate as low as 14.9%. Your APR may be higher. 2% access check fee (\$2min./\$15max.); not applicable to Gateway purchases.



When you spend more time in transit, you need a portable that delivers more of what you need. Gateway™ portables have all the might and muscle of a desktop PC, at a fraction of the weight. And since we'll customize one just for you, you'll get everything you need, everything you want, and everything you deserve. Plus, with our Your:)Ware program, you can trade it in toward the purchase of a new one after two years.<sup>1</sup> Get a Gateway™ PC. Get more out of the box.<sup>SM</sup>

(Pictured here: Solo 2500, 13.3" Display, 7.1 lbs.)



For the latest prices, call us or visit our web site:

**1-800-555-3009**

**www.gateway.com or visit a Gateway Country® location.**

Ad Code # 10023

#### **SOLO® 2500SE**

- 13.3" TFT Color Display
- Intel® Pentium® Processor with MMX™ Technology 233MHz
- 32MB SDRAM (expandable to 288MB)
- 2MB Graphics Accelerator with 64K Colors
- Integrated 8X min/20X max CD-ROM Drive & 3.5" Disk Drive
- 2GB Ultra ATA Hard Drive
- NiMH Battery & AC Pack
- USB Ports, CardBus & Zoomed Video Support
- NTSC/PAL Video Output
- Integrated 16-Bit Sound & Stereo Speakers
- V.90 56K<sup>2</sup> Windows® Modem
- Casual Case
- EZ Pad® Pointing Device
- Microsoft® Windows 98 & MS® Home Essentials® Software
- LapLink® V.7.5 for Windows 98 & McAfee® VirusScan
- Gateway Gold<sup>SM</sup> Service\*

**As low as \$50/mo. for 48 mos. or \$1799\*\***

Great Additions:

- Port Replicator with additional AC Adapter, 17" Monitor (15.9" viewable), Black Mouse & Keyboard **\$449**

#### **SOLO 5150SE**

- 14.1" XGA TFT Color Display
- Intel Pentium II Processor 233MHz with 512K Cache
- 32MB SDRAM (expandable to 288MB)
- 2.5MB 256-Bit Graphics Accelerator
- 8X min/20X max CD-ROM Drive & 3.5" Disk Drive
- 2GB Ultra ATA Hard Drive
- Lithium Ion Battery with Battery Gauge & AC Pack
- Two USB Ports, CardBus & Zoomed Video Support
- NTSC/PAL Video Output
- Integrated 16-Bit Sound & Stereo Speakers
- V.90 56K<sup>2</sup> Windows Modem
- Casual Case
- EZ Pad Pointing Device
- MS Windows 98 & MS Home Essentials Software
- LapLink V.7.5 for Windows 98 & McAfee VirusScan
- Gateway Gold Service\*

**As low as \$62/mo. for 48 mos. or \$2199\*\***

Great Additions:

- Mini Docking Station with additional AC Adapter, Black Mouse & Keyboard **\$294**

#### **SOLO 3100LS "FireAnt"**

- 12.1" SVGA TFT Color Display
- Intel Pentium II Processor 233MHz with 512K Cache
- 32MB SDRAM (expandable to 160MB)
- 2.5MB 256-Bit Graphics Accelerator
- Integrated DVD-II Drive
- Integrated V.90 Modem
- External 3.5" Diskette Drive
- 2GB Ultra ATA Hard Drive
- Lithium Ion Battery & AC Pack
- USB Port, CardBus & Zoomed Video Support
- Integrated 16-Bit Sound & Stereo Speakers
- Leather Portfolio Carrying Case
- EZ Point® Pointing Stick
- Full-Size Keyboard
- MS Windows 98 & MS Office 97, Small Business Edition plus Bookshelf® 98
- LapLink V.7.5 for Windows 98 & McAfee VirusScan
- Gateway Gold Service\*

**As low as \$70/mo. for 48 mos. or \$2499\*\***

Great Additions:

- Auto/Airline Adapter plus Upgrade to 3-yr. Warranty **\$199**

#### **SOLO 9100XL**

- 14.1" XGA TFT Color Display
- Intel Pentium II Processor 300MHz with 512K Cache
- 128MB SDRAM (expandable to 384MB)
- 4MB SGRAM 3-D Graphics Accelerator
- Removable Combo DVD-II Drive & 120MB SuperDisk™ Drive
- 8GB Ultra ATA Hard Drive
- Two Lithium Ion Batteries & AC Pack
- Two USB Ports, CardBus & Zoomed Video Support
- NTSC/PAL Video Input & Output
- 16-Bit Wavetable Sound & Altec Lansing® Speakers
- V.90 56K<sup>2</sup> Windows Modem
- Deluxe Leather Case
- Port Replicator
- EZ Pad Pointing Device
- External Battery Charger
- MS Windows 98 & MS Office 97, Small Business Edition plus Bookshelf 98
- LapLink V.7.5 for Windows 98 & McAfee VirusScan
- Gateway Gold Service\*

**As low as \$112/mo. for 48 mos. or \$3999\*\***

Great Additions:

- Upgrade to 3-year warranty, Boston Acoustics® BA635™ Speakers, External Black Keyboard & Mouse **\$250**

Internet access provided by **gateway.net™** for **\$14.95/mo.<sup>3</sup>**





## More goodies.

### Peripherals

Epson® PhotoPC™ 700 Digital Camera **\$599**

Epson Stylus® 640 Color Ink Jet Printer **\$199**  
Epson Stylus 740 Color Ink Jet Printer **\$279**

Hewlett-Packard® DeskJet® 895Cse Color Ink Jet Printer **\$399**

Thrustmaster® Top Gun™ USB Joystick **\$49**

APC® Back-UPS® Office Uninterruptible Power Supply (UPS) **\$99**  
APC Back-UPS 500 UPS **\$159**

Sketchboard™ Drawing Tablet (for kids) **\$99**

Kensington® PC Starter Kit **\$39**  
Kensington Saddlebag **\$79**  
kidBoard® Keyboard **\$49**  
Visioneer® PaperPort® 6100 Color Scanner **\$179**

### Software

**Extreme Gaming \$99**  
(Content suitable for ages 17 and older)  
**Quake II™**  
**Hexen™**  
**Battlezone™**  
**Heavy Gear™**

**Extreme Gaming II \$99**  
(Content suitable for ages 17 and older)  
**Unreal™**  
**Forsaken™**  
**Turok® Dinosaur Hunter**  
**The House of The Dead™**

**Learning 2000™ Lifetime Library**  
(Learning 2000 is not affiliated with Gateway 2000, Inc.)  
With system purchase **\$200**  
After point of system sale **\$499**

**KidBuilder Preschool-Kindergarten \$99**  
Reader Rabbit's® Toddler  
CTW/ Sesame Street® Elmo's Preschool  
Reader Rabbit's® Kindergarten  
(Plus 4 more titles)

### More Software

**KidBuilder Grades 1-4 \$99**  
Schoolhouse Rock™ 1st-4th Grade  
Math Essentials  
ClueFinders™ 3rd Grade  
Adventurers  
Slam Dunk Typing™  
(Plus 4 more titles)

**KidBuilder Grades 5-8 \$99**  
The Oregon Trail® 3rd Edition  
Pioneer Adventurers  
Success Builder™: Algebra 1  
Compton's 3D World Atlas™ Deluxe  
(Plus 4 more titles)

**Family Reference Bundle \$79**  
Grolier Multimedia Encyclopedia®  
Mindscape's® World Atlas & Almanac  
National Geographic Really Wild Animals™  
Swinging Safari Explore and Print  
Rand McNally TripMaker™ 1998

**Quicken® Suite 99 \$79**

### Even More Software

**Kid's BackPack™ \$99**  
Lego® Island  
Animaniacs™  
Sonic™ 3D Blast™  
Carmen Sandiego Word Detective™  
Sonic and Knuckles™ Collection

**Microsoft® Professional Resource Suite \$99**  
Bookshelf® 98  
Encarta Virtual Globe 98  
Expedia™ Streets 98  
Expedia Trip Planner 98 Publisher

**MS® Action Titles \$99**  
Age of Empires™  
Close Combat™  
Flight Simulator 98  
Monster Truck Madness™  
DreamWorks Interactive:™  
DILBERT'S™ Desktop Games  
DreamWorks Interactive:™  
The Neverhood™

For the latest prices, call us or visit our web site:

**1-800-555-3009**

**www.gateway.com or visit a Gateway Country® location.**

Ad Code # 10023



**Get more out of the box.™**

© 1998 Gateway 2000, Inc. All rights reserved. Gateway, Solo the Gateway stylized logo, Gateway Country, EZ Pad, EZ Point, Kid's BackPack, TelePath, YourWare and the "Get more out of the box" slogan are trademarks or registered trademarks of Gateway 2000, Inc. The Intel Inside Logo, Intel, and Pentium are registered trademarks, and Celeron and Pentium II Xeon are trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. Many Gateway products are engineered to Gateway specifications, which may vary from the retail versions of the software and/or hardware in functionality, performance or compatibility. All prices and configurations subject to change without notice or obligation. Prices do not include shipping and handling or any applicable taxes. 1. Gateway purchases will qualify for the YourWare program by 1) financing through a Gateway authorized lender; 2) purchasing six months of gateway.net™; and/or 3) buying an additional software bundle. Trade-in available at any time between the first day of the 24th month and the last day of the 49th month after delivery of YourWare product. Trade-in credit is only available if you purchase a new Gateway product. Gateway will give you the average wholesale value on the YourWare product, in good condition as determined in Gateway's sole discretion, using the then current Orion Blue Book or another, similar commercially reasonable industry standard determined by Gateway. Other terms and conditions apply. Call our toll-free number for details. 2. Maximum data transfer rate dependent upon certain variables, including particular modems with which you are communicating, telephone lines, communications software and communications protocols. 3. \$14.95 gateway.net pricing based on 6-month commitment. \$15 fee for early cancellation. \$14.95 for unlimited access not available in all areas.



# LINUXWORLD<sup>TM</sup>

## CONFERENCE & EXPO

### KEYNOTE PRESENTATIONS:

**Dr. Michael Cowpland**, President & CEO, Corel Corporation

**Mark Jarvis**, Senior Vice President of Worldwide Marketing, Oracle

**Linus Torvalds**, Creator of Linux

## On Top of the Wave



Flagship Sponsor:



Flagship Sponsor:



Media Sponsor:



Media Sponsor:



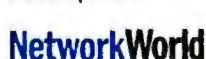
Media Sponsor:



Media Sponsor:



Media Sponsor:



Media Sponsor:



### Introducing LinuxWorld

**Conference: March 1-4, 1999**

**Expo: March 2-4, 1999**

**San Jose Convention Center**

**San Jose, CA**

Now Linux has a brand-new show of its own. LinuxWorld Conference & Expo makes its debut March 1, 1999. It's going to be a blockbuster, because the Linux OS is the most talked-about technology in the IT industry. Attend LinuxWorld at the San Jose Convention Center and prepare to step into your own starring role in this rapidly emerging industry!

Geared to developers, enthusiasts and professional end-users, the Conference program will feature issues and solutions focused on Linux technology. There will be fifteen pre-conference tutorials and over 40 conference sessions. Attendees will include IS managers and decision-makers from Fortune 1000 companies, Linux developers, ISVs, VARs, OEMs and system administrators. The Expo will feature more than 100 emerging companies and organizations dedicated to Linux products and services.

Reserve your seat now! For more information, complete and fax or mail the coupon or visit:

**[www.linuxworldexpo.com](http://www.linuxworldexpo.com)**

On the Web site, you'll get the latest updates, including conference session descriptions, show highlights, the exhibitor list, and more.

**YES!** Tell me more about  
**LinuxWorld Conference & Expo '99**  
in San Jose. I'm interested in

☐ Attending ☐ Exhibiting

Name

Title

Company/Organization

Address

City/State/Zip

Phone  Fax

email

Mail to:  
LinuxWorld Conference & Expo  
P.O. Box 339  
West Bridgewater, MA 02379  
FAX: 508.620.6668  
or Call **800.657.1474**

Owned and Managed by:



**NWW**



**With a SuperDisk™ Drive  
built into your notebook,  
you get more room than Zip.®  
And floppies fly free.**

With a slim SuperDisk Drive built into your notebook, standard floppies and 120MB SuperDisk Diskettes share the same internal drive. So you can leave the add-on hardware behind and really travel light. Check out SuperDisk in Acer, Compaq, Gateway, Hewlett-Packard, IBM, NEC, Toshiba and other great notebooks. If you spend a lot of time on the road, it's the only way to fly. Save a little. Save a lot. Save the world.



Get a  
SuperDisk  
Drive  
built in!

**SUPER 120MB DISK™**

[www.superdisk.com](http://www.superdisk.com)

**1.888.222.2294 ext.120**



SuperDisk, the SuperDisk logo, the SuperDisk and Floppy Disk characters, compatibility symbol, Imation and the Imation logo are trademarks of Imation Corp. All other trademarks are properties of their respective companies. This advertisement does not contain and in no way implies an offer to give away free diskettes. © Imation 1998

 **IMATION**

Circle 119 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# M O B I L E



# KEEP IN TOUCH

**LOOK, MOM, NO OFFICE:** In today's competitive business climate, you go where the business is. Low-cost, high-performance mobile technology helps you stay in touch.

With high-speed network connections and a widening array of mobile devices, it's easier than ever before to get all the information you need—when and where you need it.

WHEN ASKED, "HOW MANY PEOPLE WORK FOR YOU?" Henry Ford reportedly replied: "About half." That's probably as true now as then. Studies reveal that the average productivity for a 10.5-hour workday, including commuting, is around five hours.

That's not enough for highly driven, goal-oriented managers. That's why they're turning to low-cost, high-performance mobile technology that transforms free time into productive time.

In today's competitive climate, operating a successful business often requires you to go where the business is. When you arrive at your destination, you need to have ready access to detailed business records, and that means bringing data with you. New products such as Franklin Electronic Publisher's ([www.franklin.com](http://www.franklin.com)) REX PRO make

PART ONE

# M A N A G E R

FRED COLLINS



## Hardware designed for mobile professionals keeps getting faster, smaller, better, cheaper and friendlier.

it easy and convenient. The 1.4-ounce, credit-card size personal information manager displays crisp text and sharp images and plugs directly into a laptop's PC card slot for fast synchronization with Microsoft Outlook and Lotus Notes.

Another lightweight problem solver is Everex Computers' ([www.freestyle.everex.com](http://www.freestyle.everex.com)) palm-size Freestyle Personal Digital Assistant. Despite its small size, the Freestyle's 16 MB of RAM and optional ProxiNet software, a dedicated graphical online browser, keep you connected to the Internet or your company's intranet.

### AT A DISTANCE

One key to increasing productivity is leveraging the time usually spent commuting or traveling, or eliminating it altogether by having some employees work from home.

"Productivity measurements of employees who work from home or at unsupervised remote sites indicate that most spend between 10% to 15%, and some up to 25%, more time working than do people who work in a traditional office setting," says Jack Gold, an analyst at Meta Group. "If you're sitting home and have a brainstorm, you probably won't do much about it," says Gold. "If you're not remotely connected, chances are you will not drive to the office to follow up. But if you have a computer at home, geography does not constrain you."

Before mobile professionals could achieve an appreciable level of efficiency, however, hardware vendors had to punch up the per-

formance, features, and usability of their products. Software vendors introduced compact versions, as small as 75 KB, of their

flagship database and office automation software. For example, 3Com's ([www.palm.com](http://www.palm.com)) Palm III and Windows CE-based machines can now run enterprise-class software from Oracle, SAP, Sybase, Microsoft, Computer Associates, plus others. The availability of enterprise resource planning software further validates the Palm III and Windows CE devices as true mobile productivity tools.

Fortunately, other products designed to help mobile professionals stay connected adhere to the Immutable Law of Technology: Hardware gets faster, smaller, better, cheaper, and friendlier. Here are some examples:

► Daewoo Industries ([www.dwe.daewoo.co.kr](http://www.dwe.daewoo.co.kr)) flat-panel, lightweight displays are easier on the eyes, especially for extended projects, than the smaller screens that weight-constrained portable equipment typically offers. When used with a docking station, they offer the traveler the best of the mobile and desktop worlds: a compact footprint display with a sharp, color-saturated image.

► American Power Conversion's ([www.apcc.com](http://www.apcc.com)) portable SurgeArrest can help reduce the odds that transient power problems or telephone voltage spikes will damage your equipment. APC reports that nearly half of all data losses are caused by power problems. SurgeArrest installs inline with your laptop's power supply cable to protect your hardware and data. The eight-ounce device works with multiple voltages, making it suitable for use in the



[ FRANKLIN REX PRO ]



[ EVEREX PDA ]



[ IMATION SUPERDISK ]



[ APC SURGE PROTECTOR ]





# If a 6.8 pound projector can influence the entire computer industry, imagine what it can do for your meetings.

**W**hy would PC Magazine rank a humble projector company among the likes of Intel, Microsoft, and the other most influential companies in the computer industry? Good question. They said

of projectors like our revolutionary new 6.8-pound personal series—the ones that earned In Focus an Editors' Choice Award and made us the only projector company on the list. Our personal projectors are so small and

projectors for conference rooms and fixed installations, too. So for projectors that are affordable, reliable, and just plain make you look great, there's really only one choice. The number-one



it's because In Focus is changing the way people use technology; more and more people are projecting from their laptop PCs, making the most of their meetings. They also said it's because

so bright, you can project with the lights on. They've become the preferred choice of people everywhere who present on the road. And we've got a full line of industry-leading

name in projectors—In Focus®. It's your image. Project yourself.™ To arrange a free demo, simply call 1-800-294-6400. Or visit us at: [www.infocus.com/pwd](http://www.infocus.com/pwd)



© 1999 In Focus Systems, Inc. \*Source: PC Magazine Reprinted from PC Magazine September 22, 1998 Copyright © 1998 ZD Inc. All Rights Reserved

Circle 98 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

**InFocus®**  
Project yourself.™



**“Employees allowed to work at home are highly motivated, appreciative, and show it.”** —JACK GOLD, Mobile Technology Analyst, Meta Group

U.S. and Europe.

► Imation's ([www.imation.com](http://www.imation.com)) SuperDisk has a dual personality. In addition to saving and retrieving data on its own special 120 MB disks, its backward compatibility enables you to continue to use your standard 1.44 MB diskettes. SuperDisk drives are now available as a parallel port (external) model as well as an internal version that completely replaces the laptop's 3.5-inch diskette. In either case, the SuperDisk's ability to store up to 80 times more data than the stan-

dard 1.44 MB diskettes allow you to back up vital files easily on the road.

Analysts predict that during the next three years, vendors will continue to integrate once-dis-similar portable and fixed technologies to create ever-smarter devices that will help all employees work faster and smarter. Take Bluetooth, for example. Bluetooth ([www.intel.com/mobile/](http://www.intel.com/mobile/)) is a low-cost, short-range, wireless technology that will link laptops, mobile phones, beepers, PDAs, and other portable devices together in

a “personal network.”

Backed by Intel, IBM, Nokia, and many other vendors, Bluetooth will enable users to connect a wide variety of computing and telecommunications appliances within a 20- to 30-foot range without cables.

Bluetooth, like all advanced portable technology, removes yet another bump from the road that tomorrow's business traveler will traverse. In so doing, it allows business people to concentrate their efforts on their work, rather than the tools. ★

# LOSE WEIGHT .





## PANASONIC'S TOUGHBOOKS

*Rugged outside, robust inside*

THUNK! UH-OH. Your laptop just slipped off your shoulder and hit the ground. Unless you had it safely nestled in one of those bulky laptop carrying cases, you probably just caused some expensive damage or, even worse, lost your data.

Travel and technology will never be perfect partners, so Panasonic ([www.panasonic.com](http://www.panasonic.com)) offers travelers a sleek option: a line of Toughbook laptops that resist the inevitable hazards of traveling.

The six-pound Toughbook's sleek, magnesium-alloy cases are designed to shrug off bumps and bounces that would damage most standard cases. A detachable handle lets you carry the Toughbook as you would a briefcase. The moisture-proof keyboards, touch pads, and LCD panels keep minor spills

from becoming major disasters. On the inside, the units offer extensive protection for your data: All models come equipped with removable, vibration-resistant, Ultra-ATA hard drives encased in a shock-resisting polymer gel.

Beyond protecting your data and your investment, Toughbook delivers robust performance. Panasonic's newest model, Toughbook 71, offers a 300 MHz Pentium II for speedy processing and 64 MB of SDRAM. A crisp 13.3-inch TFT active-matrix display delivers a sharp, clear image indoors and out.

Wireless communications options allow you to use the units for remote network access, E-mail exchanges, and Internet connectivity. Other available options include a CD-ROM and an LS 120 Super Disk Drive.

At one time, similarly equipped laptops cost upwards of \$10,000. Today's Toughbooks not only outperform those early machines but cost less than half that price. ★



PANASONIC TOUGHBOOK

MANAGER  
MOBILE

# FAST!

## MEET REX™ & REX PRO™

The latest technology in organizers.

Less than 1 1/2 ounces. The size of a credit card, and just as portable. Holds everything you need: calendar, phone numbers, addresses, to-do lists, memos, thousands of entries. Works with virtually any PC or laptop. And REX PRO lets you enter data on the go. Includes direct synchronization software for Microsoft Outlook & Schedule+, Lotus Organizer, Symantec ACT!, and Starfish Sidekick. Prices starting as low as \$99. Visit us online at: [www.franklin.com/rex](http://www.franklin.com/rex)



# REX™

World's Smallest Organizer

Starfish Device, desktop and synchronization software developed by Starfish.

©1998 Franklin Electronic Publishers, Inc. Starfish, TrueSync and Sidekick are trademarks of Starfish Software, Inc. ACT! is a trademark of Symantec Corp. Organizer is a trademark of Lotus. Schedule+ and Outlook are trademarks of Microsoft Corp.

Best Buy    Circuit City    CompUSA    Office Depot    OfficeMax    Radio Shack    Sharper Image    Staples



# On the road again

*"Technology empowers me. I have the flexibility to choose when and where I want to do things. The choice is mine."*



**N**OT TOO LONG AGO, A commuter tapping on a laptop keyboard provoked stares of curiosity. Today, it's more of a curiosity to see a business traveler passing time by idly staring out of a plane or train window.

Georgia Saranofsky, director of New York Life's Field Technology Team, Agency Department, spends almost as much time commuting (three hours per day excluding delays) as she does at a desk. To maximize the use of her time and whittle down her workload, Saranofsky routinely carries a laptop computer, beeper, and cell phone to help her transform the "quiet time" during commuting into productive hours. "I don't have the luxury of uninterrupted time in the main office," says Saranofsky.

It's during her long daily commutes that she can test new software programs and tweak the PowerPoint sales presentations she plans to deliver during her monthly visits to New York Life's

**THE WORLD IS HER OFFICE:** Georgia Saranofsky doesn't waste a minute, whether she's commuting to work, rushing to an appointment, or checking in at the office. A laptop computer, beeper, and cell phone keep her connected to co-workers, clients, and family.



branch offices in Dallas and elsewhere.

"The world I live and work in is not 9 to 5 any longer. Staying on top of projects and managing all the things I do requires more time than that. This technology enables me to keep up and helps keep me from getting overwhelmed," she says.

## DIGITAL AT DAWN

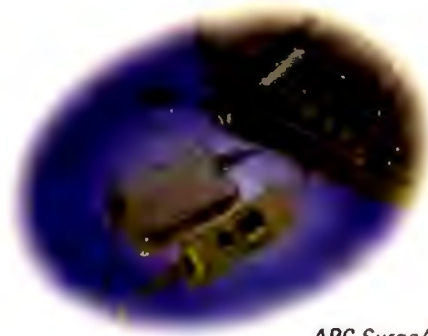
A typical day for Saranofsky starts at 5:30 a.m. "I download my messages before I leave the house and answer them while on the bus." After answering her daily E-mail, Saranofsky reads through company memos and routine interoffice correspondence. "When I get to the office, I connect my laptop to a port replicator and upload my responses and documents to the company's intranet for distribution." With her long commuting hours and busy travel schedule, she uses her Compaq laptop as her primary link to colleagues. "I don't have a desktop computer. At the office I use the laptop for everything."

Her primary software includes a calendaring system with a "nagger" to remind her of pending deadlines, contact management, Microsoft Word, and Presentation. Microsoft Project Manager helps her track and manage the 10 to 15 projects she typically juggles.

In addition to keeping her in



# Six countries in six days.



APC SurgeArrest®  
Notebook Pro

Quaint hotels with pre-war wiring. Phone service that defies all logic. You have critical communications that must get through. Help APC!

APC's new SurgeArrest Notebook Pro Surge Protector keeps notebook computers safe anywhere on the planet. With an innovative multi-voltage design, the Notebook Pro provides laptop computers with "global" surge protection and easy one-time set-up. Just attach and go, to keep your laptop free from bad power in an uncertain world. APC's Excess Current Detection feature warns users of any potential modem damage before connection. For complete AC/telephone line surge protection for notebook computers,

don't leave home without this powerful travel necessity. Purchase APC's SurgeArrest Notebook Pro now, for under \$40.

## Good thing you know how to pack like a pro!



NOTE: The Notebook Pro works with all two prong-style (C-8 connector) adapter blocks, available on most notebook computers. If your notebook does not have such a connector, APC offers the SurgeArrest Notebook for (120Vac only) surge protection.

You can find APC power protection products at:

**MicroWAREHOUSE**  
1-800-345-2045

**Insight**  
INC. 301-217-1773

**COMPUTER DISCOUNT WAREHOUSE**  
1-800-256-4239

### FREE The Complete Guide to Surge Protection.

Learn how to choose the right surge protection for your system.



**Order now** Key Code i584z  
<http://promo.apcc.com>

888-289-APCC x8468 • Fax: 401-788-2797

# APC®

Legendary Reliability™

Circle 28 on reader service card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



contact with colleagues and customers, Saranofsky's collection of portable wizardry keeps her connected to her family as well. That allows everyone who's important in her life to reach her quickly.

### ONE OF A CROWD

Like a true road warrior, Saranofsky never leaves home on business without her ordnance.

"People wonder how it is that I never forget my 'gadgets'." It's simple, I always keep them together and make it a point never to leave them lying around where

As well equipped as Saranofsky is, what more ordnance might she want? "I'd like a personal digital assistant. I know that a PDA would work for me because the sooner I write something down, the more complete and accurate it is." Saranofsky says her company is currently field testing PDAs, but she plans to buy her own. "I can take notes with the laptop, but sometimes, I'd like a PDA because it's smaller and lighter."

One other technology she plans to adopt is an automatic

we interact with our computer systems. Today we look at them as dedicated operations for word processing and other fixed tasks. But look three years into the future, and you will not be able to point to a single device and say 'this is my computer'."

Saranofsky maintains that the cost of acquiring the hardware is more than offset by the increase in productivity and reduced expenses. For example, she rarely uses a hotel's business centers when she travels, preferring to work from her room. "It's more

**"I never knew it would be so easy to connect to people when I need to talk to them. People count on me for fast answers."**

I might forget them." Many of her fellow commuters do the same so none of their commuting time goes to waste. "I'd say that 50% of the people I commute with carry a cell phone, laptop, and beeper. Most of them use them for business, but it's reassuring to have a cell phone handy for emergencies as well."

For all the many benefits of portable technology, it does have a downside. "Customers and colleagues know that I'm always accessible. If I don't call them right back, they wonder why not. Sometimes I can't stop what I'm doing and leave a meeting or disrupt a presentation."

voice transcriber. "I often use a small handheld tape recorder. I'm looking forward to the next generation of these recorders that can translate spoken words into written text." Dictaphone and Olympus have recently introduced such devices, and Sony says it will shortly release one. All three connect to a computer and upload the translated text directly into popular word processors.

Saranofsky's use of multiple devices exemplifies what Jack Gold, a mobile technology analyst at Meta Group, predicts will help shape the future of business travel. "Mobile technology has the potential to significantly change how

convenient and more economical. For example, it typically costs \$4 to have the hotel fax a one-page document. With my laptop, I can attach a Word document and send it as E-mail."

Will the proliferation of technology in Saranofsky's professional life eventually add to the problem instead of the solution? She thinks not. "Without this technology, I probably could not handle all that I do," she reasons. "I think that maybe I could do this job without this technology, but I hope I never have to." ★

### SPONSORS:

MITSUBISHI  
[www.mitsubishi-display.com](http://www.mitsubishi-display.com)

SONY  
[www.world.sony.com](http://www.world.sony.com)

INFOCUS  
[www.store.infocus.com](http://www.store.infocus.com)

NEC  
[www.nec.com](http://www.nec.com)





# TECHNOLOGY

LG makes it work better



## Electronics

WE PUT PEOPLE FIRST

**T**echnology today doesn't stand still. Neither do we. At LG Electronics, we're always working to deliver better products and higher performance. Products like our revolutionary new **Flatron™ monitor**. With its geometrically flat screen, it eliminates distortion and reduces glare up to 25% over conventional flat square screens. Or our high-speed, high-capacity **CD-ROM and DVD-ROM drives**. Or our more powerful, more portable **Phenom Handheld PCs**. At LG Electronics, we have people all around the world making technology more efficient and more affordable than ever before. See how LG is making it work for you. Call 1-800-243-0000 or visit [www.lgeus.com](http://www.lgeus.com).



Circle 96 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)





pentium® II

\*Estimated reseller price to end users for Netfinity 3000 model 847616U includes IBM 4.5GB Hard Disk Drive. Certain features described below are available for an additional charge. Actual reseller prices may vary. For terms and conditions or copies of IBM's standard Limited Warranty, call 1 800 772-2227 in the U.S. Limited Warranty includes International Warranty Service in those countries where this product is sold by IBM or IBM Business Partners (registration required). MHz denotes microprocessor internal clock speed only; other factors may also affect application performance. IBM product names are trademarks of International Business Machines Corporation. Microsoft, Windows and Windows NT are registered trademarks of Microsoft Corporation. Lotus, Domino and Domino Intranet Starter Pack are trademarks of Lotus Development Corporation. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. ©1998 IBM Corp. All rights reserved.

# IT'S NOT BAD BEING THE SMALL FISH.

# IF YOU'RE A PIRANHA.



## THE AFFORDABLE IBM NETFINITY 3000 SERVER

Here's how growing businesses attack the Web. With a Netfinity 3000 server from IBM. It's affordable. It lets you set up reliable networks that run Windows NT® as well as other operating systems. It gets you going on the Web with Lotus® Domino™ or Lotus Domino Intranet Starter Pack™ included. You also get 90-day IBM Start Up Support and a 3-year limited on-site warranty. Plus award winning Netfinity Manager system software. How hungry are you? Visit [www.ibm.com/netfinity](http://www.ibm.com/netfinity) or call 1 800 IBM 7255, ext. 4761

@e-business tools

Pentium® II processor (up to 450 MHz) / Up to 384MB SDRAM ECC memory / From \$2,365\*





**IBM®**



# SONY



By all means, think outside the box. Just put it all back when you're done.





Introducing the HiFD™ system by Sony.  
The new floppy disk and drive that let  
possibilities have priority over limits.

Imagine a single HiFD disk with room for  
140 of the floppies you're using today. That's a  
lot of pie charts, presentations, graphics  
or anything else you'd like to download or save.

Now imagine a drive that plays back at near hard drive  
speeds and still works with your old floppies.  
Amazing? Let's just say nothing else can do this and say  
Sony at the same time.

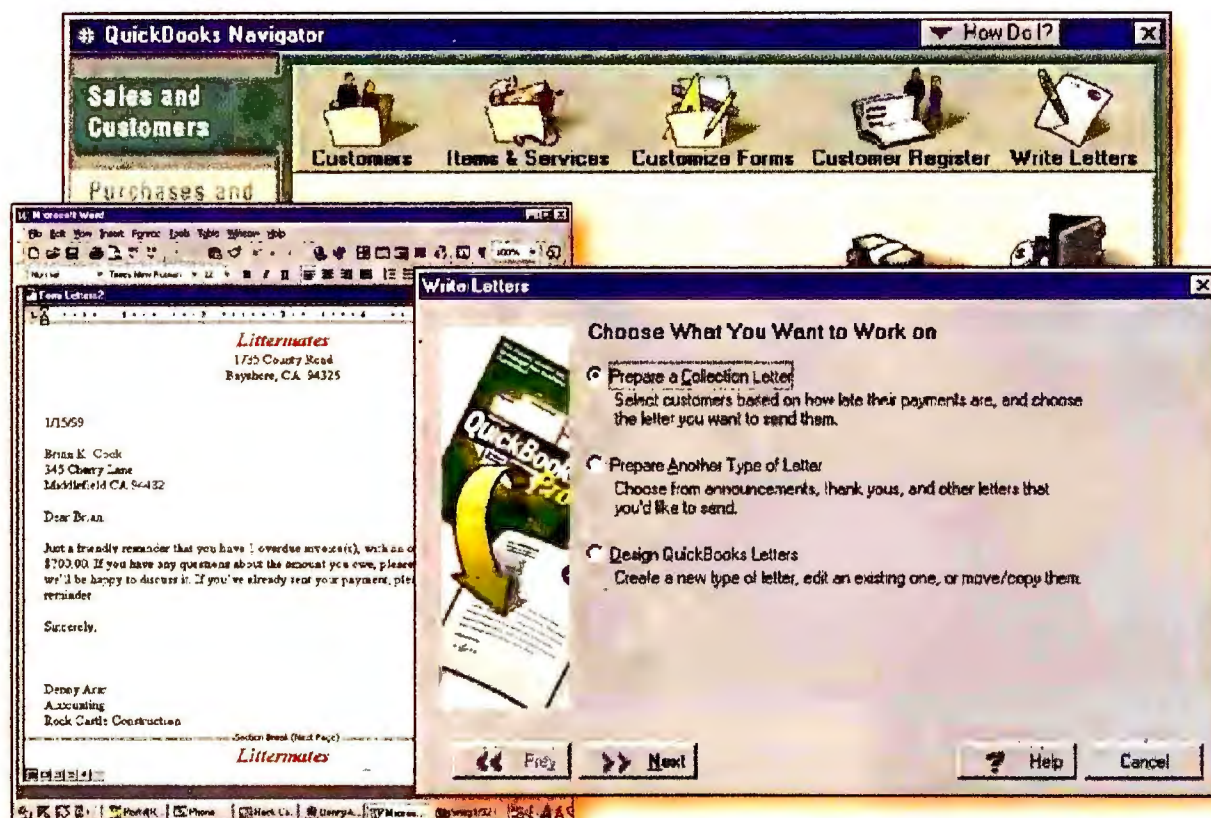


DO WHAT YOU WANT TO DO.™



# NEW PRODUCTS

## QuickBooks Gets the Office Connection



**NAGGING MADE EASY:** QuickBooks Pro 99 users with Microsoft Office 97 can click on a new WriteLetters icon (at right of top screen) to generate mail from a menu (bottom right) using Word's mail-merge feature.

### ACCOUNTING

IF YOU KEEP the books for a small business, you're probably using Intuit's QuickBooks. Its simplicity, power, and attractive design have long made it the runaway market leader. The newest upgrade, QuickBooks Pro 99, simplifies routine tasks for users who also work with Office 97: You can now write letters to customers and turn financial reports into spreadsheets without having to leave QuickBooks.

But QuickBooks Pro 99

arrives only six months after the last upgrade, QuickBooks Pro 6.0, added long-overdue support for multiple users on a network. Why the big rush? Intuit is playing catch-up. Competitors Peachtree and Bestware, which also led the way in networkability, introduced Office integration in their small-business packages last year and the year before, respectively. QuickBooks Pro 99 boasts several other innovations, but anyone who bought last summer's upgrade

should think carefully about whether the added capabilities justify the hefty price tag.

### TAKE A LETTER

THE INTEGRATION with Office allows QuickBooks to do some flashy tricks, including generating letters based on financial information. If, for example, you'd like to send debt collection letters to

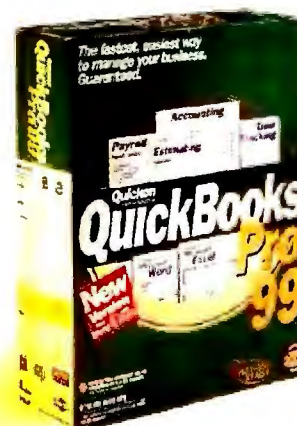
customers whose bills are 30 to 60 days past due, the program will present you with a list of qualifying delinquents. You can edit the list before the program launches Word and performs a mail merge to generate the letters.

You can choose from three prewritten collection letters (friendly, formal, or harsh) or write your own. QuickBooks Pro 99 one-ups the competition by enabling you to produce other types of letters as well—thank-yous for bill payments received, bounced check notifications, contract transmissions, and so on. Or you can create your own templates for mailings to customers, suppliers, or employees.

Integration with Excel lets you turn a QuickBooks report, including formulas, into a new worksheet—or add it to an existing one—with a single mouse click. This is useful if you want to manipulate data in ways QuickBooks can't.

Users who bill by the hour will appreciate the convenience of the new, built-in Stopwatch, which enables you to track time spent on a job by clicking at the start of that job

and again at the end. Previously, you had to import this data from a separate QuickBooks Pro Timer application. (The Timer still comes with the program, incidentally, and it





**QuickBooks Pro 99**

**PRO:** Can create Office 97 letters and spreadsheets from within the QuickBooks program.

**CON:** Expensive for users who just bought the last upgrade.

**VALUE:** Excellent small-business accounting choice. Upgrade worthwhile for those who didn't buy version 6.0; added convenience may justify expense for some who did.

Street price: \$219 (single user); \$599 (five-user pack).

Intuit

800/446-8848

[www.quickbooks.com](http://www.quickbooks.com)

remains useful for employees who don't have QuickBooks on their desktops but who need to generate time sheets.)

Other improvements apply to the \$119 basic edition of the package, QuickBooks 99, as well as to the \$219 Pro version (\$599 for a five-user pack). You can now fill out deposit slips from your keyboard—but you have to order blank slips, with your account information preprinted on them in special ink, from Intuit at a pricey \$35 to \$55 per 250-slip package.

More useful from the standpoint of business accounting: QuickBooks now permits you to track cash back on deposits and attach purchase orders to customer accounts and jobs.

Finally, though QuickBooks 6.0 too is supposed to be Y2K ready, the 99 editions go a step farther by expressing all years

in four digits rather than two.

Satisfied Peachtree and Bestware users will find no compelling reason to switch, but QuickBooks Pro 99 should help keep existing customers loyal—especially those with older versions who were thinking of upgrading anyway. But if you already use QuickBooks Pro 6.0, upgrade only if you need the Office integration and other new business management features.

At least recent upgraders get a bit of a break on rebates: QuickBooks Pro 6.0 owners can recoup \$90 (\$200 for a five-pack), compared to \$70 (and \$100 for a five-pack) for owners of earlier versions.

—Yardena Arar

- 80 QuickBooks Pro 99
- 81 Dell Latitude LT M266ST
- 82 Lexis-Nexis Universe; Aiwa Bolt, Sony SuperStation tape backup drives
- 84 Microsoft MapPoint 2000, ESRI BusinessMap Pro 2.0; MarcoSoft Quo Vadis
- 86 Dragon Systems NaturallySpeaking Mobile; NetZip Deluxe 6.3
- 92 Lexmark Photo Jetprinter 5770, Polaroid ColorShot printer, Syntran CamPrint
- 93 Dazzle Digital Video Creator; SPSS 9 statistical analysis software
- 94 Microsoft Publisher 2000; Symantec Norton 2000
- 98 Cardiff Teleform 6; Benwin Flat Panel BW2000 speakers

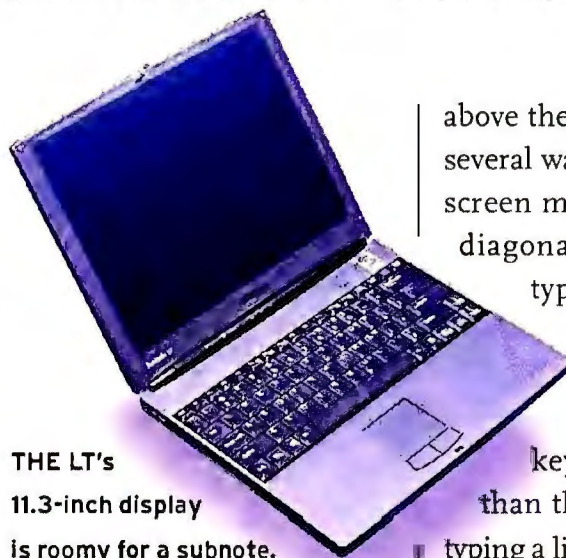
## Dell's Copycat Subnotebook—Nice but Pricey

### SUBNOTEBOOK

IF IMITATION IS the sincerest form of flattery, the Sony VAIO 505 ultraslim subnotebook should be blushing at the slew of knockoffs it has inspired. One of the newest, Dell's Latitude LT M266ST, slightly outdoes the VAIO, but is also a little more expensive.

Like the VAIO and other ultraslims, the Latitude boasts a svelte 1-inch profile, a touch-typable 10-inch-wide keyboard and a Pentium MMX CPU. Its light heft (4-plus pounds with AC adapter and external floppy drive) and its internal modem make it ideal for frequent travelers tired of lugging around a standard 8-pound laptop.

A preproduction unit with a PMMX-266 CPU, 256KB secondary cache, and 64MB of RAM chalked up a PC World-Bench 98 score of 118—about



THE LT's 11.3-inch display is roomy for a subnote.

average for this configuration and plenty fast for running basic work applications. The Latitude's battery life in our tests (1 hour, 51 minutes) was unimpressive for a conventional notebook but fairly typical for an ultraslim subnote. An optional second battery lets you work longer while on the road, but adds nearly a pound to the unit's traveling weight.

The Latitude LT ranks a cut

above the other ultraslims in several ways. Its active-matrix screen measures 11.3 inches diagonally, compared to a typical 10-plus inches (the VAIO 505's is 10.4 inches).

The Latitude LT's keys travel a bit more than the VAIO's, making typing a little easier. Dell's on-site repairs and toll-free tech support for the life of the product beat Sony's service policy.

The Latitude has two deficiencies, though: It ships with Windows 95, not Windows 98. And at \$2299, it's \$300 more than either the Sony or Toshiba's VAIO copycat, the Portégé 3015CT. No matter which ultraslim you buy, you'll probably want to spend another \$299 for an external CD-ROM drive. For that kind



FOR MORE PRODUCT news and the latest announcements, check out the PC World Daily News Service at [www.pcworld.com/news](http://www.pcworld.com/news).

of money, you could buy a bulkier Dell Inspiron notebook with the fastest mobile Pentium II CPU available. More ultraslim portables are on the horizon, so we'd advise you to shop around.

—Vince Bielski ►

### Dell Latitude LT M266ST

**PRO:** Large screen for a subnotebook, usable keyboard, very light.

**CON:** Pricey, CD-ROM drive not included in standard package.

**VALUE:** Costlier than competitors but provides better service and features.

Street price: \$2229

Dell Computer

800/388-8542

[www.dell.com](http://www.dell.com)

PC WORLD INFONET NO. 735



THIS PRODUCT has been evaluated using tests designed by the PC World Test Center.



## Lexis-Nexis Universe: Not Universally Useful

### WEB SITE

LEXIS-NEXIS is a vast network of online databases containing everything from newspaper and magazine articles to legal briefs, financial reports, and public records. But until recently, access to it via the Web could be confusing; and only law offices, libraries, and other institutions with hefty research budgets could afford subscrip-

### Lexis-Nexis Universe

**PRO:** Very easy to use, can easily e-mail search results.

**CON:** Results can be irrelevant.

**VALUE:** Better for financial and legal research than for general news and people profiles.

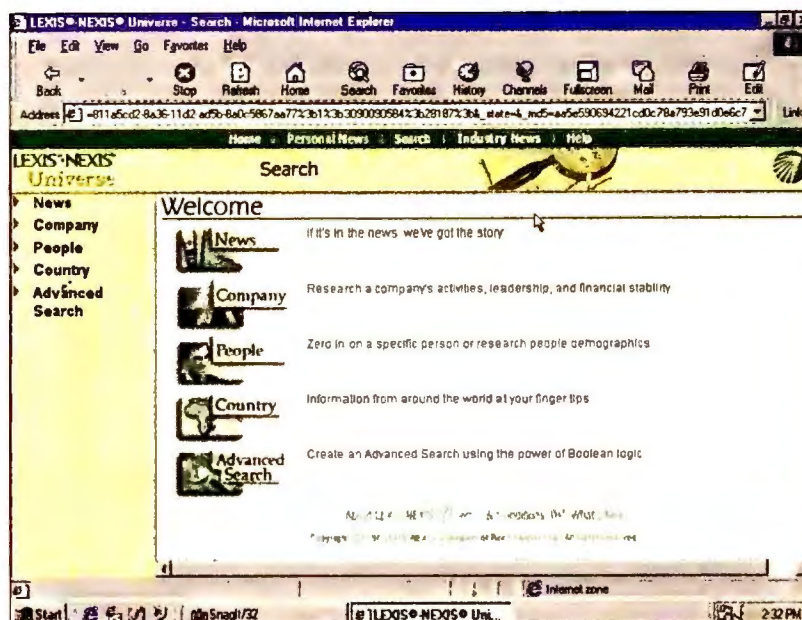
Price: \$55 to \$575 per month for single users; volume discounts apply.

Lexis-Nexis

800/227-4908

www.lexis-nexis.com

PC WORLD INFONET NO. 736



**RESEARCH CENTRAL:** Lexis-Nexis's Universe service offers Web-based access to legal documents, financial reports and general news.

tions, which cost at least \$150 per month. Lexis-Nexis's new Universe service offers cheaper subscriptions and access via a standard Web browser.

For single users, fees start at \$55 per month for access to articles in the News database

going back 90 days. The \$250-per-month account that I tried out provides unlimited access to News, People, Companies, and Countries databases going back at least 25 years.

Results were mixed. On the plus side, Lexis-Nexis clearly

did its Web design homework. The Universe site is simple, pleasingly elegant, and dead-easy to navigate; I could even e-mail my search results directly from the browser.

But the mix of sources can produce unsatisfactory results, at least for general subjects. A search on "Microsoft court" brought up 72 articles on the Microsoft antitrust trial from such diverse sources as the *Irish Times* and the *Seattle Post-Intelligencer*—but nothing from the *New York Times* or the abstracts collection of the *Wall Street Journal*, both of which are listed in the index. Some major magazines aren't represented at all.

Universe might be the way to go for legal documents and public records. But for general research, you'll be just as well off (and a lot richer) sticking with a free search engine like HotBot, Lycos, or AltaVista.

—Bryan Hastings

## Aiwa, Sony Offer Affordable 10GB Backup

### TAPE BACKUP

TODAY'S BIG, inexpensive hard drives can store large programs and tons of data. But with the average hard drive capacity of a new PC now at 8GB, even half-full drives exceed the capacity of many tape backup devices. Two new tape drives—Aiwa's Bolt and Sony's SuperStation—use tapes that can hold nearly 10GB of compressed data. Priced at about \$150 (internal) to \$180 (external)—roughly the same as lower-capacity competitors—they're also eminently affordable.

Both drives come in internal

EIDE and external parallel port models; both use the same Aiwa mechanism; and both come with Seagate's fine backup software for Windows 95, 98, and NT Workstation.

As expected, my shipping Sony parallel port model (with printer pass-through) was the easier model to install; the shipping internal Aiwa drive required a bit more work to set up. I had to open my PC's case, screw in the drive, attach it to the second connection on my EIDE CD-ROM drive cable, and plug in a power lead.

But once installed, the internal Bolt drive worked faster,

taking only 38 minutes to back up my 400MB test drive and a mere 11 minutes to restore the files. In contrast, the SuperStation took about 46 minutes to back up and verify 400MB of files and about 22 minutes to restore them. Both units ran smoothly and quietly.

Each drive is protected by a two-year warranty, but Sony offers buyers longer phone support hours. You can buy storage media in two capacities: 6.6GB (\$25) and 10GB (\$35). Both drives are excellent, so Sony's longer support hours might be the tiebreaker.

—Rex Farrance

### Aiwa Bolt

**PRO:** Affordable mass storage.

**CON:** Support hours could be longer.

**VALUE:** Inexpensively accommodates large backups on a single tape.

List price: \$149 (\$179 external)

Aiwa America

888/297-3004

www.aiwa.com/csd

PC WORLD INFONET NO. 737

### Sony SuperStation

**PRO:** Affordable mass storage.

**CON:** Nothing significant.

**VALUE:** Same storage and performance capabilities as the Aiwa, with longer tech support hours.

List price: \$150 (\$180 external)

Sony Electronics

888/369-0685

www.sony.com/superstation

PC WORLD INFONET NO. 738



# DLP TECHNOLOGY: NOT ONLY CAN YOU SEE THE DIFFERENCE, YOU CAN FEEL IT.



On this hand there is a lighter, brighter choice in display technologies. Digital Light Processing™ (DLP™) technology from Texas Instruments is a revolutionary all-digital technology that enables incredibly lighter and smaller projectors. Unlike conventional LCD systems that contain large, heavy optics, DLP technology allows a smaller, more compact optical system that delivers phenomenal visual impact.

DLP technology has pioneered a whole new class of ultraportables with unmatched brightness. Imagine projectors weighing less than 10 pounds delivering over 600 lumens. Through its all-digital design, DLP technology produces more usable light, achieving higher levels of brightness than traditional LCD systems.



And picture this — the smallest, brightest projection systems on the market deliver graphics so vibrant and film-like you won't believe your eyes. DLP technology's unique digital light displays 16.7 million digitally correct colors. And DLP technology's digital design creates a clearer, seamless image, unlike LCD technologies that suffer from the infamous "screen door" effect.

DLP technology from Texas Instruments. Another reliable semiconductor innovation from The World Leader In Digital Signal Processing Solutions. Now available in ultraportable projectors.

For more information on DLP technology or for a complete list of manufacturers using DLP technology, call us toll-free or visit us on the Web.

**1-888-DLP-BY-TI, ext. 2426**  
**[www.ti.com/dlp/it](http://www.ti.com/dlp/it)**

Texas Instruments Incorporated is traded publicly on the NYSE® under the symbol TXN  
™ Digital Light Processing and DLP are trademarks of Texas Instruments Incorporated6170-011  
© 1998 TI

**OPENING THE WORLD'S EYES TO THE BRILLIANCE OF DIGITAL IMAGES.**

 **TEXAS  
INSTRUMENTS**



## Pictures Not Enough? Draw a Map

### MAPPING

WORDS, GRAPHICS like bar or pie charts, and even emphatic hand gestures aren't always enough to get a point across concisely and powerfully. Sometimes, I feel the need to draw a *map*. Not just any map, but one that makes the geography meaningful. A map that can show me, for example, how many latte drinkers there are compared to smoothie fanatics, by zip code.

Microsoft's **MapPoint 2000** (\$109) and ESRI's **BusinessMap Pro 2.0** (\$130) do exactly that: They combine detailed geographic maps with demographics. You can geographically pinpoint U.S. census data that comes with the programs, or import your own statistics.

#### BusinessMap Pro 2.0

**PRO:** Powerful data mapping capabilities.

**CON:** Ugly maps; limited drawing and annotation tools; full package with extensions is costly.

**VALUE:** Good for heavy-duty, continual mapping; optional extensions expensive but useful.

Street price: \$130

ESRI

800/465-8972

[www.esri.com/businessmap](http://www.esri.com/businessmap)

PC WORLD INFONET NO. 710

#### MapPoint 2000

**PRO:** Easy to use; attractive maps; useful demographic data; affordable.

**CON:** No drawing undo feature; not as data-rich as BusinessMap Pro.

**VALUE:** Good for casual, occasional mapping projects.

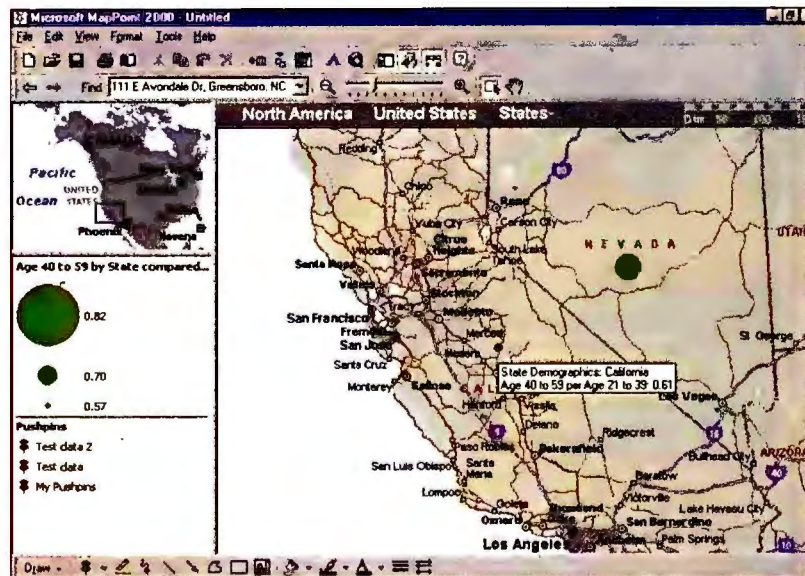
Street price: \$109

Microsoft

800/426-9400

[www.microsoft.com/mappoint](http://www.microsoft.com/mappoint)

PC WORLD INFONET NO. 711



**MAPPOINT 2000 HAS** attractive maps and a familiar Microsoft interface, but its database isn't as robust as BusinessMap Pro's.

The resulting maps are useful for sales projections, expansion planning, and other research projects and proposals. I tested a beta version of MapPoint and a shipping version of BusinessMap Pro.

Microsoft's MapPoint 2000 is an easy-to-use program for those with basic mapping analysis needs. The interface will be familiar to Microsoft Office users, and MapPoint 2000 imports data from Excel, Outlook, Access, and text files, or other programs that support Microsoft Data Link (the Office 2000 counterpart to the ODBC protocol for databases). It also includes a useful demographics database that's derived from U.S. Census Bureau numbers and other sources, letting me do such things as display ratios of age groups by state; compare urban versus rural populations; or get a breakdown of minorities by county.

Once you've assembled your data, the maps are attractive and easy to work with. Drawing tools let you easily add high-

lighting, text boxes, and other annotations; and adding or embedding maps as editable objects in Word, PowerPoint, and other Office files is a snap. Our only major complaint: There's no undo feature.

BusinessMap Pro 2.0 is more powerful than MapPoint 2000, but with all the extra features, it is also more challenging to learn. Other drawbacks: The program lacks the comfy MapPoint 2000 interface; the maps are downright ugly; and its drawing and annotation tools are limited.

#### POWER ADD-ONS

BUT BUSINESSMAP PRO'S two optional extensions put the program, pardon the pun, on the map. Market Analyzer provides a wealth of U.S. demographics, including year 2002 census projections; Business Tracker has a helpful database of 11 million U.S. businesses. Both are included in the four-CD box, but you must call a toll-free number and pay \$350 to unlock the software; unlocking just Business Tracker

### Use a Palm as a Pilot

MAPPING PROGRAMS for PalmPilot devices aren't new, but most only cover large areas with lots of single-screen maps. MarcoSoft's **Quo Vadis** (\$65) lets you scroll through street-level maps for most U.S. locations. Registered users can download all maps free from MarcoSoft's Web site. When you install maps of adjacent cities within a county, Quo Vadis seamlessly connects them like interlocking jigsaw pieces. Global Positioning System support provides real-time location tracking for users with a GPS antenna. You can zoom in and out on maps to show everything from street views to county views. A Palm's tiny memory limits the number of maps that you can store, and the small screen precludes large map views. Still, I found Quo Vadis a handy resource. MarcoSoft; 650/326-4727; [www.marcosoft.com](http://www.marcosoft.com).

PC WORLD INFONET NO. 712

—Michael S. Lasky

costs \$50. You can import data from most common contact managers, databases, and spreadsheets, including Excel. Unfortunately, Outlook and the current version of Access are not supported in their native formats.

I would recommend MapPoint 2000 for those with basic, occasional mapping needs: It is inexpensive and easy to use. However, if you need to map data often for analysis or presentations; could use a wealth of ready-made statistical information; and aren't afraid of complex software programs, then BusinessMap Pro and its extensions are a worthwhile, if hefty, investment.

—James A. Martin ►





**Forced to settle for  
black and white presentations?**

**Get the super-fast 8 ppm\*  
OKIPAGE® 8c Series  
digital LED color presentation  
printers.**

**Wow!** Color printing at about 8 ppm!\*  
With the OKIPAGE® 8c/8cn LED color  
printers, everyone around the office  
can get what they've been waiting for.

Under \$3,500, the OKIPAGE 8c  
Series delivers:

- Single Pass Color™ Digital LED Technology
- PCL 5c, Adobe PS™ 3 emulation—Std.
- True 600x600 dpi full color output
- 32 MB RAM Std./80 MB Max.
- Windows NT® 3.51/4.0; Windows® 98, 95,  
3.1/3.11; MS-DOS® compatible; Mac®  
EtherTalk® NIC option
- 600 Sheet Letter/Legal capacity—Std.
- Supports transparency film, card stock,  
and other media
- Network model with 10/100 Base-T,  
80 MB RAM Std.

**Finish Fast. Finish First.**

**FREE!** "The Power of OKI®  
Color" CD! To request yours  
or to get more information,  
visit [www.okidata.com/8c](http://www.okidata.com/8c) or  
call 1-800-508-9904.



**OKI®**

People to People Technology™

\*Based on rated output speed, source: Buyers Laboratory Inc., Printer Specification Guide, 1998. Does not include file pre-processing time.  
OKI Reg. U.S. Pat. & TM. OKIPAGE Reg. T.M., "People to People Technology" T.M., OKI Electric Industry Co., Ltd., "Single Pass Color"  
T.M., OKI Data Corp., "Finish Fast, Finish First" T.M., OKI America, Inc., PCL Reg. T.M., Hewlett-Packard Company, AdobePS T.M., Adobe  
Systems Inc., Mac, EtherTalk Reg. T.M., Apple Computer Inc., Windows, Windows NT, MS-DOS Reg. T.M., Microsoft Corp.  
Specifications are subject to change without notice.  
©1998 OKidata, A Division of OKI America, Inc. All rights reserved. Printed in U.S.A.



## Speech Recognition for the Road

### SPEECH RECOGNITION

DRAGON SYSTEMS' new \$249 dictation package, **NaturallySpeaking Mobile**, lets you do your talking while you're walking. It combines a pocket voice recorder and NaturallySpeaking voice recognition software. You create, edit, and format documents by dictating into the recorder. Once back in your office, you connect the recorder to your PC's serial port and download your dicta-

### NaturallySpeaking Mobile

**PRO:** Easy to use recorder, great for downloading dictation to a PC.

**CON:** Initial accuracy is spotty.

**VALUE:** Convenient for dictating drafts and notes while traveling.

Street price: \$249

Dragon Systems

800/437-2466

www.dragonsys.com

PC WORLD INFONET NO. 713

tion; the software then transcribes it into editable text.

As with most speech-recognition products, you have to begin by training it. I spent 20 minutes reading book excerpts into a preproduction version of NaturallySpeaking Mobile before using it to dictate e-mail, letters, and reports at my office, an airport, and a trade show.

Dragon says the recorder's compression of audio files hampers the software's speech recognition ability, at least initially, and my tests bore this out. While both recorder and software were super-easy to use, accuracy was disappointing at first. Scores of words were botched—"thanks" was interpreted as "flanks," "Lisa



Leno" as "let me know," and so on. The software understood most instructions ("new paragraph," "scratch that"), but it had problems with formatting requests like "bold that." Two more 20-minute training sessions improved accuracy, as did my editing

DICTATE NOW,  
TRANSCRIBE  
LATER with  
Dragon's new  
voice  
recorder  
package.

corrections. But it took a month of use for the product to become truly convenient.

You'll need at least a Pentium-133 computer with 32MB of RAM (I had a Pentium II-450 with 128MB of RAM). The chic 4-ounce recorder runs on two AAA batteries. Dragon also bundles a copy of NaturallySpeaking Preferred, its excellent \$160 desktop dictation program (see "Can We Talk?" January, [www.pcworld.com/jan99/talk](http://www.pcworld.com/jan99/talk)).

People who want to take notes or write drafts on the road will find Dragon's mobile product convenient, so long as they're prepared to do a fair amount of editing later. But for more formal work—like dictating letters—NaturallySpeaking Mobile has some catching up to do to keep pace with more advanced desktop programs like NaturallySpeaking Preferred.

—Aoife McEvoy

## NetZip Deluxe: Quick Web Unzip Fix

### UTILITY

I'LL BE HONEST. I use WinZip all the time—not because it's the most feature-packed compression utility, but because I've always used it. Software Builders' **NetZip Deluxe 6.3**, which adds such features as the ability to resume an interrupted download, could break my WinZip habit. I tested a shipping version.

NetZip (\$30) offers WinZip's ease of use, intuitive interface, and support for multiple compression formats—and adds a lot of functionality for a bit more money (WinZip costs \$22 apiece for two to

nine licenses). The interrupted-download feature alone is worth the extra 8 bucks: If your Internet connection breaks during a download, NetZip lets you pick up where you left off, rather than having to restart from scratch. This feature works in conjunction with your browser for any Web download. Other utilities—GetRight and Download Butler, for example—can do the same but don't have NetZip's other attractions.

NetZip also simplifies the download-unzip drill. Click on a compressed file, and NetZip launches automatically, show-

ing the download's progress and displaying the archived files in your browser. When the download is done, you can immediately view, extract, and/or launch the archived files. (WinZip doesn't work directly through the browser.)

Like WinZip, NetZip lets you compress and decompress files to save on storage space or to e-mail compressed attachments. And as with Mijenix's ZipMagic, files in a NetZip archive look and act as if they were in Windows Explorer: You don't have to open up a compression utility just to use the files inside.

WinZip 7.0 is more customizable than NetZip, but NetZip's superior functionality makes it a good deal, even at its higher price. I only wish it came with better documentation than the included help files and FAQs.

—Cameron Heffernan ►

### NetZip Deluxe 6.3

**PRO:** Resumes broken Internet downloads; downloads and unzips files in one step.

**CON:** No product manual.

**VALUE:** A time-saving utility that's easy to use.

Street price: \$30

Software Builders Int'l

800/432-0025

www.netzip.com

PC WORLD INFONET NO. 714



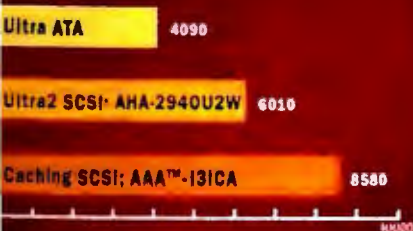
YOUR PENTIUM II WORKSTATION IS ON

SIMMER.

SCSI WILL CRANK IT TO A

ROLLING  
BOIL.

### SpecSCSI



Performance data: Ziff-Davis  
WinBench 98 High-End Disk WinMark  
core, running in Windows NT® on a  
300MHz Pentium II with 64MB of RAM.\*

You want a Pentium II workstation because you want performance, but don't stop there. Add Adaptec® SCSI and make the processor really cook. Adaptec's new Ultra2 SCSI adapter gives you a 47%\* jump over the fastest Ultra ATA solutions. Or choose our caching SCSI adapter for a 110%\* boost. Either way, spec SCSI on your PC and really turn it up. Visit us on the Web at [www.GoSCSI.com/boil/pcw](http://www.GoSCSI.com/boil/pcw), and see the impact Adaptec I/O can have on your workstation. Or call 1-800-804-8886, ext. 5543 and find out how to get things really cooking.

\*Visit our Web site for complete details. © 1998 Adaptec, Inc. All rights reserved. Adaptec, the Adaptec logo, the Adaptec tagline, AAA, and Bandwidth by Adaptec are trademarks of Adaptec, Inc., which may be registered in some jurisdictions. Windows NT is a registered trademark of Microsoft Corporation, used under license. All other trademarks are property of their respective holders.



*We move the information that moves your world.™*

**adaptec®**







**One platform.  
5,832 configurations.**









**One platform.  
5,832 configurations.**





**Infinite  
possibilities.**



# Introducing the Tecra™ 8000, Toshiba's most configurable notebook. Ever.

## **Longer product life, lower cost of ownership**

Your needs may change, your hard drive or memory requirements may change, but the Tecra 8000 product platform never will. It's never been easier to upgrade and lower your cost of ownership so intelligently.

## **Qualify one, you've qualified them all**

One single platform with a consistent motherboard, chipset, memory subsystem, system BIOS, graphics controller and audio/video controller means qualifying once. And only once.

## **Consistent components to protect your investment**

Consistency means fewer spare parts. Less training. Reduced service time. Even backwards compatibility with existing Toshiba docking stations, port replicators and other key accessories.

## **Manageability for seamless enterprise integration**

Toshiba has built proprietary notebook-specific features into LANDesk® Client Manager 3.3 for improved manageability—like fault management, system diagnostics and remote and local system monitoring, configuring, and updating. The configurable Tecra 8000 also offers DMI 2.0 BIOS support for asset tagging and system identification. As *PC Magazine* recently raved, the newest Tecra is "notebook nirvana."

## **5,832 configurations. Simply mix and match from these options.**

**THREE INTEL PENTIUM® II PROCESSORS:**  
233MHz, 266MHz or 300MHz

**THREE TFT ACTIVE-MATRIX COLOR DISPLAYS:**  
12.1", 13.3" or 14.1" dia.

**THREE HARD DRIVES:**  
4.0, 6.4 or 8.1 billion byte Ultra DMA hard drive

**SIX MEMORY OPTIONS:**  
32, 64, 96, 128, 160 or 256MB high-performance  
Synchronous DRAM

**SIX MODULAR BAY OPTIONS:**  
Diskette drive; 24X\* CD-ROM; DVD-ROM;  
optional secondary HDD; optional second battery or,  
for traveling even lighter, nothing at all.

**TWO MODEM OPTIONS:**  
Built-in K56flex™ modem with DSVD (V.90 upgradeable);  
or no modem, if you prefer to standardize your own

**THREE OPERATING SYSTEMS:**  
Microsoft Windows® 95, 98 or Windows NT™ Workstation 4.0

**Go configure on-line at [www.toshiba.com](http://www.toshiba.com)  
or call 1-800-TOSHIBA.**

# TOSHIBA

The World's Best Selling Portable Computers.



# Point, Shoot, Print: Digital Photos Get Easier

## DIGITAL PHOTOGRAPHY

DOES YOUR DIGITAL camera keep you tethered to a PC? Sure, you need a computer to edit, e-mail, or post your digital photos on the Web. But three new products let you make quick printouts without hooking up cables and opening your images in a graphics program first—in short, without using a PC.

Syntran's \$150 **CamPrint**—a device about the size of your jacket pocket—connects compatible digital cameras directly to a printer. Push a few buttons to select photos and size; a switching device lets CamPrint and your PC share a printer. Yes, the idea is clunky—what, another gizmo, more cables? But my shipping version worked fine, even with my Olympus D-500L, which wasn't among the 22 cameras CamPrint officially supports.

More elegant in conception and execution is Lexmark's \$349 **Photo Jetprinter 5770**, a standard ink jet printer outfitted with an LCD-equipped control panel, slots for SmartMedia and CompactFlash memory cards, and a Zip drive adapter. Slip your camera's

media into the appropriate slot, then use the LCD settings to produce thumbnails, select images to print, and even add a few hokey special effects. Print quality of photos that I made using a shipping unit looked fine on ordinary ink jet paper, and striking on Lexmark's Inkjet Photo Paper.

Finally, Polaroid's \$299

hard-to-find ColorShot stock that delivers the same quality. Direct Connect wasn't ready for testing, but I tried a shipping version of the printer with a parallel port connection (a USB version is also available).



**TWO PATHS TO PC-FREE PHOTO PRINTS:** Syntran's Camprint (top) works with a printer; Lexmark's Photo Jetprinter 5770 stands alone.

**ColorShot** printer with the company's \$99 Direct Connect accessory will let you print straight from your camera to the company's widely available, \$1-a-shot Spectra Instant Film or its slightly cheaper but

The advantage of printing digital photos on a Polaroid-media printer instead of using a Polaroid camera? You can print images from the Web or from other sources. And because a digital camera, unlike

a Polaroid camera, saves images, you can make multiple copies or edit them on your PC. But if you dislike heavy, old-fashioned 3½-by-2½-inch photos of conventional Polaroid cameras, you won't like ColorShot prints either—and



the small-format printer isn't really good for much else.

Each of these products eliminates the need for a PC to print digital photos. The CamPrint is the quick, easy, and relatively inexpensive fix—if you're happy with your current printer and if it supports the device. Polaroid's package may please fans of Polaroid photo who want to go digital. But if you plan to buy a printer anyway, Lexmark's integrated system makes the most sense, combining a good general-purpose printer with a digital-photography studio. You don't even need to attach your camera to it, because photos travel on wafer-thin flash cards.

One disadvantage, however, applies equally to all three of these products: They require AC power. That means you can simplify the process of getting to your images, but if you need the photos while you're out in the field, then a conventional Polaroid-style instant camera may turn out to be a more practical option.

—Dan Littman ►

### CamPrint

**PRO:** Connects a printer and digital camera, lets you print photos without using a PC.

**CON:** Adds more cables and a power cord to your desktop.

**VALUE:** Convenient, fairly priced gadget for quick digital photos.

Street price: \$150

Syntran Color Imaging

408/573-1788

www.syntran.com

PC WORLD INFONET NO. 715

### ColorShot

**PRO:** Used in conjunction with the Direct Connect accessory, lets you print photos without a PC.

**CON:** Small-format printer; highly specialized.

**VALUE:** Most people may prefer a conventional Polaroid camera.

List price: \$299

Polaroid

800/343-5000

www.polaroid.com

PC WORLD INFONET NO. 716

### Photo Jetprinter 5770

**PRO:** Versatile, high-quality printer enables you to generate photos without a PC.

**CON:** Special-effects features are on the hokey side.

**VALUE:** Elegant and speedy photo-printing on a solid, all-around ink jet.

Street price: \$349

Lexmark Int'l

800/539-6275

www.lexmark.com

PC WORLD INFONET NO. 717



# Affordable, Easy Video Razzle-Dazzle

## VIDEO CAPTURE

THE LAST TIME I tried to capture video on my PC, I cut two fingers jamming an ISA card into a free slot, banged my head on a shelf while attaching cables to the back of the box, and force-fed my hard drive so many motion-JPEG files that the system choked.

This time, things were different. With a shipping copy of **Dazzle Digital Video Creator**, all I had to do was plug a cable into my parallel port; I never had to crawl behind my PC again. All video and audio ports (in and out) come in a compact miniature tower that sits right next to my monitor.

Dazzle's software is even more appealing than the hardware. The sleek, intuitive interface looks like an electronic toy, with buttons that call up task-specific control panels for editing video and organizing multimedia clips.

Dazzle captures and saves video from a camcorder, a VCR, or any device with a composite or S-Video connector, in MPEG-1 format—a far more universal and compact video format than motion-JPEG or AVI. The only downside is that MPEG is not as

editable as M-JPEG. Dazzle lets you split MPEG clips, trim them, and splice them together—as long as they're in exactly the same format, down to their bit-per-second processing rates and window sizes. This is easy for clips captured using identical Dazzle format settings; blending in video

from the Web may be difficult.

Beyond cutting and splicing, you can do little editing with Dazzle (the company says the next version will offer more effects). But you can easily share your videos. Click one button to attach a clip to an e-mail message; click another to put it into a simple Web page

ready for posting on your site.

At \$249, Dazzle is one of the most affordable MPEG video capture packages available, suitable for a range of personal and business uses, such as training or Web marketing. Just make sure you get the latest software from the company's Web site: Dazzle released a new version in the middle of my evaluation.

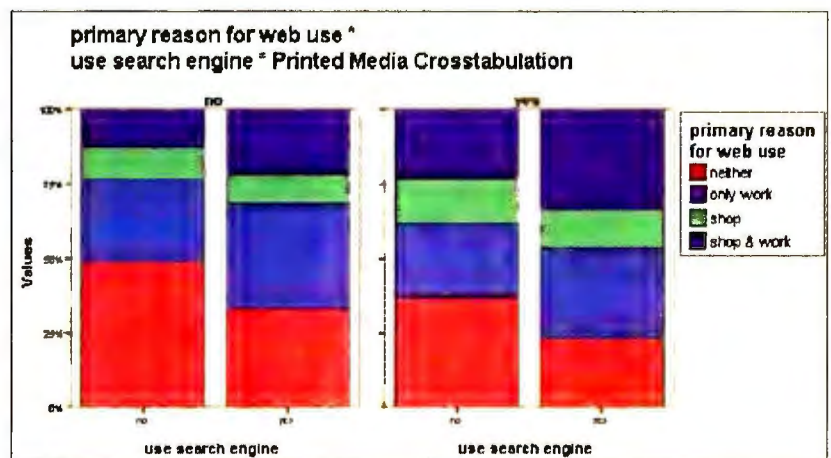
—Brad Grimes

## SPSS 9: Picture-Pretty Statistical Analysis

### STATISTICS

LONG POPULAR with scientists and statisticians, SPSS statistical analysis software in recent years has become useful for businesspeople as well. SPSS 9 (\$795) not only boasts visuals on a par with the best business presentation packages, it also provides wizards for importing all sorts of data and introduces powerful techniques that are moving from statistics cubbyholes into marketing departments. I looked at a preproduction copy.

Graphics, which can now be generated from tables with a few mouse clicks, include basics like the stacked-bar chart shown above. But new options abound. Sophisticated users will appreciate 3D spike charts for a detailed look at a proposed model's fit to data; business users will enjoy creating *USA Today*-style charts with bars made of symbols (flags, dollar signs, barrels, and so forth). Using features from the top-notch graphing program DeltaGraph (which SPSS now owns), SPSS 9 acquires a boardroom look to go with its business smarts.



**STACKING UP:** SPSS's new stacked-bar charts let you summarize and deliver complex statistics tables using an easy-to-read graphic.

SPSS's basic package now includes some advanced statistical topics from its series of SPSS modules (\$495 each). If you're still exploring statistical functions in Microsoft Excel, you may know little about things like multinomial logistic regression. But that function is a powerful business decision-making tool, and it's now part of the basic package. Advanced users should consider the Trends module for forecasting, and Exact Tests (or its industrial-strength companions StatXact and LogXact) for squeezing the most out of surveys and market tests.

Version 9's combination of powerful statistical methods

and graphic output, ranging from austere scientific to trade-show flashy, makes it the only program you need for finding patterns in business data and using them to convince people you're right.

—Charles Seiter ►

### Dazzle Digital Video Creator

**PRO:** Easy-to-use video capture device, great software interface.

**CON:** Editing ability is limited.

**VALUE:** A great way to get MPEG video clips into your PC and then out onto the Web.

Street price: \$249

Dazzle Multimedia

510/360-2300

www.dazzle.com

PC WORLD INFONET NO. 729

### SPSS 9

**PRO:** Impressive business-presentation graphics, best introduction to new applied-statistical methods.

**CON:** Not for casual users.

**VALUE:** Serious but worthwhile investment.

List price: \$795

SPSS

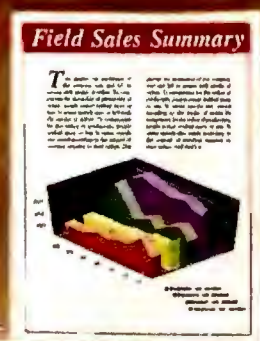
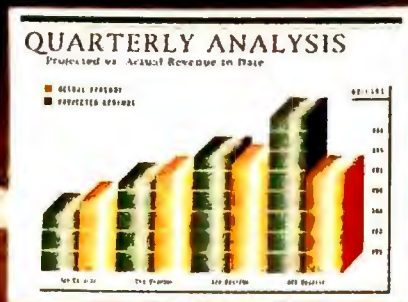
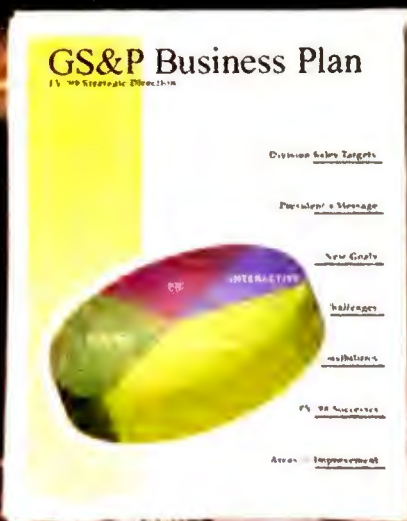
800/543-2185

www.spss.com

PC WORLD INFONET NO. 730



©1998 Hewlett-Packard Company. Estimated U.S. Retail Price.

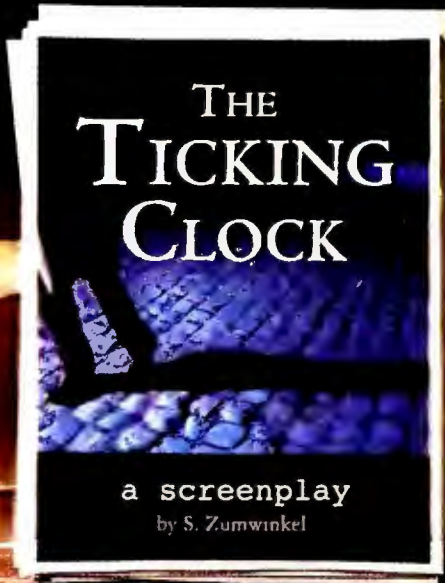


**HP. Better color, no matter what you're printing.**

*Introducing a new family of color printers for the office. All kinds of things are being printed in color these days. Which is why we offer all kinds of color*

The HP Family of Color Printers starts at \$399.





printers, from desktops to departmental workhorses. And to ensure brilliant color, these networkable printers offer our acclaimed Color Layering technology. PhotoREt Color Layering for inkjets. And ImageREt Color Layering for lasers. Affordable? Yes. Reliable? Yes. Website? [www.hp.com/go/officecolor](http://www.hp.com/go/officecolor)



## Publisher 2000 Goes Professional

### DESKTOP PUBLISHING

MICROSOFT PUBLISHER, a popular desktop publishing tool for users with little or no design experience, wants to help you make your documents look more professional. Now in public beta, **Publisher 2000** looks and feels much like the previous version, but it adds tools to help you work

### Microsoft Publisher 2000

**PRO:** Easy desktop publisher now enables use of commercial printing shops by nonprofessionals.

**CON:** The printer must use Publisher 2000.

**VALUE:** Good choice for budget-minded businesses that want to use commercial services for high-quality color printing in quantity.

Street price: \$99; upgrade \$79

Microsoft

800/426-9400

[www.microsoft.com/office/](http://www.microsoft.com/office/)

PC WORLD INFONET NO. 731

with a commercial printer.

Why would you want to do that? A commercial bureau not only can print large quantities far more quickly than an ink jet, but it also can provide much nicer print quality. Until now, these bureaus would accept only documents that were specially prepared for color printing with such high-end programs as Adobe PageMaker or QuarkXPress. With Publisher 2000, you can transfer a project to a Zip disk or other media using a new Pack and Go Wizard, and drop it off at the service bureau. The printer can whip it into shape using Publisher 2000's new Commercial Printing Tools. (Microsoft plans to distribute the program to service bureaus nationwide.)

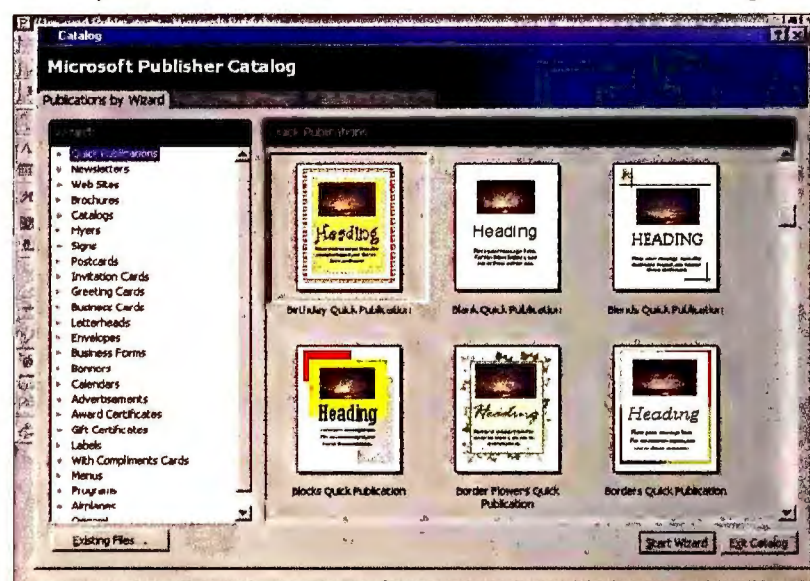
Other improvements: A Measurement toolbar displays a selected object's size and

position, with clickable icons for rotating objects, adjusting text kerning and tracking, and changing line spacing. Publisher's template library now includes 50 new designs for one-page documents and 20 for catalogs and booklets. The program generates automatically bulleted and numbered lists the way Word does. However,

it lacks advanced alignment tools, and you can't open more than one document at a time.

Publisher 2000 will cost \$99 but will come bundled with the Premium, Professional and Small Business editions of Office 2000. It's worthwhile for anybody wanting to use professional printers without hiring a graphic artist or learning a more complex desktop publishing package.

—Richard Jantz



**READY TO GO:** PUBLISHER 2000's new Quick Publications templates offer 50 ready-to-roll layouts for one-page projects.

## Clean Your Clocks With Norton 2000

### YEAR 2000

UTILITIES THAT CHECK to see if your PC is prepared for the much-dreaded year 2000 are a dime a dozen, but why stop there? It's just as important to make sure that your applications and data are secure. I looked at a shipping retail version of Symantec's **Norton 2000**, and found it significantly better than the earlier corporate edition (see "Software to the Rescue," January, [www.pcworld.com/jan99/y2ktips](http://www.pcworld.com/jan99/y2ktips)), which provided cryptic explanations and missed potential problems.

Norton 2000 not only ensures that your BIOS knows what to do on the fateful New Year's Day, it also scans and analyzes applications and files that might contain time-sensitive data. Problem descriptions are in plain English, and the program can change the short-date format in Windows 95, 98, and NT from 2 to 4 digits. These improvements put Norton 2000 on a par with Greenwich Mean Time USA's Check 2000 PC Deluxe, the best of the Y2K packages that we reviewed in last month's issue.

Norton 2000 can't fix incompatibilities, but it does generate reports with suggestions. It excels at reporting potential problems in individual files, right down to specific cells and lines. It even makes color-coded annotations on spreadsheets.

Norton 2000 works with many popular business applications (Quicken, 1-2-3, Fox-Pro, Quattro Pro, Paradox, and Microsoft Access, Excel, Word, and PowerPoint). But it has nothing on home-oriented programs such as Quicken Family Lawyer, Quicken Es-

tate Planner, and Calendar Creator. Still, if keeping the data in your files is a priority, Norton 2000 should definitely be on your shopping list.

—Angela Navarrete ►

### Norton 2000

**PRO:** Easy to use; generates detailed reports on most major business applications.

**CON:** Doesn't catch errors in some home-oriented programs, including Quicken Family Lawyer.

**VALUE:** Useful for finding Y2K glitches in hardware and software. List price: \$49

Symantec

800/441-7234

[www.symantec.com](http://www.symantec.com)

PC WORLD INFONET NO. 732



# HP. Better color, no matter what you're printing.



## **HP DeskJet 895C Color Printer** Featuring PhotoREt Color Layering

- Designed for your office desktop
- 2.5 ppm color,\* 5 ppm black, both in normal mode
- The perfect entry-level business printer. Networkable via optional HP JetDirect Print Server.

\$399



## **HP DeskJet 1120C Color Printer** Featuring PhotoREt Color Layering

- Designed for your office desktop
- 1.5 ppm color,\* 5 ppm black, both in normal mode
- Versatile office printing from post cards to 13" x 19" posters. Networkable via optional HP JetDirect Print Server.

\$499



## **HP 2000C Color Printer** Featuring PhotoREt Color Layering

- Designed for your office desktop or workgroups of up to 5 people
- 3.5 ppm color,\* 8 ppm black, both in normal mode
- Fast, full page color with low operating costs. Networkable option with HP JetDirect Print Server.

\$799



## **HP 2500C Color Printer** Featuring PhotoREt Color Layering

- Designed for workgroups of up to 15 people
- 3.5 ppm color,\* 7 ppm black, both in normal mode
- Versatile mid-volume printer. Prints up to 13"x19" and offers a dual paper tray. Networkable via optional HP JetDirect Print Server.

\$1,249

## **HP Color LaserJet 4500 Printer** Featuring ImageREt Color Layering

- Designed for workgroups of up to 20 people
- 4 ppm color,\* 16 ppm black
- High performance, high volume printing up to 8 1/2" x 14" with optional auto-duplex.

\$2,499



## **HP Color LaserJet 8500 Printer** Featuring ImageREt Color Layering

- Designed for departments of up to 50 people
- 6 ppm color,\* 24 ppm black
- Highest performance, highest volume printer—up to 11"x17" with optional auto-duplex.

\$5,999



## **HP DesignJet 2500CP Color Printer**

- Designed for poster-size printing by networked workgroups
- 2' x 3' color poster in about 8 minutes
- The printer that offers true photo quality images up to 36" wide and ensures brilliant accurate colors and smooth subtle skin tones.

\$11,995<sup>†</sup>



For more information about our family of color printers for the office, visit [www.hp.com/go/officecolor](http://www.hp.com/go/officecolor).



## Cardiff's Soup-to-Nuts Forms Software

### FORMS

THE PAPERLESS office remains an elusive dream. Even if you create all your business documents using a PC, some coworkers will inevitably rely on paper forms. Cardiff's **Teleform 6** software is the handy

#### Teleform 6

**PRO:** Creates and reads paper forms, then links them to computer databases.

**CON:** Not simple to learn; pricey.

**VALUE:** Great for offices that process hundreds of forms daily; otherwise, it's overkill.

List price: Standard \$1495, Elite \$5995

Cardiff Software

800/758-1785

www.cardiffsw.com

PC WORLD INFONET NO. 733

link that helps you manage paper forms in a busy computerized environment.

Teleform is a suite of modules that includes Designer, for creating forms; Reader, for translating paper forms into digital data; and Verifier, for correcting data entries. I examined a shipping version.

Think of the Designer module as a desktop publisher that's optimized to create business forms such as surveys, applications, and orders. The paper forms can accept either hand-printed or machine-printed characters and so-called mark-sense fields (blank circles or boxes filled in with marks as appropriate, such as *M* or *F* for gender). You can also easily convert the file for

your form into an HTML file for posting on the Web—a time-saver if you need paper and Web forms.

The Reader module interprets scanned and faxed images of completed forms. Optical character recognition is never 100 percent accurate, so Teleform passes the data from the Reader on to the Verifier, which highlights questionable characters. After entering the corrections, you can export the information to databases such as Microsoft Access.

Teleform Standard works with forms you design using the software. The Elite version also captures data from existing forms.

New in version 6 are a form wizard that makes it easier to

design forms; more form templates; and a spelling checker. This version is also Y2K compliant, so you'll want it if you plan to use the product in the next century.

Competitor JetForm's similarly priced Design 5.2 offers more design capabilities than Teleform, including greater multilingual support. But JetForm's app is oriented toward electronic forms and doesn't match Teleform's breadth of paper-to-database conversion features.

Teleform, which takes some time to set up and learn, is geared toward businesses that process 100 to 200,000 or more pages of forms per day. If you handle just a couple of dozen forms daily, you're better off sticking with manual data entry.

—Richard Morochove

## Flat Speakers Give Round Sound

### SPEAKERS

NO DOUBT ABOUT IT: Thin is in. Along with flat-panel monitors and slimmed-down notebooks, wafer-thin speakers reflect that dictum.

Despite its name, there's nothing flat about Benwin's \$129 **Flat Panel BW2000** speakers, which deliver rich, full 3D sound. I tested a shipping version. Relying on licensed NXT audio technology, which uses complex vibrations in panels instead of the traditional pushed, pistonlike sound of conventional speakers, Benwin's units do not require enclosures to operate. The panels are mounted on sleek, sculpted plastic stands, and plug into a petite (but not flat)

desktop subwoofer that handles the deeper bass sounds. The subwoofer also includes the volume, tone, and power controls as well as a convenient headphone jack.

While the BW2000 speakers are designed for use with a computer, they can easily be attached to small stereo systems or radios. In my tests on a PC, I found the sound reproduction to be rich and crisp with excellent channel separation, particularly with popular music from audio CDs and the sound tracks of DVD movies. Classical music and some monaural .wav files, on the



**AS SLIM AS IT GETS:** Benwin's Flat Panel speakers are wafer-thin, but their sound is rich and full.

other hand, sounded slightly muddy.

Because the flat-panel technology lacks a "sweet spot," I felt surrounded by sound no matter where I was in the room. And unlike many computer speakers, these devices come with enough cable to separate them by up to 15 feet, to create a truly panoramic soundscape.

With their attractively slim silhouette, which requires lit-

tle desk space, and their long cords, which let you place the units out of the way, Benwin's BW2000 speakers are ideal for cramped desktops—and they're reasonably priced. They will also appeal to the computer user who seeks 3D sound but doesn't want to invest in extra speakers.

—Michael S. Lasky ■

#### Benwin Flat Panel BW2000

**PRO:** Attractive space-saving, paper-thin speakers offer solid sound reproduction.

**CON:** Classical music and some .wav files sound muddy.

**VALUE:** Excellent price for innovative PC speakers.

Street price: \$129

Benwin-Kwong Quest LLC

888/923-6946

www.benwin.com

PC WORLD INFONET NO. 734



# If It Isn't Standard Equipment On Our XL<sup>2</sup>, It Hasn't Been Invented Yet.



**Slim and  
lightweight**  
1 1/2" thin and 7.05 lbs.



**Huge, bright**  
14.1" TFT display  
**16 Million Colors\*\***



**2x AGP Graphics Port**  
for fast 3-D rendering

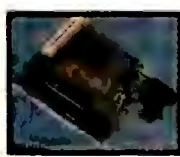
**ATI Rage LT Pro 3-D w/4 MB  
of SGRAM for dazzling graphics**



**2x DVD-ROM (Reads CD-ROM)  
and LS-120 SuperDisk™ Drive  
(Reads floppy disks)–  
both built-in**



**A full 128 MB  
of fast SDRAM–  
Work faster and  
run multiple  
programs at once**



**56k capable\* v.90  
internal fax/modem**



**2-button touchpad  
and pointing stick  
(active simultaneously)**



**Parallel, Serial, 2 PCMCIA,  
CardBus, S-video, USB  
and TV out ports**



## The WinBook XL<sup>2</sup> is an all-in-one notebook

and includes every feature you'll need today and for tomorrow's technology. We've "future-proofed" your purchase by including a 2x DVD-ROM drive, an AGP graphics port, ATI Rage LT Pro 3-D graphics acceleration and a USB port, so you can take full advantage of emerging software and hardware.

It's hard to believe that a notebook that's only 1 1/2" thin and weighs just 7 lbs. can hold all of these premium features. As soon as you see the dazzling 14.1" active matrix display, you'll know that this is our top-of-the-line notebook.

For today's demanding applications, push your efficiency to the max with the speedy Intel® Mobile Pentium® II Processor at 300 MHz, 128 MB of fast SDRAM, and the huge 6 GB Ultra DMA hard drive. Take control on the road with the internal 56k capable\* modem and back-up or transfer data with the LS-120 SuperDisk™ Drive that reads and writes both 120 MB SuperDisk™ Diskettes and floppy diskettes on the same drive.

Order your XL<sup>2</sup> today from the company that has won over 160 awards of excellence—WinBook. Visit [www.winbook.com](http://www.winbook.com) or call 888-621-3433.

### Intel® Pentium® II Processor 300 MHz

- 14.1" XGA Active Matrix Color Display
- 128 MB SDRAM
- 6 GB Ultra DMA removable Hard Drive
- 56k Capable\* v.90 Internal Fax/Modem
- ATI Rage LT Pro 3-D Graphics Accelerator
- 45 Watt/hour lithium ion Smart Battery
- 512k Pipeline Burst L2 cache
- LS-120 SuperDisk™ Drive (Reads floppy disks) and DVD-ROM Drive (Reads CD-ROM), both built-in, no need to swap
- Integrated dual-button Touchpad and Pointing Stick, both active simultaneously
- 3-D PCI Stereo Audio
- Two Type II PCMCIA slot, CardBus and ZoomedVideo supported
- Parallel, Serial, PS/2, VGA, 2-way Infrared port, TV out, USB
- One-year limited extendable warranty
- Microsoft Windows® 98 pre-installed

Business Lease: \$116/Mo. – 36 mos.†

**\$3199** 300 MHz

"Rarely have I seen a package so appealing on so many levels—performance, features, manageability, value and travel weight." —Windows Magazine 12/98

Order Online at:

**www.winbook.com**

**888-621-3433**

**WinBook®**

*Critically Proven.*

Circle 254 on card or go to [pcworld.com/infonet](http://pcworld.com/infonet)

\*Modems are capable of 56Kbps downloads. Due to FCC rules the tested power output, however, current download speeds are limited to 33.6Kbps. Actual speeds may vary depending on line conditions. †Monthly payments do not include shipping or any applicable taxes. ‡Monthly lease prices are based on a 36 month, no money down agreement. Monthly payments do not include shipping, fees, or any applicable taxes. Other business lease options available. Lease terms subject to change without notice. \*\*Resolution of 16.7 million colors.

© 1999 WinBook Corporation. All rights reserved. WinBook is a registered trademark of Intel Electronics, Inc. The Intel Inside logo and Pentium are registered trademarks and iBM is a trademark of IBM Corporation. All other trademarks and registered trademarks are property of their respective corporations.





**PART OF A SOLUTION IS REALLY NO SOLUTION AT ALL.**



**Networking/  
Data Storage**

**Software**

**Printers/  
Monitors**

**PCs**



**WE AGREE. TOTALLY.**

These days a lot of companies hope you'll settle for just part of a solution. That's why at CDW, we have all the leading brands in every computing category. So you get a total solution. And your CDW account manager, your Direct Solutions Provider, is an expert who'll personally build your computing solution with top-names, like Compaq, IBM, Toshiba, Hewlett-Packard, Cisco and Microsoft. And he'll



ship your custom-configured solution the same day, too. No wonder we're the number one source for the top-name brands. So just call 800-767-4239 or visit us at [www.cdw.com](http://www.cdw.com). Whatever you're looking for, it's the one-stop resource you need. And since we're a billion dollar, Fortune 1000 company, we've got the clout to get you the price you're looking for too. CDW, solutions that make your job easier. Totally.

**Computing Solutions Built for Business™**

**800-767-4239 [www.cdw.com](http://www.cdw.com)**

© 1999 CDW Computer Centers, Inc.

Circle 41 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# What's the fun of sampling just one





# When you can score all of them?

**T**ODAY IS YOUR LUCKY DAY. WE'RE PUTTING EVERYTHING YOUR PC NEEDS TO SECURE, PROTECT AND OPTIMIZE FOR THE NEW MILLENNIUM IN ONE BOX—MCAFEE OFFICE. HERE'S THE BEST PART: IT'S VALUED AT OVER \$399, EXCEPT YOU ONLY HAVE TO PAY AROUND **\$99\***

MCAFEE OFFICE INCLUDES VIRUSSCAN 4.0, THE #1 VIRUS DETECTION AND REMOVAL SOFTWARE, AND FIRST AID, WHICH AUTOMATICALLY CORRECTS THOUSANDS OF PROBLEMS AND PREVENTS SYSTEM CRASHES. YOU ALSO GET NUTS & BOLTS '98, WHICH INCLUDES EVERYTHING YOU NEED TO CLEAN, OPTIMIZE, MONITOR AND ANALYZE YOUR SYSTEM AND SOFTWARE. AND THE



YEAR 2000 CHECKER WILL GET THE BUGS OUT, SO YOU CAN RING IN THE TURN OF THE CENTURY WITHOUT A CARE IN THE WORLD.

BASICALLY, IF IT'S NOT IN MCAFEE OFFICE, YOUR PC DOESN'T NEED IT. FOR MORE INFORMATION, VISIT US AT [WWW.MCAFEE.COM](http://WWW.MCAFEE.COM) OR CALL 800-332-9966, DEPT. 1145.





# Your PC in the New



**Tomorrow's machines will be smarter, smaller,  
better-connected, and better-looking, too.**



# Millennium



PHOTOGRAPHS BY KEVIN CANDLAND • PHOTO ILLUSTRATIONS BY JEFF BERLIN

**IT'S NOT YOUR IMAGINATION:** Things really *are* changing faster than ever. Take hardware, for example. The average new PC seems to have a shorter life span than a tsetse fly's. Office storage rooms are filled with great technological advances that never made it past version 1.0. As the unlucky souls who purchased them no doubt discovered, the road to PC hell is paved with good inventions.

But to paraphrase a certain software mogul, what about The Road Ahead? Can you avoid buying hardware that becomes obsolete before you've finished paying for it? Yes, you can—if you shop wisely. That's why we've produced this guide to the technologies and trends that will shape the design of PCs for the next three years.

BY MICHAEL DESMOND

Though predicting the future is a job best left to the Psychic Friends Network, it's safe to say you'll see smarter silicon packed into more stylish cases. More than two dozen new CPUs will appear in the next 18 months, along with fast new memory types and

data connections. PCs will look better (thanks to slim, affordable LCD screens) and listen better (using software that recognizes speech, gestures, and even eye position).

In fact, by 2001 you may not recognize PCs at all. Many will fit into the palm of your hand; nearly all will offer connections to the Internet and to each other. But the road ahead is also full of speed bumps, potholes, and blind curves. The following pages will help you navigate the hairpin turns of technology and show you what's on the horizon, as well as what's just around the bend. ►



# More than Intel inside

## CHIPS TAKE ON 3D, BUSES HIT 133, FAREWELL AGP?

By 2000, Intel's mainstream desktop CPUs will tick along at a torrid 700 MHz. But that's not the only change you'll find inside the box. The coming three years will see numerous new

processor families (see "CPU Road Map," below), a new memory standard, and perhaps an end to the motherboard as we know it. The enhancements will allow new PCs to handle the emerging tasks of the day—intense 3D graphics, full-motion MPEG-2 video, and applications like voice recognition.

The question is, will there be enough of these applications to justify the additional cost? "The amount of processing power that will be in place in systems at that point will be absolutely scary," says Nathan Brookwood, president of Insight64, a technology consultancy in Saratoga, California. "And if software developers

don't find a way to soak up all that power, it's going to be a really messy market. The performance available in low-end systems will be far in excess of what most people need for their jobs."

Brookwood adds that it could be years before apps that really tax the coming generation of hardware appear. "I expect that in 2002 we'll see the arrival of reasonable amounts of bandwidth making that last mile to the home and business. And in my mind, that will trigger a reevaluation of what people can do with PCs."

### SWIFT SILICON

BROOKWOOD'S concerns haven't slowed Intel's rapid-fire introduction of new processors, nor will it keep the chip giant from making big changes to the PC platform. Later this year we'll see a new type of system memory called Direct Rambus DRAM (RDRAM) start to replace synchronous DRAM (SDRAM). Direct RDRAM memory uses a thin and fast connection to more than double the amount of data available to a PC's processor. MPEG-2 video, Accelerated Graphics Port-enhanced 3D graphics, and high-end imaging applications will all benefit from the faster RAM.

Alas, the performance boost will come at a cost. Brookwood expects both RDRAM chips and compatible motherboards to cost

## CPU ROAD MAP WHERE THE CHIPS WILL FALL IN '99 AND BEYOND

**Y**OU think the processor market is crowded now? Just wait. The next 18 months will see more than two dozen new CPUs from industry giants AMD, Cyrix, and Intel, as well as upstarts like Centaur and Rise Technology. These chipmakers will push speeds to a dizzying 700 MHz and beyond. Besides a blizzard of code names and buzzwords, consumers in 1999 will face a real choice: Pay more for performance or opt for cheaper chips that can still handle anything bread-and-butter business apps can throw at them. More buyers may choose the latter.

First out of the gate: 450- and 500-MHz Pentium II chips with Intel's Katmai instruction set, a successor to MMX that incorporates 70 new instructions to accelerate tasks such as 3D graphics and audio processing, speech recognition, and real-time MPEG-2

encoding and decoding. However, as with MMX, software must be optimized to take advantage of this technology. Don't expect such applications to appear overnight.

### AMD FIGHTS BACK

AROUND THE SAME TIME, AMD will unveil its 400-MHz Sharptooth chip. Sharptooth may outperform Pentium II chips at equal clock speeds on productivity apps, thanks to an on-board 256KB secondary cache that runs at the CPU's full core speed. (The Pentium II's off-chip secondary cache runs at half the processor's core speed.)

Sharptooth and future AMD chips will also include the 3Dnow instruction set, similar to but not quite as ambitious as Intel's Katmai. 3Dnow is designed to speed up graphics in optimized applications such as games. In the second quarter of this year, AMD will ship its K7 chip, debuting at a speed of 500 MHz or more and supporting

a blazing 200-MHz system bus.

Meanwhile, Intel will bump Pentium II Katmai chips up to 533 MHz and introduce the 820 chip set, which will support a 133-MHz system bus. The following quarter, the chip giant will release a new line of Pentium IIs made with a smaller, 18-micron manufacturing process. These so-called Coppermine chips will run at 600 MHz or faster, and come with an on-board 256KB secondary cache that runs at full speed. Supporting chip sets will allow a 133-MHz system bus and memory.

### FAST AND CHEAP

BUT IT'S NOT all about power. Expect plenty of action at the low end of the PC spectrum, as AMD, Cyrix, Centaur, and Rise Technology all try to undercut Intel's Celeron chip prices with low-cost processors of their own. The result? Surprisingly powerful desktops for \$699 to \$999.

Budget notebooks will also dip under \$1000 this year. Intel will release Celeron chips for laptops whose speeds start at 266 MHz; AMD and Cyrix will also ship low-cost notebook chips. But the major notebook news will be Intel's Geyserville technology, which will allow the processor to run at full speed when the machine is plugged in, and at a reduced speed on battery power. Look for Geyserville-driven notebooks to arrive in the third quarter.

As shown in the following pages, real competition—for price and speed—is brewing. If nothing else, the race among vendors to give you the most PC power for the money should be fun to watch. Expect glamorous speedsters to come and go, with no one processor lingering in the limelight. Consider this information carefully, whether you're shopping for a \$699 bargain or a \$2000 barn burner. —Laurianne McLaughlin

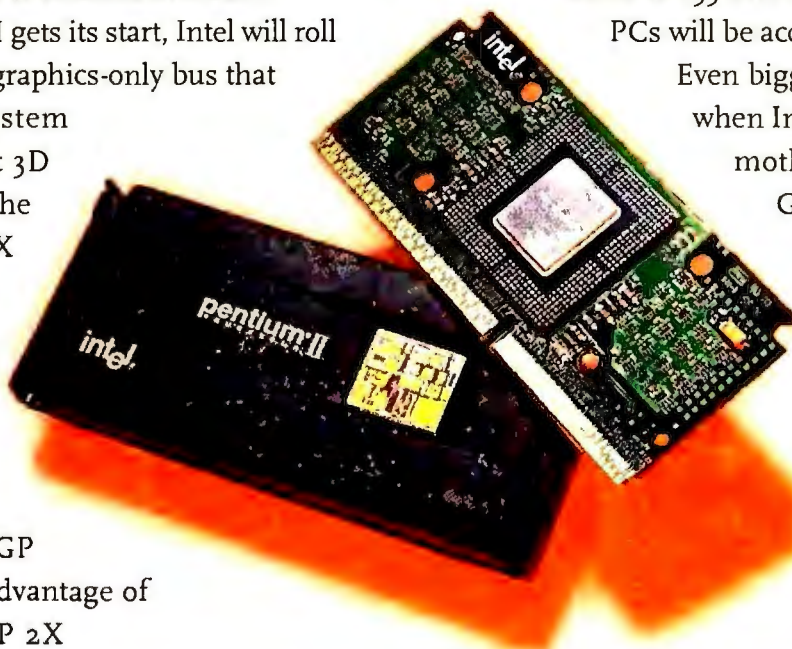


more than today's SDRAM technology, at least through 2000. As a result, he says, universal adoption of Direct RDRAM won't happen until 2001. Nonetheless, the technology has the support of key CPU players like Advanced Micro Devices and Compaq's Alpha division, making it a lock to succeed SDRAM.

Around the time that RDRAM gets its start, Intel will roll out a new version of AGP, the graphics-only bus that lets graphics cards call on system RAM to create highly realistic 3D images. AGP 4X will double the data rate of today's AGP 2X cards. The extra speed may help eliminate some delays that occur when AGP-enhanced games juggle detailed 3D scenes. Keep in mind that your mileage may vary.

Even though you'll need an AGP 4X graphics card to take full advantage of the new bus, most older AGP 2X cards should work just fine in the new slots, according to Niles Burbank, product manager for ATI Technologies, a graphics hardware maker based in Thornhill, Ontario.

By late this year, many lower-end machines will not have a separate graphics chip at all, as more tasks begin to fall directly to the chips attached to the processor. Intel's Celeron-based motherboards will begin using the company's forthcoming 810 chip set, which will include a built-in graphics controller. Likewise, Cyrix's MXi processor, which is expected to arrive this spring, will integrate a 3D graphics controller.



**HIGH AND LOW:** Can Intel's Pentium II and Celeron CPUs capture both ends of the PC market?

## MOTHERBOARD MAKEOVER

THIS YEAR, for the second time in two years, Intel processors will boost the bus speed of high-end PCs. Newer chip sets like the one code-named Camino will rev the system bus from 100 MHz to 133 MHz for Pentium II lines, while Celeron PCs will be accelerated from 66 MHz to 100 MHz.

Even bigger changes are due in 2000 or 2001, when Intel is expected to shake up the current motherboard format, according to Peter Glaskowsky, senior analyst for MicroDesign Resources, a technology analysis firm in Sebastopol, California. The change will open the throttles on system bus speeds, further enhancing programs such as real-time natural speech recognition, advanced 3D modeling, and software-based MPEG-2 video playback. (Currently, you need an MPEG add-in card, but the speedier motherboards will handle video without the aid of extra decoder cards.)

Intel won't talk about its plans, but Glaskowsky envisions a motherboard that links components using thin and fast, point-to-point connections. Data will travel directly from system memory to the CPU, bypassing the chip set. The shorter wires and simpler data transfers will allow motherboard speeds of 200 MHz and beyond, says Glaskowsky.

The new type of motherboard will sport a high-end expansion bus that should run nearly ten times faster than today's PCI bus, Glaskowsky adds. This bus will likely supersede AGP and become the main conduit for graphics and even disk access. ►

## FIRST QUARTER 1999

### Intel Celeron-366 and -400

Speed: 366 and 400 MHz

For: Budget desktops

What's hot: Near-Pentium-400 performance in \$1499 PCs

What's not: Lacks new Katmai multimedia instructions

### Intel Celeron for notebooks

Speed: 266 and 300 MHz

For: Subnotebooks and budget notebooks

What's hot: Low cost; you'll see more \$1599-range notebooks soon

What's not: Can't judge battery life yet

### Intel Pentium II Katmai

Speed: 450 and 500 MHz

For: Power desktops

What's hot: 70 new CPU instructions for speeding up graphics and audio processing

What's not: Apps must be optimized to take advantage of new instructions

### Intel PII-333 and -366 for notebooks

Speed: 333 and 366 MHz

For: Power notebooks

What's hot: On-board secondary cache, could outperform comparable Pentium II desktops

What's not: Could be pricey

### AMD Sharptooth

Speed: Likely 400 MHz, perhaps 450 MHz

For: Power desktops first, notebooks later

What's hot: On-board 256KB secondary cache, may surpass comparable Pentium IIs on business apps

What's not: Too early to judge multimedia performance

### Cyrix M II-350 and -366

Speed: 350- and 366-MHz PR ratings

For: Budget desktops

What's hot: System prices may be as low as \$899 with monitor

What's not: Don't look for great speed on graphics apps like 3D games

### Rise Technology MP6

Speed: 233- and 266-MHz PR ratings

For: Budget desktops first, budget notebooks later

What's hot: Claims edge with MMX instructions and soft DVD playback; targeted at \$799 to \$999 home PCs

What's not: No on-board secondary cache; vendor is a small fish in a sea of CPUs

Note: All dates and chip speeds are approximate, based on projections supplied by vendors and analysts. PR ratings describe the rough performance level of the chips' respective Intel competitors.



# The shape of things to come

## SHOEBOX PCs, SCREENS GO FLAT, PORTS GET FAT.

Your next PC will be speedier, more powerful, and better connected. Despite these improvements, you can expect these PCs to be smaller and less expensive than the one you now own.

The most obvious changes will be cosmetic. The iMac proves that PCs don't need to be boring and beige—but then again, not every Dell or Compaq box will be a translucent art piece either. Changes inside the case will give many systems a more svelte figure, says Carl Everett, senior vice president of the personal systems group at Dell Computer in Round Rock, Texas.

Everett says that by 2000, the archaic ISA expansion bus will be a not-so-fond memory. Freed of bulky ISA slots, vendors will be able to choose from smaller motherboards and experiment with stylish, space-saving PC designs. Miniaturization and market pressure will push the trend, says Martin Reynolds, vice president of technology assessment at Dataquest, a technology research firm in San Jose, California. He expects that by 2002, many desktop PCs will be as small as a shoebox.

### GOOD-BYE CRTs: FLAT'S WHERE IT'S AT

THE PC'S SLIMFAST diet will really kick in with the next generation of displays, according to Everett. Today's bulky 17- and 19-inch CRTs can weigh 50 pounds and consume more than a square foot of desk space. LCD screens offer nearly all the dis-

play area of today's large CRTs, yet weigh one-fifth as much, take up a third of the space, and use half the electricity. They also display sharper graphics and induce less eyestrain than their CRT counterparts.

Today, a decent 15-inch LCD costs as little as \$900—cheap enough to make it an attractive buy for many desktop users. Unfortunately, a surge in flat-panel display sales will outstrip manufacturing capacity in 1999, says Ross Young, president of the research firm DisplaySearch in Austin, Texas. The result is that prices for 15-inch LCDs will drop only slightly—probably to around \$825—by the end of the year. Around that time, panel makers will begin to introduce 18-inch

models, which will carry premium prices in the \$2000 range.

Another problem: The best LCD monitors connect digitally to your PC's graphics card to deliver crisp images. But you may have to wait before all graphics card vendors and LCD makers agree on a standard link. That means your next PC may need to use a proprietary connection to the graphics card.

"What you will see for the next year or so is the graphics cards and the flat-panel monitor will be sold together," says Micro-Design's Glaskowsky. A standard interface should emerge by the end of the year, says DisplaySearch's Young, making buying an LCD as easy as purchasing a CRT monitor today.

The future of displays looks brighter still: IBM Research Labs has demonstrated a flat-panel monitor that produces visual fidelity on par with printed paper. Phil Hester, vice president and chief technology officer for IBM's Personal Systems Group in Somers, New York, says the new technology will enable electronic display of high-resolution images for applications such as medical radiology and aircraft maintenance. "In two to three years, [the price for such a monitor] will drop to the point where you will consider it, but it will still be a premium display," he says.

## SECOND QUARTER 1999

### Cyrix MXi

Speed: 333- to 350-MHz PR ratings

For: Budget desktops, notebooks

What's hot: Modified M II; first Cyrix chip to implement AMD's 3DNow instruction set; should handle games well

What's not: Too early to judge

### Cyrix M II-400

Speed: 400-MHz PR rating

For: Budget desktops

What's hot: Low system prices, reasonable business application speed

What's not: Graphics speed is still an unknown

### Intel PII-533 Katmai

Speed: 533 MHz or faster

For: Power desktops

What's hot: New 820 chip set supports 133-MHz system bus and memory

What's not: AMD's K7 processor may be faster on some business apps

### AMD K7

Speed: 500 MHz or more

For: Power desktops, workstations, servers

What's hot: Seventh-generation chip core, improved floating point capabilities, support for a 200-MHz system bus

What's not: Too early to tell

### Rise Technology MP6 II

Speed: Likely 333- or 366-MHz PR rating

For: Budget desktops first, budget notebooks later

What's hot: On-board 256KB secondary cache should speed up CPU significantly over original MP6

What's not: Unclear how well newcomer will fare against AMD, Cyrix, and Intel

### Centaur WinChip 2A

Speed: 233, 250, and 266 MHz

For: Budget desktops

What's hot: Superlow prices, 100-MHz system bus

What's not: Has 64KB primary cache, but no secondary cache; effect on performance is unknown



## PARING DOWN PORTS

YOUR NEXT PC will drop ports as well as pounds—and the ports that remain will run faster and act smarter than the ones they replace. Expect all new computers to ship with USB-compliant mice, keyboards, and other peripherals. Native support in Windows 2000 (aka NT 5) will also bring USB's benefits to many corporate and high-end PC users.

USB will have some company in the form of the IEEE 1394 bus, better known as FireWire. This ultrafast serial bus runs up to 100 times faster than USB, yet allows you to link multiple peripherals in a convenient, plug-and-play daisy chain. You will use FireWire for digital video capture, broadcast-quality digital video output, and high-speed disk drives.

In fact, the IEEE 1394 bus exists today: Both Sony and Compaq now ship consumer-oriented desktop computers with ports that support the bus. Sony has even added its own version of FireWire, called i.Link, to its newest VAIO PCG-505FX notebooks. However, Intel won't include support for the bus in its chip sets until mid-1999, says MicroDesign's Glaskowsky, and the cost of custom chips and connectors will make IEEE 1394 a bit player until about 2001. At that point, the new specification will replace both SCSI and IDE as the bus of choice for mass storage devices like hard disks and CD-ROM drives.

In the meantime, expect your next desktop PC to sport an updated IDE interface for internal drives. The ATA-66 interface—introduced by Quantum Technology to buy time until FireWire catches on—doubles the peak performance of current ATA-33 peripherals. But don't rush out just yet to get a new ATA-

**MOVE OVER, iMAC:** With its Concept PC prototype, Intel hopes to prove that PCs can be hip, too.



66-friendly PC and compatible drives; today's ATA-33 storage devices provide enough performance for all but the most demanding applications.

USB and FireWire also set the stage for a standard called Device Bay, a modular, tool-free housing for plug-and-play peripherals. Need to work on that big 500MB presentation over the weekend? Just slide out your office PC's hard disk, as you would a removable car radio, and pop it into your home machine.

"I think that three years out we'll start to see a fairly significant penetration of Device Bay with IEEE 1394," says Dataquest's

Reynolds. "When we get down to just a couple of fast

serial interfaces, we can get by with something like Device Bay." In fact, Reynolds

envisioning a day when system makers

will turn to Device

Bay technology

as a way to

cut the considerable costs

of motherboard

manufacturing.

"The processor it-

self could become a Device

Bay module," says Reynolds. "I

think consumers will take to it

because it will be low priced and quite

elegant. You'll be able to do many of the

upgrades through the bays."

Just think of it: Someday our PC components

will be simple, slide-in modules. No ribbon cables, no tiny screws. We may never have to take the cover off a PC again.

## INSTINCTIVE INPUT

CRITICAL ADVANCES in computer recognition of speech, facial characteristics, and gestures will add new dimensions to PC interfaces. Monitor-top cameras and superfast hardware will enable the "multimodal interface," says Robert Morris, direc- ►

## THIRD QUARTER 1999

### Intel Pentium II Coppermine

Speed: 600 MHz or faster

For: Power desktops and notebooks

What's hot: New manufacturing process allows higher clock speeds and on-board 256KB secondary cache, a first for Pentium II desktop chips.

Geyserville technology lets notebooks run at 600 MHz when plugged in or at 400 MHz on battery

What's not: You'll probably pay premium prices

### Cyrix Media PC integrated chip

Speed: 233 to 300 MHz

For: Sub-\$500 information appliances

What's hot: Could enable new class of low-cost devices for the home

What's not: Chip may ship late

### Centaur WinChip 3

Speed: 200, 233, and 266 MHz

For: Budget notebooks

What's hot: Low-power chip with an unusual 128KB primary cache and a 100-MHz system bus

What's not: No on-board secondary cache; too early to judge potential on-board performance

### Cyrix Jedi

Speed: 400- to 450-MHz PR ratings

For: Budget desktops

What's hot: Improved floating point and MMX support compared to other M II chips; has AMD's 3DNow instruction set; cheaper than Celeron-based PCs

What's not: Too early to judge performance



tor of personal systems and advanced systems technology for IBM Research in Yorktown Heights, New York. "We are trying to bring the keyboard, the pen, the camera, and speech all together," he says. "There will be interfaces that observe you and track your eye position. One thing we're experimenting with at the moment is how to use cameras in children's educational games." Future multimedia titles will be able to detect whether children are paying attention to the game and then respond appropriately.

Users with disabilities will also benefit from interfaces that can recognize gestures. Smart software will allow PCs to separate normal human movement from command-specific gestures, says Morris.

Similarly, input devices will become more intelligent and more interactive. "We're definitely exploring what a mouse can do," states Dan Coyne, group marketing manager for Microsoft's Hardware Group. Coyne describes a mouse in development that lets users feel icons and links as the device is dragged over them.

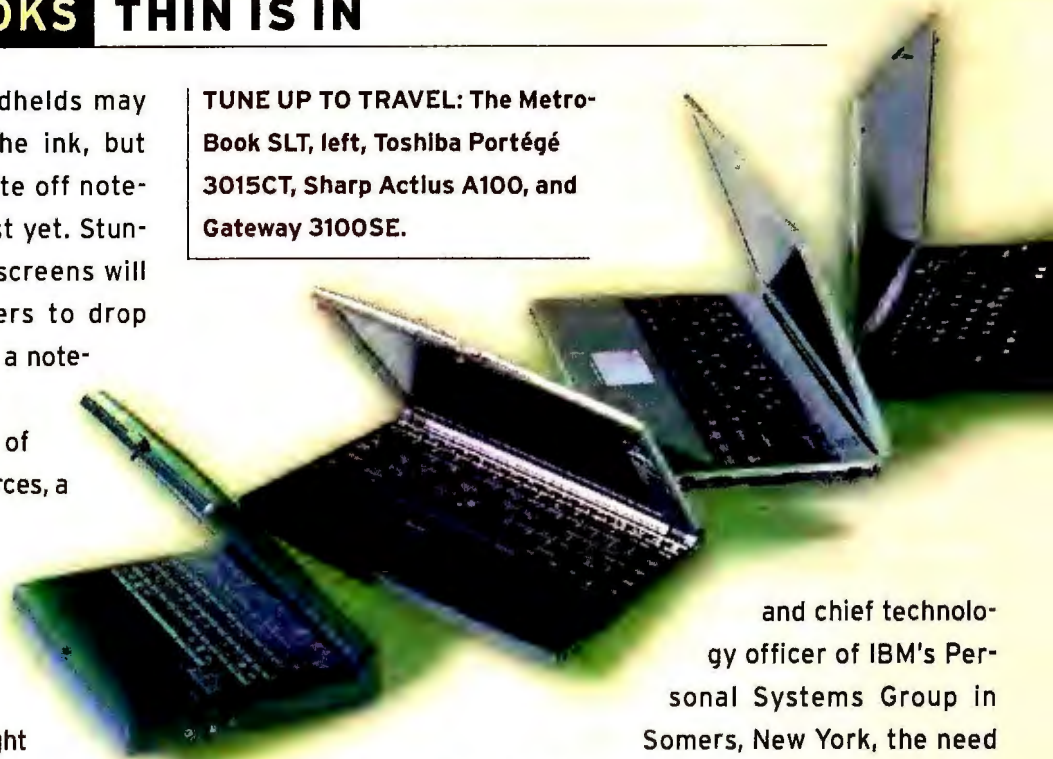
As usual, gamers will get first crack at most of these new technologies. Microsoft's new Freestyle Pro game pad introduces motion detection to the mix. "When the game pad is tipped, it actually detects the movement," says Coyne. "So when you tip your controller to the right, the motorcycle actually turns to the right. As you instinctively move, it moves too."

## NOTEBOOKS THIN IS IN

**S**EXY handhelds may get all the ink, but don't write off notebooks just yet. Stunning 15-inch LCD screens will entice many buyers to drop \$4000 or more on a notebook computer. But Peter Glaskowsky of MicroDesign Resources, a technology analysis firm based in Sebastopol, California, says such large-screen notes push the weight limit for most users. "[A 15-inch LCD] is physically too big for notebooks," he says. "The screens have to stay around 13 or 14 inches to give the notebook a manageable size and weight."

The 15-inch screen will find a home on desktop replacements—feature-laden notebooks that spend most of their time in the

**TUNE UP TO TRAVEL:** The Metro-Book SLT, left, Toshiba Portégé 3015CT, Sharp Actius A100, and Gateway 3100SE.



office. For life on the road, buyers may opt for slick 3- and 4-pound portables such as Sony's magnesium-alloy coated VAIO PCG-505FX or Sharp's sleek, black, and brushed silver Actius. By year's end, 400-MHz Pentium II CPUs for portables with Katmai instructions will debut, while DVD-ROM and 100-MB floppy drives will become standard equipment.

But even though "thin is in," says Phil Hester, vice president

and chief technology officer of IBM's Personal Systems Group in Somers, New York, the need for touch-typeable keyboards limits how much notes can shrink.

And don't expect big changes in battery life, warns Glaskowsky. Small gains will come from smart operating systems that turn off PC subsystems when idle.

Finally, Intel's Geyserville technology should enable processors to run at higher clock rates when notebooks are plugged in, allowing them to reach speeds that were once the sole province of desktop systems.

### WHAT'S IN STORAGE?

ABOUT TEN YEARS AGO, you could buy a PC with a 100MB hard disk and a 1.44MB floppy drive. These days you can buy a computer with a 16GB hard disk and—you guessed it—a 1.44MB floppy drive. How has the floppy survived?

## FOURTH QUARTER 1999

### Intel Celeron-450

Speed: 450 MHz

For: Budget desktops

What's hot: Loaded systems at low prices

What's not: Too early to tell

### Centaur WinChip 4

Speed: 400 to 450 MHz

For: Budget desktops and notebooks

What's hot: New chip core uses a 128KB

primary cache and 100-MHz system bus

What's not: Too early to tell

### Cyrix Jedi-500

Speed: 500-MHz PR Rating

For: Budget desktops

What's hot: May offer better graphics support for games than Intel's Celeron at this time

What's not: Probably won't outperform 450-MHz Celerons by much on business applications

### Intel PII-650 or PII-700 Coppermine

Speed: 650 or 700 MHz

For: Power desktops

What's hot: Too early to tell

What's not: Existing software doesn't need this much speed

### Cyrix MXi-400

Speed: 400-MHz PR Rating

For: Budget desktops, notebooks

What's hot: Integrated 3D graphics; likely choice for extremely low-cost home PCs

What's not: Too early to judge





# Committed To the Details.

## THE PROFESSIONAL SERIES

PR500 (15"/14" VIS)

PR700 (17"/16" VIS)

PR710 (17"/16" VIS)

PR711 (17"/16" VIS)

## THE FEATURES

- 0.25mm aperture grille
  - Vertically flat screen
  - MPR-II/TCO\* certification
  - OSD & digital adjustment
  - BNC connectors\*
  - 160Hz vertical refresh rate\*
  - 1600X1200 max. resolution\*
- \*on select models

## THE BOTTOM LINE

Ultra-sharp display  
with Trinitron® CRT  
technology

CTX International, Inc.  
Manufacturers of quality CRT  
monitors, LCD displays, note-  
books and desktop systems.

800-888-9052  
[www.ctxintl.com](http://www.ctxintl.com)

Circle 77 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# CTX

COMMITTED TO XCELLENCE



It's not for lack of alternatives. The Iomega Zip, LS-120 SuperDisk, and Syquest EZ Flyer drives have all tried and failed to replace the unsinkable floppy. Now Sony is pushing a 200MB floppy called HiFD, which is readable by new external and internal drives. "It's chaos," says Hester of IBM's Personal Systems Group. "The problem is that there are a whole bunch of very good disk storage technologies, many of which have reasonable market share. I think it's going to be something of a potpourri for quite a while."

According to Dataquest's Reynolds, CD-Rewritable is the most likely universal format, at least for the short term. CD-RW drives now sell for less than \$350 and will continue to drop in price, and nearly all PCs sold in the past two years can read CD-RW media. "My view is that eventually we'll see a DVD-ROM drive that's capable of recording CDs," says Reynolds.

One thing we definitely won't have to worry about is a storage

**FLAT-OUT GORGEOUS:**  
Silicon Graphics' 17-inch LCD looks great, but it requires a custom graphics card.



crunch. IBM's Hester says the data capacity of magnetic hard disks will continue to grow at its current torrid pace. By 2000 we'll see 50GB hard drives; by 2001 that number should increase to 75GB or 100GB.

## Making the **right** connections

### CABLE HOOKS UP, WEB APPS LOG ON, NET PHONES DIAL IN.

Yes, more and more users will retire their creaky analog modems in favor of fast cable modems and DSL (Digital Subscriber Line) devices. But the truth is, high-speed Net access will remain unavailable to most homes.

Even so, we'll all be doing more work online—from real-time banking and collaborative office apps to Web-based personal information managers and schedulers. And Internet phone service may finally become something to talk about.

For most users, the biggest issue is how they will connect to the Internet in 2000 and beyond. Unfortunately, most homes and small businesses will rely on the same old phone lines and modems they use today. According to a study by Jupiter Communications, a New York-based Internet market research firm, only one home in five will have high-speed Net access by 2002. If you're among that lucky few, odds are you'll be using a cable modem. Over 60 percent of homes in the United States currently subscribe to cable TV service, and Internet access via cable can be had in a growing number of metropolitan areas for as little as \$40 per month. But many providers haven't yet upgraded their coaxial cable lines for two-way data communications or added new equipment to serve individual neighborhoods. ►

### 2000 AND BEYOND

#### Intel Celeron-500

Speed: 500 MHz, possibly 600 MHz  
For: Budget desktops  
What's hot: Likely to include Katmai instructions  
What's not: Too early to tell

#### Intel PII-700

Speed: 700 MHz or faster  
For: Power desktops  
What's hot: Too early to tell  
What's not: Few apps may require this much speed

#### Intel Willamette

Speed: 1 GHz or faster  
For: Power desktops  
What's hot: Completely new, seventh-generation chip core replaces Pentium II and Celeron chips  
What's not: Intel's schedule could slip into 2001

#### Intel Merced

Speed: Up to 800 MHz  
For: Multiple-processor systems  
What's hot: First chip to use 64-bit architecture; aimed at servers and workstations  
What's not: Applications need to be recompiled for 64-bit computing

#### Cyrix Jalapeno (M3)

Speed: 600 to 800 MHz  
For: Budget desktops and notebooks  
What's hot: New chip core replaces the M II; will use integrated 3D graphics unit  
What's not: Too early to tell

#### Centaur WinChip 2000

Speed: 500 MHz or faster  
For: Budget desktops and notebooks  
What's hot: If Centaur delivers chip on time, it can stay in the game competitively  
What's not: Too early to tell



Different people.  
Different solutions.

# PCs with attitude!

**Because your PC should be as unique as you are**

"PCs with attitude!" isn't some whimsical notion conjured up in our Marketing Department. It's the combination of nine years of PC experience and customer feedback. And it's built into every one of our award-winning systems. After all, making CyberMax the right company for you means listening to the people who keep us in business—You!

Jolt every one of your senses throughout the New Year with the

**\* Enthusiast Rebel 2/3D** power system— your 2D world will never be the same. Jump into the third dimension and feel like you're in the middle of all the action with spectacular graphics on a **21" monitor**, driven by a **400MHz AMD K6®-2** with **3DNow!™ technology** and an **nVIDIA RIVA TNT 3D** graphics accelerator. Get blown away with screaming 3D sound by **Altec Lansing's ADA305** side-firing speakers with multichannel surround sound and the **Aureal A3D PCI** sound card. We know that PC Enthusiasts demand the latest and the greatest. That's just one of the reasons why CyberMax was chosen as the official PC manufacturer of the **Professional Gamers' League**.

We think you'll agree... CyberMax— We fit your 3D life.

\*With 3DNow!™ technology, the AMD-K6®-2 processor enables a 3D visual experience vastly superior to the Pentium®II. Based on the latest 3D Winbench™ 98 scores, the new AMD-K6®-2/350 is even faster than the Pentium®II-400.

VIEW OUR COMPLETE LINE  
OF HOME & BUSINESS SYSTEMS @

**www.cybermaxpc.com**  
order online 24/7

## The Enthusiast Rebel 2 K6®-2/400MHz

- ❖ AMD-K6®-2/400MHz w/3DNow!™ Tech.
- ❖ 128MB SDRAM
- ❖ 10.2GB Ultra ATA Hard Drive  
*Upgrade to 13GB Hard Drive...\$49*
- ❖ nVIDIA RIVA TNT 16MB  
3D AGP Graphics Accelerator  
*Add 3Dfx Voodoo2 3D Accelerator  
w/12MB...\$149*
- ❖ CyberMax 21" (26dp-20" VA) Color Monitor
- ❖ DVD-ROM III (32X CD-ROM)
- ❖ V.90 Standard 56K Voice/Fax  
Modem w/ Speakerphone
- ❖ Aureal A3D™ PCI Sound Card
- ❖ Altec Lansing ADA305 Digital  
Powercube Speakers w/ Subwoofer
- ❖ Corel WordPerfect Suite 8  
& Max's Enthusiast Pack
- ❖ 3 Year Limited Warranty

Order# D201 **\$1999**

business lease \$70

AMD-K6®-2/350MHz .....\$1899  
AMD-K6®-2/380MHz .....\$1949  
Pentium®II 400MHz .....\$2149



**CyberMax**  
Computer, Inc.  
We fit your life.

**www.cybermaxpc.com**

**1-800-437-4596**

Corporate Sales 1-800-419-4064 ♦ In Canada 1-800-695-4991 ♦ Int'l. 1-610-770-1808

**"...over 94 percent of CyberMax users say they would buy another CyberMax PC based on reliability and service."**

PC World Cover Story: Special Report on Reliability and Service— November 1998 —  
Good Rating, 4 Stars out of 5 for Overall Reliability and Service

**PC WORLD**

### PC World 1998 Reliability & Service Survey:

	Overall reliability score	Overall service score
<b>Good</b>		
CyberMax	★★★★	★★★★
Dell	★★★★	★★★★
IBM	★★★★	★★★★
<b>Fair</b>		
Gateway 2000	★★★	★★★
Compaq	★★★	★★★

PC World Best Buy  
Best Buy #2  
Top 20 Budget Desktops  
November 1998



PC World  
Best Buy #1  
Top 10 Home PCs  
November 1998



WINNER OF THE COMPUTER SHOPPER  
1998 DIRECT CHANNEL  
ACHIEVEMENT AWARD  
PC SYSTEMS



The Entrepreneur Series

The Enthusiast Series

CyberMax Computer, Inc. 133 N. 5th Street Allentown, Pa. 18102 ♦ (610) 770-1808 Fax 800-599-7576 ♦ Canada 1-800-695-4991 CyberMax is a registered trademark of CyberMax Computer, Inc. All other trademarks are the property of their respective owners. © 1998 CyberMax Computer, Inc. All rights reserved. Service is at the discretion of CyberMax and is available for hardware replacement only and may not be available in certain remote areas. A diagnostic determination must first be made by a CyberMax technician. CyberMax is not responsible for any damage to your system or data. CyberMax is not responsible for any damage to your system or data. CyberMax is not responsible for any damage to your system or data.



In contrast, the other heralded high-speed network option—DSL technology, championed by phone companies—is expected to languish in the home market. “The [regional] Bell operating companies are trying not to cannibalize their T1 services, which are incredibly lucrative,” says Zia Daniell, an analyst in the telco and cable Internet strategies group at Jupiter Communications. Businesses today pay as much as \$1000 a month to lease a T1 line. Low-cost DSL services promise to deliver nearly equivalent performance for as little as \$40 a month.

Users in rural areas will rely on satellite services such as DirecPC for speedy Internet downloads, though uploads still require a slow modem connection. The picture gets brighter in 2003, when Teledesic launches the last of some 288 low-earth-orbit satellites; the low orbit allows upstream data to be sent directly to the satellite, resulting in cablelike data rates.

**CABLE READY:**  
Com21's cable modem offers speedy Web surfing—provided your cable company supports it.



between the server and the client system are screen updates and keystrokes. Think of it as outsourcing IS: Small firms pay a low monthly fee to a provider, which manages the apps and servers. Meanwhile, Web-based services let individuals and groups post and share their schedules online. AT&T's PocketNet, for example, lets you upload data to the Web and then access it with a cellular phone. Pacifica Software's Web Calendar and Yahoo Calendar give you access to your Web-based schedules.

Applications will also become more Web savvy.

Take Microsoft's Office 2000 suite: It offers HTML as a native file format; after you save a Word 2000 document to the corporate intranet, you can open the HTML file directly in Word to make changes.

Even your phone will go online, as telephone companies begin to deliver reliable, low-cost voice-over-Internet Protocol services. Once derided for its poor audio quality and lack of coverage, IP telephony is improving and expanding. More importantly, you no longer need a PC to make IP calls—you can dial a toll-free number, punch in your personal identification number, and then dial. Jupiter's Daniell says that consumers and small businesses will be the first to take advantage of Net phone services' lower rates.

## INTERNET EVERYWHERE

THIS YEAR, LOOK for more Internet services to replace apps that traditionally reside on a local network or desktop. Companies like Telecomputing ASA in Norway are rolling out “rent an app” services, using Microsoft's Windows NT Terminal Server to dispense Windows programs to terminals worldwide. All that passes

## FUTURE TECHNOLOGY COMING SOON TO A PC NEAR YOU

DEVELOPMENT	The buzz	But on the other hand...
<b>First quarter 1999</b>		
\$900 15-inch LCD screens	Great-looking images.	No standard digital interface; cost more than 17-inch CRTs.
ATA-66 IDE hard drives	Double the speed of existing IDE drives.	Could be speed you don't need.
HiFD removable storage devices	Sony's fast, 200MB floppy replacement could be the real deal.	Just what we need—another floppy technology.
Katmai CPU instructions	3D graphics, audio, and speech recognition get a boost.	Show me the software.
Palm III meets the cell phone	A natural marriage of convenience.	Price will be hefty.
<b>Second quarter 1999</b>		
340MB MicroDrive hard disk	IBM's PC-Card-like disk for notes and PDAs may replace flash RAM.	Will we add hard disk crashes to our list of PDA worries?
Faster motherboards	Intel pushes motherboards to 133 MHz.	You'll need expensive RDRAM to use these.
First ISA-free machines	Fewer hardware hassles.	Kiss your old sound cards and modems good-bye.
<b>Third quarter 1999</b>		
810 chip set	Intel's built-in 2D and 3D graphics for low-cost systems.	Two words: no upgrades.
AGP 4X graphics	Doubled-up AGP bus readies hardware for future graphics.	For gamers only—if they can find the software.
Direct RDRAM memory	Terrific 3D graphics performance.	We're back to the days of pricey RAM.
600-MHz Pentium II	Integrated 256KB secondary cache means this chip will fly.	Can you afford the ticket?
<b>Fourth quarter 1999</b>		
Standard interface for LCDs	Plug and play, take it away.	Panel shortage will keep prices high.
Windows 2000 (aka Windows NT 5)	Fewer crashes, better security, corporate-minded features.	Promises, promises.
<b>First quarter 2000</b>		
First Bluetooth devices	Fast wireless link for PCs and devices.	Sure to be supported in, oh, Windows 2010?
ISA-equipped machines begin to disappear	Ding dong, the witch is dead.	And so are all your trusty ISA peripherals.



We can't say what applications she'll be using in five years.

We can, however, predict the monitor.



**MultiSync**

Software goes out of date. CPUs are superseded.

In the face of nearly chaotic change, it's reassuring to know you can count on MultiSync® E Series monitors for years to come. Take a look. Our CromaClear™ and dot trio CRTs deliver all the contrast, sharpness and color-saturation you need for demanding applications. But what isn't so apparent is the reliability and flexibility we build into each monitor. Refresh rates up to 120 Hz, PC and Macintosh compatibility and

	MultiSync E500™	MultiSync E750™	MultiSync E900+™	MultiSync E1100+™
Viewable Image Area	13.8"	16.0"	18.0"	19.8"
CRT	CromaClear	Short-depth CromaClear	Microfilter™ Dot Trio	Microfilter™ Dot Trio
Dot Pitch	0.25mm mask	0.25mm mask	0.26mm dot 0.22mm horizontal	0.28mm dot 0.24mm horizontal
Maximum Resolution	1280 x 1024 @ 65Hz	1600 x 1200 @ 73Hz	1600 x 1200 @ 77Hz	1600 x 1200 @ 77Hz

OUR NEW SHORT-DEPTH MULTISYNC E750 COMPLETES THE E SERIES FAMILY.

and the optional IntelliBase™ Series\* monitor bases mean they'll grow as your needs change. And for added security, they're backed by a three-year warranty. MultiSync E Series monitors. With longevity like this, you might just retire before your monitors do.

**NEC**

**IntelliBase**  
Intelligent USB and audio solutions

  
NEC Technologies

To learn more or for a reseller near you, call (800) NEC-INFO or visit us at [www.nectech.com](http://www.nectech.com). Expect more. Experience more.



# The incredible shrinking computer

## SUBNOTES EMERGE, CELL PHONES AND HANDHELDS CONVERGE.

PalmPilot users display a cultish affection for their little handheld devices. Expect similar love affairs to bloom over the next two years, as cell phones, beepers, and personal digital assistants merge to form powerful communications tools.

But don't count out Jupiter machines yet. These small portable devices, which use the Windows CE Professional operating system, weigh about 2 pounds, provide 9-inch color screens, and

offer keyboards that are large enough to type on. At prices less than \$1000, according to Dataquest's Reynolds, these machines plug a gap between tiny handhelds and full-featured notebook computers that cost twice as much.

Hewlett-Packard, NEC, Samsung, and Sharp all market Jupiter devices (as they are code named) to traveling executives tired of hauling around an 8-pound notebook just to check their e-mail messages. CE Pro machines offer

instant-on operation and quick data retrieval, making them suitable for a wide range of applications.

### HAND IN HAND

EXPECT TO SEE lighter, more powerful handheld devices equipped with sharper screens this year. For example, 3Com's next version of the Palm will reportedly offer a color screen in a case that is only one-third the thickness of its predecessors.

Cellular phones and personal digital assistants will also be getting cozy. Qualcomm's PdQ Smartphone, expected by the middle of the year, will combine a 3Com Palm III and a Qualcomm digital cellular phone. You'll be able to grab e-mail over the phone and dial directly from the Palm III address book.

The real breakthrough, however, may come in late 1999 to early 2000, when devices start using a wireless technology called Bluetooth. This industry standard will enable fast short-range communications between devices. Set your Bluetooth-capable palmtop device next to a similarly equipped PC, and they'll transfer e-mail and update contact lists at about 1

megabit per second. American Airlines and other airlines are talking about installing Bluetooth stations in airport lounges, so fliers can place their notebooks next to a transmitter and check their e-mail. Lee Green, director of corporate identity and design at IBM, envisions bigger changes: "At some point in the future, one version of a mobile device will be a wearable one." According to Green, everyone from surgeons

to archaeologists will be able to access critical information using such a PC. A tiny monitor mounted over one eye could display text and schematics, while navigation could be handled through voice recognition. Fairfax, Virginia-based Xybernaut is already marketing a wearable PC featuring a 233-MHz processor, 128MB of RAM, and a 4.3GB hard drive. You attach the 28-ounce processor unit to your belt; an optional keyboard can be strapped to your arm. The price? A fashionable \$5700.

Ultimately, new classes of portable devices will permeate our homes and workplaces, says Phylis Porio, IBM's director of marketing for pervasive computing. "[The lines between] people's business lives and personal lives are blurring more and more."

In areas such as entertainment, the lines may already be permanently blurred. Diamond's controversial RIO MP3 audio device plays back high-quality compressed music files that can be downloaded from the Internet. Recording companies, fearful that illicit downloads of commercially-available music will find a ready market in the MP3 platform, have tried to block the technology from getting to consumers. But digital content of all kinds will take similar paths to reach consumers in the coming years.

*Michael Desmond is a consultant and author of the Peter Norton Guide to Upgrading and Repairing PCs (Sams Publishing, 1997). Laurianne McLaughlin is a senior associate editor for PC World.* ■

**PILOT LOVERS** will flip for Qualcomm's combination cell phone and Palm III device.



**SMALL AND SMART**  
(clockwise from top): Sony's i.Link digital camera, Philips' USB-based video camera, Vadem's Clio CE machine, and Diamond's RIO MP3 player.





# Why choose Quantex?





# The experts do

---

**"When we replaced our Compaq systems in 1995 with Quantex systems for our executive departments, we not only got fast, powerful, nearly maintenance-free machines, but also dramatically reduced our total cost of ownership. On those rare occasions when we have a service need, the responsiveness of the Quantex staff is incredible. For a business like ours that depends on the uninterrupted flow of information to our customers, Quantex systems deliver everything we expected, and more, at an excellent value."**



**James Senecal, LAN Specialist, Pacific Life Insurance, Newport Beach, CA.**

---



## **THE MORE YOU KNOW, THE BETTER QUANTEX GETS.**

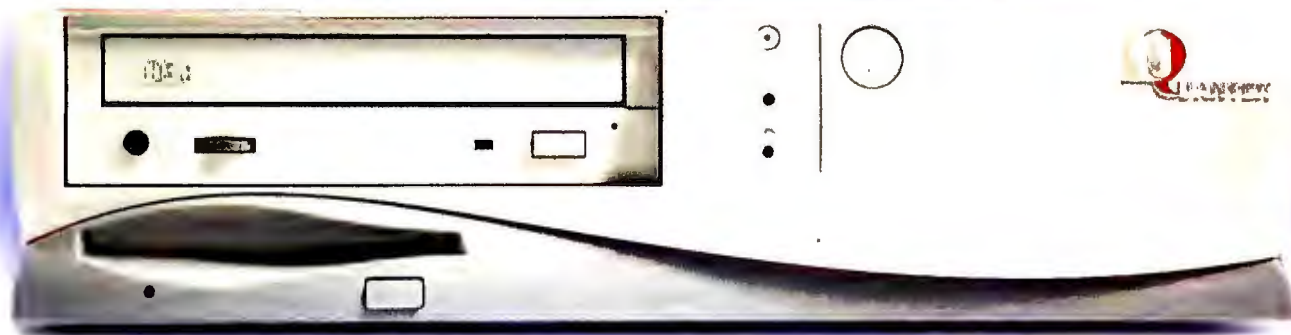
Quantex's excellent reputation among industry experts and experienced buyers grows stronger by the day. Time after time, the industry's top product reviewers have awarded our systems top honors including "Editors' Choice" and "Best Buy" awards. But when it comes to really knowing what we're about, it's business buyers—like you—who are the real experts. After researching, comparing, and buying Quantex systems, they understand exactly what's reflected in our awards and high industry scores for satisfaction and quality of technical support. In short, they've experienced the satisfaction of owning a Quantex. Still, there are people who don't know that we're one of the world's largest direct marketers of computer systems. After all, it takes time for perception to catch up to reality. So, we'd like to encourage everyone else to get to know us. The sooner the better.



# all the time.

**"Who says business systems have to look boring?  
You'll be the envy of the office with the  
stylishly curvaceous [Quantex] Slimline next to you."**

**c|net Comdex '98 Coverage**



## INTRODUCING A SMALL AND STYLISH REVOLUTION IN BUSINESS DESKTOP DESIGN—ONLY FROM QUANTEX.

Without sacrificing speed or performance, Quantex VX-Series Slimline PCs pack plenty of raw power and easy, built-in manageability into a small, elegant form factor. Up to 70% smaller than many standard desktops, this full-featured design is configured specifically for businesses and large corporations. Plus, our innovative QSentry technology and advanced network management features come integrated for greater system and network security.



Using up to 70% less desk space than standard desktops, the Quantex VX-Series will do wonders for all business environments.

**INTRODUCING!**

**Quantex VX-400c \$999**

**Business lease: \$35/Mo. Order Code #pcw0273**

- Intel® Celeron™ Processor 400MHz
- 32MB SDRAM Memory / 128KB Secondary Cache
- 4.3GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 15" Digital Monitor (13.8" viewable)
- Intel740 3D 2X AGP Graphics with 8MB SDRAM
- ▲ New Intel Pro 10/100 PCI Fast Ethernet Controller with RJ-45 and Wake-On-LAN Technology
- 32X Max Variable Speed CD-ROM Drive
- ESS Solo Wavetable Sound Card
- ▲ Quantex Slimline Case (12.9"x3.3"x14.2")
- 104-Key Keyboard with MS Mouse
- MS Windows 98
- ▲ QSentry Technology (Including Intel LANDesk Client Manager V3.1)

**INTRODUCING!**

**Quantex VX-400 \$1999**

**Business lease: \$70/Mo. Order Code #pcw0275**

- ▲ Intel® Pentium® II processor 400MHz
- 64MB SDRAM Memory / 512KB Secondary Cache
- 10.2GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- ▲ Quantex 15" LCD Flat-Panel Display
- Intel740 3D 2X AGP Graphics with 8MB SDRAM
- ▲ New Intel Pro 10/100 PCI Fast Ethernet Controller with RJ-45 and Wake-On-LAN Technology
- 32X Max Variable Speed CD-ROM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- ▲ Quantex Slimline Case (12.9"x3.3"x14.2")
- MS Natural Keyboard Elite with MS Mouse
- MS Windows 98
- ▲ QSentry Technology (Including Intel LANDesk Client Manager V3.1)
- Upgrade to Windows NT 4.0, add \$99

**Quantex VX-400 \$1499**  
Order Code #pcw0274

Above system with Pentium® II processor 400MHz, 128MB SDRAM, 10.2GB Ultra-ATA HD, and 17" Digital Monitor (15.8" viewable).

Quantex 15" LCD Flat-Panel



**CALL TODAY  
AND ORDER**

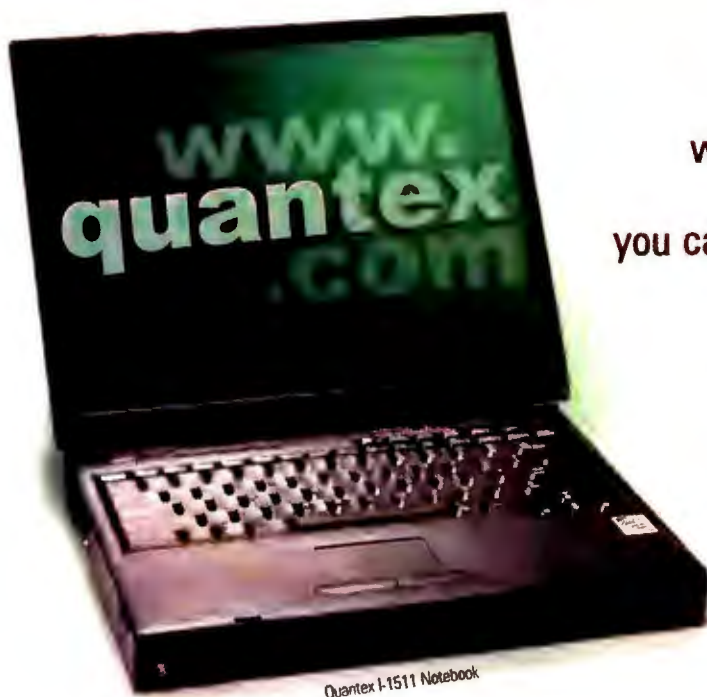
800-896-4898

[www.quantex.com/pcworld](http://www.quantex.com/pcworld)

In Canada, call 800-793-4167



# What those who



"A great buy for professionals who want a wide-screen notebook with very good performance... you can easily deploy the Quantex as a desktop replacement."

**WINLIST Award Windows Magazine (Oct. 98)**

Introducing the Quantex I-1511 Notebook—complete with a "XX-Large" 15" Active Matrix Display, powerful 96MB of SDRAM, massive 8GB hard drive, sharp ATI 3D AGP Video w/8MB and a built-in 56K V.90 fax/modem—for the incredible price of just \$2899.

## IF YOUR LAPTOP SAYS WHO YOU ARE, THE I-SERIES SAYS YOU'RE EXTREMELY POWERFUL

If you demand nothing less for yourself than all the convenience and flexibility of a laptop along with all the enterprise-shaking power of a mega desktop, you'll want to get to know the Quantex I series notebooks. They give you the fastest and most powerful Pentium® II processors, long lasting 12-cell lithium ion batteries, and built-in dual drive bays for simultaneous use of floppy and DVD- or CD-ROM. You also get stunning Active Matrix displays up to 15", and ATI AGP 3D graphics accelerators—all the juice you need to flex your multimedia muscle. You get the idea. Everything you need to know about portable computing power is right on this page.



Big On Screen. Small On Price  
Quantex I-Series notebooks are now available with "XX-Large" 15" displays. Check them out starting at just \$2499.

### I-SERIES NOTEBOOKS

#### Quantex I-1410 \$2199

- Business lease: \$77/Mo.** Order Code #pcw0258
- Pentium® II processor 266MHz
  - 14.1" XGA Active Matrix Display
  - 64MB SDRAM
  - 4GB Ultra-ATA HD
  - 56K V.90 Fax/Modem
  - Removable Combo 24X CD-ROM Drive & 3.5" Floppy Drive
  - ▲ New ATI Rage Lt Pro 3D AGP Video w/BMB
  - New ESS 3D Wavetable Surround Sound and Speakers
  - ▲ New Long-Lasting 12-Cell Smart Lithium Ion Battery
  - USB and Fast IR Ports / Integrated Personal Touchpad
  - MS Windows 98
  - Microsoft Office 97 SBE v2.0
  - Quantex Carrying Case
  - ▲ Year 2000 Compliant
  - 3-year limited warranty on CPU and Main Memory
  - 1-Year parts and labor warranty on all other components
  - Upgrade from 64MB SDRAM to 128MB SDRAM, add \$149
  - Upgrade from 4GB Ultra-ATA HD to 8GB Ultra-ATA HD, add \$129

### INTRODUCING!

#### Quantex I-1510 \$2499

- Business lease: \$88/Mo.** Order Code #pcw0260
- Pentium® II processor 266MHz
  - ▲ 15" XGA Active Matrix Display
  - 64MB SDRAM
  - 6GB Ultra-ATA HD
  - 56K V.90 Fax/Modem
  - Removable Combo 2X DVD-ROM Drive & 3.5" Floppy Drive
  - ▲ New ATI Rage Lt Pro 3D AGP Video w/BMB
  - New ESS 3D Wavetable Surround Sound and Speakers
  - ▲ New Long-Lasting 12-Cell Smart Lithium Ion Battery
  - USB and Fast IR Ports / Integrated Personal Touchpad
  - MS Windows 98
  - Microsoft Office 97 SBE v2.0
  - Quantex Carrying Case
  - ▲ Year 2000 Compliant
  - 3-year limited warranty on CPU and Main Memory
  - 1-Year parts and labor warranty on all other components
  - Upgrade from 64MB SDRAM to 128MB SDRAM, add \$149
  - Upgrade from 6GB Ultra-ATA HD to 8GB Ultra-ATA HD, add \$199

#### Quantex I-1411 \$2699

- Business lease: \$94/Mo.** Order Code #pcw0259
- Pentium® II processor 300MHz
  - 14.1" XGA Active Matrix Display
  - 128MB SDRAM
  - 6GB Ultra-ATA HD
  - 56K V.90 Fax/Modem
  - Removable Combo 2X DVD-ROM Drive & 3.5" Floppy Drive
  - ▲ New ATI Rage Lt Pro 3D AGP Video w/BMB
  - New ESS 3D Wavetable Surround Sound and Speakers
  - ▲ New Long-Lasting 12-Cell Smart Lithium Ion Battery
  - USB and Fast IR Ports / Integrated Personal Touchpad
  - MS Windows 98
  - Microsoft Office 97 SBE v2.0
  - Quantex Carrying Case
  - ▲ Year 2000 Compliant
  - 3-year limited warranty on CPU and Main Memory
  - 1-Year parts and labor warranty on all other components
  - Upgrade from 6GB Ultra-ATA HD to 8GB Ultra-ATA HD, add \$199

### INTRODUCING!

#### Quantex I-1511 \$2899

- Business lease: \$101/Mo.** Order Code #pcw0261
- Pentium® II processor 300MHz
  - ▲ 15" XGA Active Matrix Display
  - 96MB SDRAM
  - ▲ 8GB Ultra-ATA HD
  - 56K V.90 Fax/Modem
  - Removable Combo 2X DVD-ROM Drive & 3.5" Floppy Drive
  - ▲ New ATI Rage Lt Pro 3D AGP Video w/BMB
  - New ESS 3D Wavetable Surround Sound and Speakers
  - ▲ New Long-Lasting 12-Cell Smart Lithium Ion Battery
  - USB and Fast IR Ports / Integrated Personal Touchpad
  - MS Windows 98
  - Microsoft Office 97 SBE v2.0
  - Quantex Carrying Case
  - ▲ Year 2000 Compliant
  - 3-year limited warranty on CPU and Main Memory
  - 1-Year parts and labor warranty on all other components
  - Upgrade from 96MB SDRAM to 128MB SDRAM, add \$99

### I-Series Upgrade Options:

- Quantex Mini-Docking Station...add \$149
- 12-Cell Long-Lasting Lithium Ion Battery...add \$149
- PCMCIA Network Interface Card...add \$129
- Quantex Deluxe Carrying Case...add \$99



# know, know.



"The Quantex QP6/SB-4 is a sturdy, practical machine. Designed for the business user...it comes with the creature comforts that anyone putting in overtime would appreciate. Good price and top-notch support policy."

PC World (June 98)



## BUILT-IN ADVANCED MANAGEMENT CAPABILITIES LOWER YOUR TOTAL COST OF OWNERSHIP

Whether your business is at home or spread across the globe, the enterprise management technology integrated into our Business Desktops will add real value while lowering your total cost of ownership. Built according to industry-standard initiatives such as Wired for Management, DMI 2.0, PC98 and ACPI, these systems incorporate capabilities for improved asset management as well as remote configurations and diagnostics. Plus, our advanced QSentry Technology assures unsurpassed confidence and security at all times by constantly monitoring the health of your Quantex PCs. Why settle for simple performance when your business can also benefit from compliance and assurance?

### Windows® 2000 Ready PCs

Quantex's Windows 2000-Ready Business Desktops come installed with Windows NT Workstation 4.0 to protect your technology investment by providing an optimal upgrade path for future hardware advances and the highly anticipated Windows 2000 operating system.

#### BUSINESS DESKTOPS

##### QP6/333 SB-1c \$999

Business lease: \$35/Mo. Order Code #pcw0230

- Intel® Celeron™ Processor 333MHz
- 32MB SDRAM Memory / 128KB Secondary Cache
- 4.3GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 17" Digital Monitor (15.8" viewable)
- 64-bit 3D AGP Graphics Card with 4MB SDRAM
- ▲ New Intel Pro 10/100 PCI Fast Ethernet Controller w/RJ-45 and Wake-On-LAN Technology
- 32X Max Variable Speed CD-ROM Drive
- 2 Universal Serial Bus (USB) Ports / DMI 2.0
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows 98
- 3-year limited warranty with 1-year On-Site Service\*
- 24-hr/7-day Technical Support
- DSentry Technology (Including Intel LANDesk Client Manager V3.1)
- ▲ Cable Modem Ready / Year 2000 Compliant

##### QP6/400 SB-1c

\$1199

Order Code #pcw0231

Above system with Intel Celeron processor 400MHz, 64MB SDRAM, 6.4GB HD

##### QP6/400 SB-2

\$1499

Order Code #pcw0232

Above system with Intel Pentium II processor 400MHz, 64MB SDRAM, 8.4GB HD, Intel740 3D AGP Video w/8MB and MS Office '97 SBE v2.0

##### QP6/450 SB-3 \$1899

Business lease: \$67/Mo. Order Code #pcw0233

- Pentium® II processor 450MHz
- 64MB PC100 SDRAM Memory / 512KB Secondary Cache
- 8.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- ▲ 17" Monitor w/DSD & NEC ChromaClear CRT (16.0" viewable), 1600x1200 max resolution, 25dp
- Intel740 3D 2X AGP Graphics w/8MB SDRAM
- ▲ New Intel Pro 10/100 PCI Fast Ethernet Controller w/RJ-45 and Wake-On-LAN Technology
- 32X Max Variable Speed CD-ROM Drive
- 2 Universal Serial Bus (USB) Ports / DMI 2.0
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS IntelliMouse
- ▲ MS Windows NT Workstation 4.0 / Microsoft Office 97 SBE v2.0
- 3-year limited warranty with 1-year On-Site Service\*
- 24-hr/7-day Technical Support
- DSentry Technology (Including Intel LANDesk Client Manager V3.1)
- ▲ Cable Modem Ready / Year 2000 Compliant / Windows 2000 Ready

##### QP6/450 SB-4

\$2199

Order Code #pcw0234

Above system with 128MB SDRAM, 13GB HD, New Ultra-Fast #9 Revolution IV 128-bit 3D AGP Video & 19" Digital Monitor (18.1" viewable)



**CALL TODAY  
AND ORDER**

800-896-4898

[www.quantex.com/pcworld](http://www.quantex.com/pcworld)

In Canada, call 800-793-4167



## VALUE MULTIMEDIA

### QP6/400 M-1c \$1099

**Business lease: \$39/Mo.** Order Code #pcw0205

- New Intel® Celeron® Processor 400MHz
- 64MB SDRAM Memory / 128KB Secondary Cache
- 6.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 15" Digital Monitor (13.8" viewable)
- 64-Bit 3D AGP Graphics Accelerator with 4MB
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- 32X Max Variable Speed CD-ROM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- Altec-Lansing ACS-90 Speakers
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows 98 / Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Upgrade to 17" Digital Monitor (15.8" viewable), add \$89
- Upgrade to 8MB AGP Graphics Accelerator, add \$39

QP6/333 M-1c(with Intel Celeron processor).....\$1049  
QP6/350 M-1x(with Pentium II processor).....\$1149

## POWER MULTIMEDIA

### QP6/350 SM-1x \$1399

**Business lease: \$49/Mo.** Order Code #pcw0220

- Pentium® II Processor 350MHz
- 64MB PC100 SDRAM Memory / 512KB Secondary Cache
- 8.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 17" Digital Monitor w/OSD (15.8" viewable)
- Intel740™ 3D 2X AGP Graphics with BMB SDRAM
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- 32X Max Variable Speed CD-ROM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- Altec-Lansing ACS-90 Speakers
- Quantex ATX Mid Tower Case
- MS Natural Keyboard Elite with MS IntelliMouse
- MS Windows 98
- Power Multimedia Software Bundle
- Microsoft Office 97 SBE v2.0
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Upgrade to 10.2GB Ultra-ATA Hard Drive, add \$49
- Upgrade to 3rd-Gen. 4.8X DVD-RDM Drive, add \$79
- Upgrade to Altec Lansing ACS-45.1 PowerCube Speakers with Subwoofer, add \$49
- Optional Internal Zip Drive w/one cartridge, add \$79

## SUPER MULTIMEDIA

### QP6/450 M-4x SE \$2199

**Business lease: \$77/Mo.** Order Code #pcw0209

- Pentium® II Processor 450MHz
- ▲ 128MB PC100 SDRAM Memory / 512KB Secondary Cache
- ▲ New 17.2GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- ▲ New 19" Monitor w/NEC ChromaClear CRT (18.1" viewable), 1600x1200, .25dp
- Intel740™ 3D 2X AGP Graphics with BMB SDRAM
- ▲ Internal 100MB Zip Drive with one cartridge
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- New 3rd-Generation 4.8X DVD-RDM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- Altec-Lansing ACS-90 Speakers
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows 98
- Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Optional Altec Lansing ACS-251 Subwoofer, add \$39

QP6/400 M-4xSE(with Pentium II processor).....\$1999

SOFTWARE: Corel Office Suite B • Internet the City • Compton's Interactive Encyclopedia • Body Works 6.0 • Amazon Trail II • MS Money '97 (pre-loaded only) • American Heritage Talking Dictionary • Dr. Solomons Find-Virus (pre-loaded only) • Compton's Reference Collection • MS Internet Explorer 4.0

### QP6/400 M-2x \$1499

**Business lease: \$53/Mo.** Order Code #pcw0206

- Pentium® II Processor 400MHz
- 64MB SDRAM Memory / 512KB Secondary Cache
- 8.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 17" Digital Monitor w/OSD (15.8" viewable)
- Toshiba MPACT2 3D/DVD Media Accelerator w/8MB RDRAM
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- ▲ New 3rd-Generation 4.8X DVD-ROM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- Altec-Lansing ACS-90 Speakers
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows 98 / Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Upgrade to 17" Monitor w/NEC ChromaClear CRT for \$79
- Optional Internal Zip Drive w/one cartridge, add \$79
- Optional Altec Lansing ACS-251 Subwoofer, add \$39

QP6/350 M-2x(with Pentium II processor).....\$1349  
QP6/450 M-2x(with Pentium II processor).....\$1699

SOFTWARE: MS Office 97 Small Business Edition v2.0 • MS Money '97 (pre-loaded only) • Office Mate • Day Planner Pro • Power Business Plans • Form Designer • Project Manager Pro • Labels Unlimited • Compton's Reference Collection • Dr. Solomons Find-Virus (pre-loaded only) • MS Internet Explorer 4.0

### QP6/400 SM-2x \$1799

**Business lease: \$63/Mo.** Order Code #pcw0221

- Pentium® II Processor 400MHz
- ▲ 128MB PC100 SDRAM Memory / 512KB Secondary Cache
- ▲ 13GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 17" Digital Monitor w/OSD (15.8" viewable)
- ▲ New 3Dfx 128-bit Voodoo Banshee 3D AGP Video w/16MB
- Based on award-Winning Voodoo2 3D Technology
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- ▲ New 3rd-Generation 4.8X DVD-RDM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- Altec-Lansing ACS-90 Speakers
- Quantex ATX Mid Tower Case
- MS Natural Keyboard Elite with MS IntelliMouse
- MS Windows 98 / Power Multimedia Software Bundle
- Microsoft Office 97 SBE v2.0
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Upgrade to Altec Lansing ACS-45.1 PowerCube Speakers with Subwoofer, add \$49
- Optional Internal Zip Drive w/one cartridge, add \$79

QP6/350 SM-2x(with Pentium II processor).....\$1649

### QP6/400 M-3x \$1599

**Business lease: \$56/Mo.** Order Code #pcw0207

- Pentium® II Processor 400MHz
- 64MB PC100 SDRAM Memory / 512KB Secondary Cache
- 10.2GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 17" Digital Monitor w/OSD (15.8" viewable)
- Toshiba MPACT2 3D/DVD Media Accelerator w/BMB RDRAM
- ▲ Internal 100MB Zip Drive with one cartridge
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- ▲ New 3rd-Generation 4.8X DVD-ROM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- Altec-Lansing ACS-90 Speakers
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows 98
- Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Upgrade to 17" Monitor w/NEC ChromaClear CRT for \$79

QP6/350 M-3x(with Pentium II processor).....\$1449  
QP6/450 M-3x(with Pentium II processor).....\$1799

### QP6/400 SM-3x \$1999

**Business lease: \$70/Mo.** Order Code #pcw0222

- Pentium® II Processor 400MHz
- ▲ 128MB PC100 SDRAM Memory / 512KB Secondary Cache
- 13GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- ▲ 19" Monitor w/OSD (18.1" viewable), 1600x1200, .25dp
- ▲ New 3Dfx 128-bit Voodoo Banshee 3D AGP Video w/16MB
- Based on award-Winning Voodoo2 3D Technology
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- New 3rd-Generation 4.8X DVD-RDM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- Altec-Lansing ACS-45.1 PowerCube Speakers w/subwoofer
- Quantex ATX Mid Tower Case
- MS Natural Keyboard Elite with MS IntelliMouse
- MS Windows 98 / Power Multimedia Software Bundle
- Microsoft Office 97 SBE v2.0
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Upgrade to Ultra-Fast #9 Revolution IV 128-bit 3D AGP Video w/32MB, add \$49
- Optional Internal Zip Drive w/one cartridge, add \$79

QP6/450 SM-3x(with Pentium II processor).....\$2199

## ULTIMATE GAMING PCS

### QP6/400 GX-1c \$1499

**Business lease: \$52/Mo.** Order Code #pcw0240

- New Intel® Celeron® Processor 400MHz
- 64MB SDRAM Memory / 128KB Secondary Cache
- 13GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 17" Digital Monitor w/OSD (15.8" viewable)
- Intel740™ 3D 2X AGP Graphics with BMB SDRAM
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- 32X Max Variable Speed CD-ROM Drive
- ▲ Aureal "A3D" 3D Positional PCI Sound
- ▲ 3Dfx Voodoo2 based 3D Game Accelerator w/12MB
- MS SideWinder Precision Pro Joystick
- Altec-Lansing ACS-45.1 PowerCube Speakers w/subwoofer
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows 98 / Value Multimedia Software Bundle
- ▲ Activision Game Titles: Battlezone, Heavy Gear Interstate 76 w/Nitro Pack
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Upgrade to 17" Monitor w/NEC ChromaClear CRT for \$79

### QP6/450 Best Buy \$1999

**Business lease: \$70/Mo.** Order Code #pcw0208

- Pentium® II Processor 450MHz
- ▲ 128MB PC100 SDRAM Memory / 512KB Secondary Cache
- ▲ 13GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- ▲ 19" Monitor w/OSD (18.1" viewable), 1600x1200, .25dp
- Intel740™ 3D 2X AGP Graphics with BMB SDRAM
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- ▲ New 3rd-Generation 4.8X DVD-ROM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- Altec-Lansing ACS-90 Speakers
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows 98 / Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Optional Internal Zip Drive w/one cartridge, add \$79
- Optional Altec Lansing ACS-251 Subwoofer, add \$39

QP6/400 Best Buy(with Pentium II processor).....\$1849

### QP6/450 SM-4x \$2399

**Business lease: \$84/Mo.** Order Code #pcw0223

- Pentium® II Processor 450MHz
- ▲ 128MB PC100 SDRAM Memory / 512KB Secondary Cache
- ▲ New 17.2GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- ▲ New 19" Monitor w/NEC ChromaClear CRT (18.1" viewable), 1600x1200, .25dp
- ▲ New 3Dfx 128-bit Voodoo Banshee 3D AGP Video w/16MB
- Based on award-Winning Voodoo2 3D Technology
- ▲ Internal 100MB Zip Drive with one cartridge
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- New 3rd-Generation 4.8X DVD-ROM Drive
- SoundBlaster AudioPCI 64V Wavetable 3D Sound
- ▲ New Altec-Lansing ADA-305 Dolby Pro Logic Surround Sound Speakers with subwoofer
- Quantex ATX Mid Tower Case
- MS Natural Keyboard Elite with MS IntelliMouse
- MS Windows 98 / Power Multimedia Software Bundle
- Microsoft Office 97 SBE v2.0
- 3-year limited warranty with 1-year On-Site Service\*\*
- ▲ Year 2000 Compliant
- Upgrade to Ultra-Fast #9 Revolution IV 128-bit 3D AGP Video w/32MB, add \$49

### QP6/450 GX-2 \$2399

**Business lease: \$84/Mo.** Order Code #pcw0242

- Pentium® II Processor 450MHz
- ▲ 128MB PC100 SDRAM Memory / 512KB Secondary Cache
- 13GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- ▲ 19" Monitor w/OSD (18.1" viewable), 1600x1200, .25dp
- Intel740™ 3D 2X AGP Graphics with BMB SDRAM
- ▲ Internal 100MB Zip Drive with one cartridge
- 56K V.90 PCI Fax/Modem\* w/Voice Mail and Speakerphone
- New 3rd-Generation 4.8X DVD-ROM Drive
- ▲ Aureal "A3D" 3D Positional PCI Sound
- ▲ New Dual 3Dfx Voodoo2 SLI 3D Game Accelerator w/24MB (2X more powerful than single Voodoo2 accelerator)
- MS SideWinder Precision Pro Joystick
- ▲ New Altec-Lansing ADA-305 Dolby Pro Logic Surround Sound Speakers & subwoofer
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows 98 / Value Multimedia Software Bundle
- ▲ Activision Game Titles: Battlezone, Heavy Gear Interstate 76 w/Nitro Pack
- ▲ Year 2000 Compliant

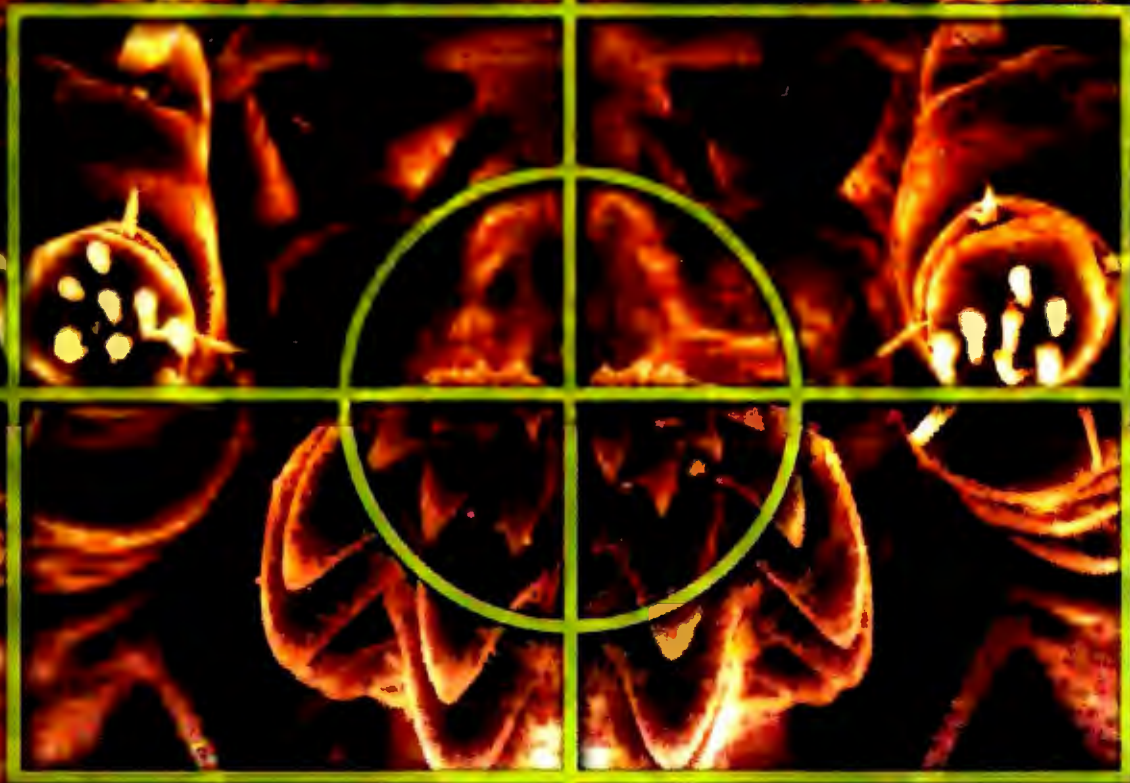


© 1999 Quantex Microsystems, Inc. All Rights Reserved, 400B Pierce Street, Somerset NJ 08873 Sales Hours: M-F 8 a.m. - 12 a.m. (ET) - Sat., 9 a.m. - 6 p.m. All desktop system sales are subject to Quantex's three-year limited warranty and terms and conditions of sale. The three-year limited warranty includes first year, parts and labor. Second and third years, parts only warranty. \*\*No on-site service is available outside of the continental USA. On-site service is provided at the sole discretion of Quantex. A diagnostic determination for on-site service must be made by a Quantex technician. On-site service is provided by an independent third-party provider. For details on our warranty or money-back guarantee call or write us. Other peripherals such as printers, joysticks, etc., are covered by manufacturer's warranty. Software titles are subject to change and cannot be substituted. All prices and configurations are subject to change without notice or obligation and do not include shipping or sales tax. All returned items must have a conspicuous RMA number issued by Quantex and be in original packaging. 30-day conditional money-back policy does not include return freight or original shipping/handling charges. Maximum transmission speed of up to 56kbps when downloading and 33.6kbps when uploading data. Actual speeds may vary depending on line conditions and current FCC restrictions. \*Height and weight dimensions refer to Quantex T-Series Notebook with 14.1" display and floppy disk drive module. \*Wake-On-LAN is currently not supported through routers. Quantex is not responsible for errors in typography or photography. Intel, Pentium and the Intel Inside logo are registered trademarks and MMX and Celeron are trademarks of Intel. All other company trademarks are trademarks of each respective company.

**CALL TODAY AND ORDER**  
**QUANTEX**  
**800-896-4898**  
**www.quantex.com/pcworld**  
In Canada, call 800-793-4167



**Computer viruses are nastier and sneakier than ever. Show them no mercy. Inoculate your system with one of these ruthless virus-killers.**



BY STAN MIASTKOWSKI

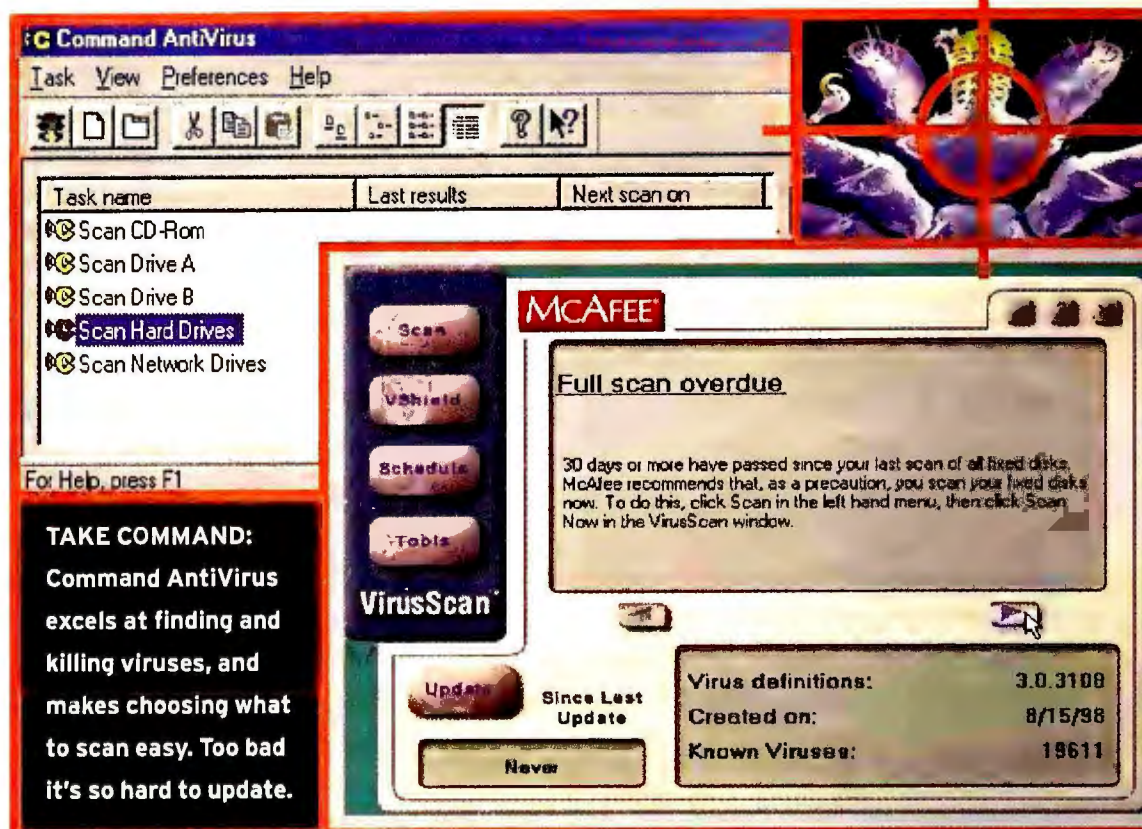
# Virucide!



viruses in existence are variations on relatively simple themes. The most successful viruses either cause very little damage or include time delays that postpone their damage until days, weeks, or months after they infect your PC. One current example of the time-delay type—a variant of the CIH virus—activates on the 26th of each month and can destroy data on your hard drive. In part because of the widespread publicity it has generated, CIH has caused little damage so far.

Macro viruses are getting more destructive every year. Though most cause no systemwide data damage, macro viruses that affect Excel worksheets can wreak havoc. Case in point: XM/Compat searches Excel worksheets for unprotected data and then makes small, random changes to some data while keeping the number of characters the same. Though current antivirus software can easily detect XM/Compat and remove it, there's no way to fix the damage other than to restore the data from a backup—assuming you have one.

You probably hear episodically about new viruses, mostly via e-mail. But many rumored invaders are urban legends, and the warning message itself, as it gets forwarded and reforwarded, becomes like a virus. To distinguish the real from the mythical, check the U.S. Department of Energy's Computer Incident Advisory Capability Web site at [ciac.llnl.gov/ciac](http://ciac.llnl.gov/ciac), or the independent Computer Virus Myths site at [www.kumite.com/myths](http://www.kumite.com/myths).



**TAKE COMMAND:**  
Command AntiVirus excels at finding and killing viruses, and makes choosing what to scan easy. Too bad it's so hard to update.

### COMMAND ANTIVIRUS 4.52

**PRO:** Low price, nearly perfect virus detection, simple interface

**CON:** Complex update process, some difficulty with wild virus repair

COMMAND ANTIVIRUS, a simple product that does the job without a lot of fanfare, has one fatal weakness: It's so hard to update that we can't recommend it.

Formerly known as F-Prot Professional, this inexpensive (\$40) package matched McAfee and Norton in detecting 100 percent of wild viruses. Command ran into trouble repairing wild file and boot viruses, fixing the files only partially. But the

**HELLO, CENTRAL:** McAfee's VirusScan Central provides a handy remote-control-like panel that gives you easy access to program components and status messages through

program's performance with the common AntiEXE virus—which Command didn't automatically remove from the main boot record—emerged as a more serious deficiency. Though users can overcome the virus manually by booting from a DOS floppy disk and using the package's rescue disk, Command, unlike the other packages, doesn't create a bootable rescue disk at installation—an aggravating obstacle when you need fast help.

## ANTIVIRUS SOFTWARE

## FEATURES COMPARISON

PRODUCT	Street price (12/2/98)	Platforms supported	Scan scheduler	Automatic virus signature updates	Tech support hours (weekday/weekend)	Toll-free phone support	PC World InfoNet number
Command AntiVirus 4.52 561/575-3200 <a href="http://www.commandcom.com">www.commandcom.com</a>	\$40	Windows 95/98, NT, 3.1; DOS; OS/2; NetWare	●	○	24/24	●	641
McAfee VirusScan 4.0 800/338-8754 <a href="http://www.mcafee.com">www.mcafee.com</a>	\$49	Windows 95/98, NT, 3.1; DOS; OS/2	●	●	8/0	○	642
Norton AntiVirus 5.0 800/441-7234 <a href="http://www.symantec.com">www.symantec.com</a>	\$40	Windows 95/98 <sup>1</sup>	●	●	9/0	●	643
Panda Antivirus 6.005 Platinum 800/603-4922 <a href="http://www.pandasoftware.com">www.pandasoftware.com</a>	\$59	Windows 95/98, NT, 3.1; DOS; OS/2	●	●	24/24	●	644
Sophos Anti-Virus 3.13 888/767-4679 <a href="http://www.sophos.com">www.sophos.com</a>	\$99	Windows 95/98, NT, 3.1; DOS; OS/2; Netware	●	○ <sup>2</sup>	24/24	● <sup>3</sup>	645
Trend PC-cillin 6 <sup>4</sup> 800/228-5651 <a href="http://www.antivirus.com">www.antivirus.com</a>	\$40 <sup>5</sup>	Windows 95/98	●	●	11/0	○	646
InDefense 2.10 877/472-3372 <a href="http://www.indefense.com">www.indefense.com</a>	\$50	Windows 95/98, NT, 3.1; DOS	○	6	10.5/0	●	647



Best Buy

● Yes ○ No

<sup>1</sup> Package includes version 4.0, which also supports Windows 3.1, DOS, and NT 3.51.

<sup>2</sup> \$249 for version with one year of updates.

<sup>3</sup> Calls toll-free on weekdays only.

<sup>4</sup> Prerelease version.

<sup>5</sup> For a hard copy sold only via the Web. Download-only version costs \$30.

<sup>6</sup> Product does not require updates.

All products: 904



# PC WORLD

## 65% Savings Plus a Free CD

☒ **Yes.** Send me PC WORLD and my FREE PC WORLD CD-ROM! I'll pay just \$24.95 for 12 monthly issues—65% off the annual newsstand rate.

**Please rush my FREE CD-ROM!**

NAME

COMPANY

ADDRESS

CITY / STATE / ZIP

E-MAIL (OPTIONAL)

Offer good in the US only. For delivery in Mexico, please add \$20 USD per subscription for postage. In Canada, please add \$20 for postage, plus 7% GST (#124669680). All other countries send \$70.95 USD to PC World, P.O. Box 55029, Boulder, CO 80322-5029, USA. Savings based on US newsstand rate of \$71.88.

4PAN9



### PC WORLD CD-ROM

Loaded with great Shareware programs — including complete applications, utilities, Internet tools, games, video clips and more. This CD-ROM is absolutely FREE!



Plug into PC WORLD Online now!  
<http://www.pcworld.com>



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

FIRST-CLASS MAIL PERMIT NO. 1262 BOULDER CO

POSTAGE WILL BE PAID BY ADDRESSEE

**PC WORLD**

SUBSCRIPTION DEPARTMENT  
PO BOX 51833  
BOULDER CO 80323-1833





# The Rise and Fall of a Macro Virus

1. EvilMacro, a macro virus program, is written in the compiled Visual Basic language. Its mission: to feed false data into a Microsoft Excel file.

```
Sub EvilMacro()  
:  
Change data  
:  
End Sub
```

```
Sub GoodMacro()  
:  
Call EvilMacro  
:  
End Sub
```

2. A line of code is inserted into a clean Excel macro, GoodMacro, instructing it to call up EvilMacro. (GoodMacro starts the wheel turning; EvilMacro does the dirty work.)

3. Both of these macros are added to an innocuous Excel document, which is sent to an unsuspecting recipient. The recipient opens the document and enables the macros. GoodMacro runs first, calling up EvilMacro, which changes data in the Excel file.

4. An antivirus program is launched. It examines all the macro code and recognizes the virus signature—the pattern of binary code indicative of that particular virus.

5. The antivirus program attempts to remove the virus code from within the macro code, leaving the macro itself intact. Voilà, clean file!

Command's uncluttered, easy-to-use interface offers a solid set of crucial features, including extensive reporting options and a simple scheduler that lets you set up automatic, periodic, full-system scans. It's backed by nonstop toll-free support and one year of free updates. Alas, the complexity of Command's update process makes it a no-go for most users. The package reminds you when your virus signatures are out of date, but you must obtain a user name and password to access the latest code from the Web site. After downloading the updates, you have to wrestle with a complex definition-installation process that's explained only in the widely unread README file.

## McAfee VirusScan 4.0

**PRO:** Outstanding virus detection and removal, remote-control-like interface, easy to use

**CON:** Slowest scan time

AS MAKER OF one of the oldest and most popular antivirus packages, McAfee has a reputation for effectiveness and cutting-edge features to uphold. With the \$49 McAfee VirusScan 4.0, the runner-up to our Best Buy, it succeeds. VirusScan performed perfectly on wild virus detection (like Command and Norton) and repair (like Panda), and strongly on zoo viruses. Its one major drawback is scan speed; McAfee took two to three times longer to

scan a 1GB hard drive than the other packages. If you always schedule full-system scans for evenings and other off-peak times, this won't pose a problem, but if you want to scan during peak hours, you'll have a long wait.

A new remote-control-like interface called VirusScan Central makes navigating through McAfee's many features easy. Buttons that perform common tasks appear prominently in front, while other, less conspicuous buttons lead you to more advanced or specialized settings. Useful messages pop up each time you start VirusScan, reminding you to perform such common (and es-

sential) chores as updating your virus signatures. A simple wizard guides you through a multitude of settings and choices. The package actively scans all e-mail attachments and downloaded files before you open them, and it offers protection against the notorious ActiveX and Java applets; it even includes a miniature firewall that lets you block access to certain unwanted Web sites or IP addresses—a useful filter for parents. ▶

## TIPS FROM THE REAL WORLD

**Michael Brozovich**, an Arkansas-based real estate broker, doesn't believe in using antivirus software. He thinks antivirus makers "use scare tactics to sell software" and is perturbed by antivirus software's "constant updates, potential conflicts with other software, and performance hits." Brozovich admits luck has contributed to his success in avoiding viruses so far. His "gospel rules":

- Don't accept disks from friends. Even well-meaning people can pass along contaminated files.
- Don't download Internet files, especially from news-groups. If you must do so, take your chances with large commercial sites, which are more likely to check files for viruses before posting them.
- Don't open executable files attached to email. Just delete the messages.







## Portability.



**Style.** Never before has a computer so elegantly streamlined offered such formidable power. Presenting Portégé™ 3010CT. A sculpted sliver of magnesium-alloy casing. Concealing the greatest capabilities Toshiba has ever offered in a portable this compact. It's the executive privilege with a very practical purpose.



**Size.** It's the ultimate traveling companion. Barely three-quarters of an inch thin. Under 3 lbs. light. Portégé 3010CT travels discretely wherever you go, yet it offers features like a full-sized keyboard and a generous 10.4" TFT active matrix display.





The perfect balance.

## Performance.



**Power.** Portégé 3010CT is ready for virtually anything. An Intel Pentium® processor with MMX™ technology, 266MHz. A 4.3 billion-byte hard drive. 32MB of high speed EDO DRAM and a 128-bit NeoMagic™ graphics controller. Plus a 56K modem.



**Expansion.** The possibilities are endless. With an optional lightweight battery, two PC Card slots, an optional PC Card 24X\* CD-ROM and standard port expander. It's the ideal balance of portability and performance. Call 1-800-TOSHIBA or click on [www.toshiba.com](http://www.toshiba.com).

# TOSHIBA

The World's Best Selling Portable Computers.



# Wild Viruses Lassoed With Ease

Command, McAfee, and Norton share perfect records on wild virus detection.

ANTIVIRUS PROGRAM <sup>1</sup>	Wild boot virus detection (percent)	Wild file virus detection (percent)	Wild macro virus detection (percent)	Zoo file virus detection (percent)	Zoo macro virus detection (percent)	Detect/repair wild macro virus	Detect/repair wild file virus	Detect/repair wild boot virus	Detect/repair main boot record infection	False positives	Scan time (minutes:seconds)
Command AntiVirus 4.52	100	100	100	99	98	●/●	●/○ <sup>2</sup>	●/○ <sup>2</sup>	○/○	0	9:24
McAfee VirusScan 4.0	100	100	100	95	100	●/●	●/●	●/●	●/●	0	27:22
Norton AntiVirus 5.0*	100	100	100	99	100	●/●	●/●	●/●	●/○	1	12:54
Panda Antivirus 5.0	100	99.9	99.9	80.6	75.5	●/●	●/●	●/●	●/●	12	7:42
Sophos Anti-Virus 3.13	100	100	99.9	99	100	●/●	●/○	●/●	●/○	2	8:30
Trend PC-cillin 6 <sup>3</sup>	100	99.9	99.9	99	100	●/●	●/●	●/○	●/●	2	13:26

\*Best Buy

● = yes ○ = no

Faster




**TEST HOW WE TEST** On a Compaq Pentium II-266 DeskPro PC, Joe Wells of the Antivirus Test Lab at Wells Research tested each package's ability to detect 80 wild boot viruses, 89 wild file viruses, 21 polymorphic viruses, 85 wild macro viruses, 6124 samples of 6124 zoo file viruses, and 4482 samples of 1736 zoo macro viruses; and to remove 17 wild viruses, including the 15 most commonly reported. Each test used the most current virus signatures available on the vendor's Web site as of October 6, 1998. The scan test measured time to review 10,973 files on a 1GB hard drive. <sup>1</sup>Tegam InDefense Pro 2.10 could not be tested using these procedures; see "InDefense: An Antivirus Utility With a Difference," on page xxx. <sup>2</sup>Partial repair. <sup>3</sup>Prerelease version.

Updating VirusScan is easy and automatic. A pop-up dialog box reminds you to refresh, supplying a button to connect directly to McAfee's Web site. If you want to receive updates as soon as they're available, McAfee will "push" updates directly to your PC via e-mail; none of the other reviewed programs has the same feature. The company claims to provide daily updates if the need arises and free signature updates "for the life of the product"—that is, until the next version of VirusScan comes out, when the format of the signature files may change.

## NORTON ANTIVIRUS 5.0

**PRO:** Excellent virus detection and removal, effective new features such as Quarantine, improved interface

**CON:** Begins to charge for virus signature updates after one year

 **OUR BEST BUY** in both last year's roundup and this year's, Norton AntiVirus remains a step ahead of its competitors with version 5.0. With top-notch protection, an idiot-proof interface, simple updating, and a wealth of truly useful features, it won easily.

Like Command and McAfee, NAV detected 100 percent of the wild viruses, and it found more zoo viruses than any other package (over 99 percent). The program produced two minor testing prob-

lems that shouldn't affect most users: It produced one false positive, reporting a virus when none existed. And it retains a design flaw we encountered last year: When we infected the main boot record, the package hung the system without telling us what to do. A working fix (which we tested) is available on Symantec's Web site.

Norton AntiVirus 5.0 includes several useful new features. The program now automatically detects malevolent ActiveX and Java applets—if they show up. The program's Quarantine

feature tucks infected files away in a protected area while you check online for a fix or contact Symantec tech support. Scan and Deliver encodes suspected viruses and e-mails them directly to Symantec's

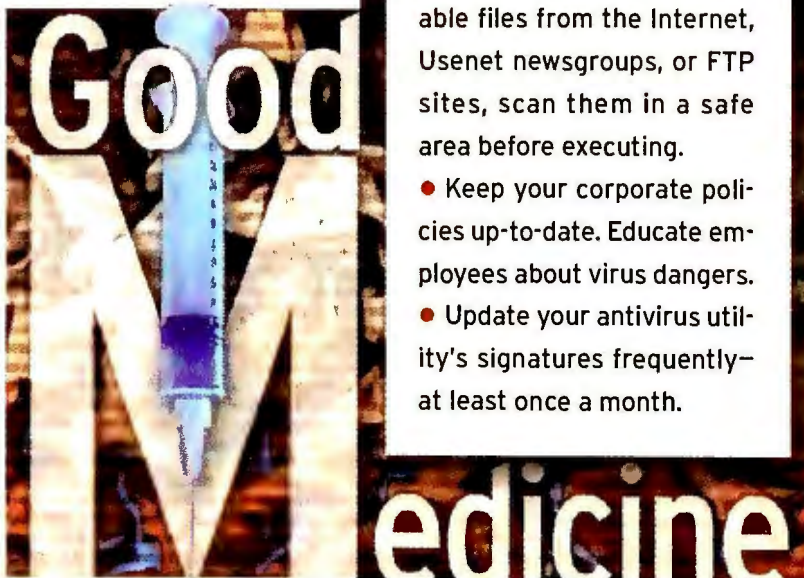
AntiVirus Research Center for a possible fix. When the easy-to-install program finds a virus, it clearly shows you what to do; a new, cleaner interface puts major choices out in front, making its most frequently used features more accessible.

Updating NAV is simple: The program doesn't offer McAfee's push technology, but it will automatically download new signatures via the Internet or remind you when it's time to do so. Most conveniently, Symantec offers unique incremental updates, which download only the changes in signature files rather than the entire, time-consuming database. ►

## TIPS FROM THE REAL WORLD

**Larry Bridwell**, product development manager at the International Computer Security Association, does research on viruses and anti-virus products. His advice:

- Be wary of e-mail attachments. If you're unfamiliar with the sender, don't execute them at all.
- If you download executable files from the Internet, Usenet newsgroups, or FTP sites, scan them in a safe area before executing.
- Keep your corporate policies up-to-date. Educate employees about virus dangers.
- Update your antivirus utility's signatures frequently—at least once a month.





The Internet allows you to talk to people in Germany,  
Russia, China and now, even customer support.



EASY SET-UP, INCREDIBLY  
FAST CONNECTIONS, KILLER  
24-HR. SUPPORT AND FLEXIBLE  
PRICING FROM \$6.95/MO.  
INCLUDING \$19.95/MO. FOR  
UNLIMITED ACCESS. WE ALSO  
OFFER BIG PREPAYMENT  
DISCOUNTS. OUR INTERNET  
SERVICES WERE DESIGNED  
WITH YOU IN MIND.



**MindSpring**  
INTERNET SERVICES



[www.mindspring.com](http://www.mindspring.com)

Call now 1-888-MSPRING

Circle 57 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



One minor gripe: You get one year of free updates with NAV, after which you pay \$4 a year. Though this cost isn't wallet-busting—and you'll probably want to upgrade to a new version after a year anyway—it's a nickel-and-dime way to do business.

### PANDA ANTIVIRUS 6.005 PLATINUM

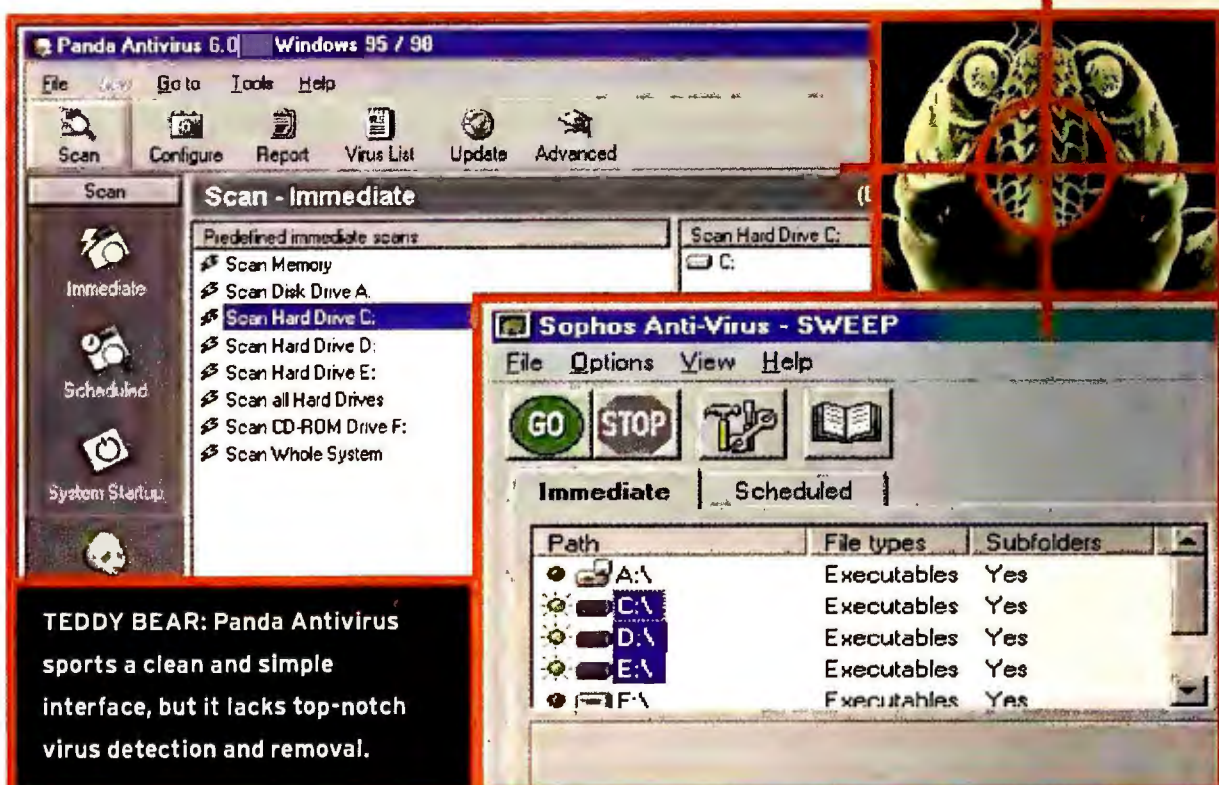
**PRO:** Clean user interface, faster than any other package, easy to update

**CON:** Had problems detecting macro viruses, produced many false positives

ONE OF THE LEADING antivirus packages in Europe but new to the United States, Panda Antivirus fell behind the major domestic packages in our tests. Though the latest version of the product (6.005 Platinum) found every wild boot, file, and polymorphic virus, it detected only 94.1 percent of wild macro viruses, 81.3 percent of zoo file viruses, and 75.5 percent of zoo macro viruses—compared to zoo catch rates in the upper 90s (and 100 percent, or close to it, on wild macro viruses) for all the other packages. It also produced 19 false positives, far more than any other product we looked at. The company says it is working to improve the product's performance in connection with false positives and zoo viruses, and it will post a fix for the macro virus detection problem on its Web site by the time you read this.

On the plus side, Panda works quickly: Its scan time of just over 7 minutes was faster than that of any other product.

Panda Antivirus runs hot and cold in other



**TEDDY BEAR:** Panda Antivirus sports a clean and simple interface, but it lacks top-notch virus detection and removal.

**OPEN YOUR WALLET:** The unadorned interface of Sophos Anti-Virus makes finding infections simple, but its \$99 price doesn't cover any future updates you may need.

ways, too. Its well-designed interface features big, bright status screens that show you what it's doing at all times.

Unlike any other product, it scans at Internet protocol levels such as POP and HTTP, giving you extra protection. The company also provides all-hours toll-free support and free updates for the life of the product, and the simple updating procedure takes just the click of a button. But we found the main scanning screen confusing: It took us quite a while, for example, to figure out how to get the product to examine particular drives.

### SOPHOS ANTI-VIRUS 3.13

**PRO:** Excellent virus detection, versatile scheduler, well-designed interface

**CON:** Expensive, complicated virus repair

SOPHOS CARRIES an excellent reputation for supplying antivirus software to large networked installations. But as a stand-alone product, Sophos Anti-Virus 3.13 proves a poor choice. Despite its high price of \$99—twice the competition's going rate—you get no updates. A version that does supply a single year of updates costs an outrageous \$249.

Sophos does a near-perfect job detecting both wild and zoo viruses, qualifying it as a top-notch performer in these areas. But when it comes to making repairs, the package is far less impressive: The company believes that you should never attempt to repair a file that's infected with a file virus (a belief few antivirus researchers share). As a result, Sophos Anti-Virus offers users only two corrective options: renaming the file (which makes it unreadable but stops the infection) or deleting it. In addition, Sophos's recovery from the boot sector virus AntiEXE was ugly, slow, and ultimately unsuccessful. After 45 minutes of complicated futzing, the product told us we had a virus—but it didn't offer any further instructions. The company says it is reviewing this problem. ►

### TIPS FROM THE REAL WORLD

**Businessman** David Allison, an inveterate computer tinkerer and "resident computer guru" for the Petal, Mississippi, Chamber of Commerce, reports that he's tried virtually every major antivirus program. He insists, "I've seen the cost of viruses and I don't want to pay it." His straightforward approach:

- Use common sense. You don't have to be careless because other people are.

- If you don't know the sender of an e-mail attachment, don't open it. Delete it right away.

- Immediately after you perform a full-system virus scan, make a full backup.

- Always scan a floppy disk as soon as you put it in the drive. If you find a virus, tell the person who gave you the disk.

- Be especially cautious about downloading files from newsgroups.



medicine





## "Best business accelerator"

Matrox Millennium G200

**Millennium G200**  
Best mainstream  
business accelerator  
December 1998



Whether you're looking to upgrade your current PC with a Matrox video card or to purchase Matrox as an integrated component in today's advanced, next generation PCs, you're guaranteed award-winning performance at a new, low price.

**Compaq Desktop EN 450**  
Model 6450X/1400/CDS  
with Millennium G200 SD  
Best high end corporate PC  
December 1998



## "Best high end corporate PCs"

Compaq Deskpro EN 450 and HP Vectra VL Series 8 HE

With over 450 international awards under our belt, we know what it takes to make your 2D, 3D and DVD graphics come alive. It's a blend of superior speed and visual quality. The most reliable, unified drivers. And a comprehensive upgrade path including digital Flat Panel.

**Vectra VL Series 8 HE**  
with MGA-G200  
Best high end corporate PC  
October 1998



## "Best mainstream corporate PC"

HP Vectra VE Series 8

Choose between Matrox's standard 2D, 3D and DVD support with the Millennium G200 series, our 'PC to TV' bonus feature with the Mystique G200, or the 'Swiss Army knife' support for multimedia connectivity and video editing with the Marvel G200-TV.

**HP Vectra VE Series 8**  
with Productiva G100  
Best mainstream corporate PC  
December 1998



**Make Matrox the standard for your business or home PC.**

► Visit our web site at [www.matrox.com/mga](http://www.matrox.com/mga) or call 1-800-362-9343

### 2D performance

**Millennium G200 8MB AGP 135**  
WinBench 99 Business at 1280x1024x24bpp@75Hz

### 3D performance

**Millennium G200 8MB AGP 368**  
3D WinBench 99 at 1024x768x16bpp@85Hz



The tests were performed without independent verification by Ziff-Davis. Ziff-Davis makes no representations or warranties as to the result of the tests. WinBench, 3D WinBench and WinMark are trademarks of Ziff-Davis in the US and other countries. All tests performed with Windows 99 on an Intel 440BX mobile board configured with a 400MHz Pentium III and 128MB of 100MHz SDRAM. WinBench 99 Business run at 1280x1024x24bpp@75Hz refresh. 3D WinBench 99 run at 1024x768x16bpp@85Hz refresh. All tests performed on a Matrox Millennium G200 configured with 8MB of SDRAM for the AGP bus and using driver version 4.30.

# matrox



## INDEFENSE

## An Antivirus Utility With a Difference

BECAUSE IT'S A UNIQUE ANIMAL in the antivirus menagerie, we couldn't test Tegam International's InDefense like the other antivirus utilities. The product never needs virus signature updates—but even so, we can't recommend InDefense as your only line of defense.

InDefense builds on old techniques to protect your system against viruses. First it "vaccinates" all executable files on your PC, taking a snapshot of the file elements. This older technique is particularly good at detecting file viruses; since executable files shouldn't change, any modification is a strong symptom of infection. InDefense also looks for viral activity—a program's attempt to reproduce itself.

But InDefense has a catch-22. It assumes that you have a virus-free system before you install it, which is not always the case, even with a new PC. To use InDefense on any system you weren't sure was clean, you'd first have to run a scan with another antivirus utility.

**Caution: Live Virus Tests.** Because InDefense isn't a scanner, we couldn't use it to scan our system for viruses. Instead, we installed InDefense, activated a suite of live viruses, and then ran the program. InDefense stopped all 15 wild boot, macro, and file viruses we used. But unlike

other antivirus programs, the package assumes a high level of user knowledge, and often asks you to decide whether you've got a problem. For example, during our tests, one warning message read, 'If you know that the partition sector of your hard disk has been changed for normal reasons (i.e. OS upgrading), then press [A]. If it is due to a virus, press [R].' In dealing with macro viruses, InDefense presumes that all "uncertified" macros are viral and that all certified macros are clean, but this isn't always so. (You can certify specific macros that you've created yourself or that you otherwise know are safe; companies such as Microsoft also certify macros.) Though InDefense's interface is fairly straightforward, its dialog boxes and manual are almost impenetrable, written in a combination of technical jargon, marketing-speak, and bad grammar.

**Not the Solution.** Though we recognize that current scanning-style antivirus products aren't perfect and that they necessitate an endless parade of updates, we remain uncon-

vinced that InDefense offers enough protection for the average desktop computer.

## TREND PC-CILLIN 6

**PRO:** Great interface, strong features, low price

**CON:** Prerelease version had trouble repairing a particular boot virus

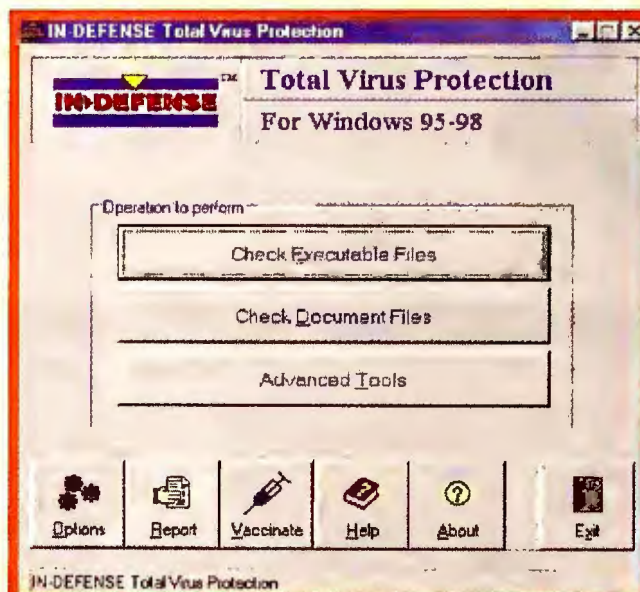
EVEN IN ITS PRERELEASE state, PC-cillin's latest revision impressed us. Version 6 presents a clean, usable interface; several handy features; a competitive price (\$40 for a hard copy, \$30 for the download), and near-perfect virus detection. The only testing problem we saw was the program's failure during repair of a wild boot virus: The real-time monitor detected

the virus but offered no repair option, and a manual scan found no virus at all. Trend Micro sent a patch that fixed the problem; the fix will be included in the final version, due to reach store shelves in mid-January.

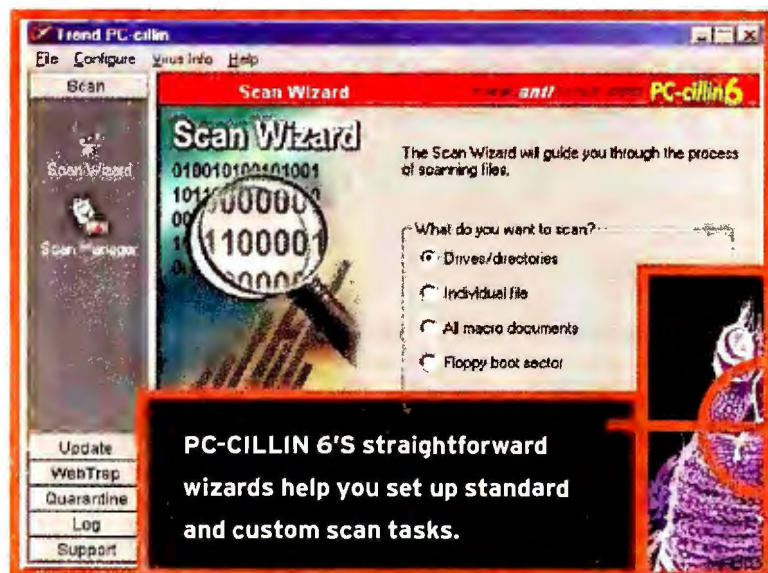
PC-cillin is packed with useful features. It's the only package we've seen that includes a wizard for setting up custom scan tasks, and the only one that uses Internet Explorer 4.0's Active Desktop for virus information. (Alternatively, you can obtain updates via the straight-

forward Update Now or Update Later buttons, or you can instruct the program to check for updates regularly at a preset time, such as 10 minutes after you start your system.) Like McAfee VirusScan, PC-cillin protects against destructive applets and blocks access to unwanted Web sites; like Norton, it offers a quarantine feature that shunts infected files into a protected and isolated area from which the infection can't spread. All this is especially impressive when you consider that the downloaded version of PC-cillin is the cheapest product here.

Stan Miastkowski is a contributing editor for PC World. Testing was performed by Joe Wells at Wells Research.



**NO UPDATE NEEDED:**  
InDefense doesn't require virus signature updates, but it does need a clean PC before installation. You'll have to run a different antivirus product in order to confirm your system's health at the outset.



**PC-CILLIN 6'S straightforward wizards help you set up standard and custom scan tasks.**





**WHO DO YOU DO IT FOR?**



Winner takes all.  
**New Rules. New Tools.**<sup>™</sup>







**Free Tuition!**  
**Micron University is**  
**our gift to you - the**  
**gift of knowledge.**

### WE'RE BUILDING POWERFUL USERS.

1. At Micron, we invest in you: buy any new Micron system and you're automatically enrolled in Micron U. You'll have access to hundreds of free<sup>1</sup> online courses, seminars and tutorials for one full year on the hottest topics in computing, software and business today. Log in from any computer, 24 hours a day, 7 days a week. It's that easy.

### MICRON U - HERE'S HOW IT WORKS.

2. Micron University offers two ways to learn: either with others in online, instructor-led classes, or on your own, at your own pace, with our self-study tutorials. Both offer comprehensive and flexible ways to become a more powerful PC user and better apply technology to your life.

# THE FIRST 450MHz DESKTOP WITH A POST-GRADUATE DEGREE.

Be Smart.

Micron doesn't seem to think  
budget-class buyers should  
be excluded from the new CPU  
lineup. So the company is  
offering its new, sleekly designed  
Millennia 450 at an impressively  
low price... I was knocked out by  
Millennia 450's performance."

PC World Magazine, August '98

Pay Less.

Get More.

Micron University is a great  
idea. I have been able to learn  
things I knew were somewhere  
on the Web, but couldn't find.  
It's also available to me  
whenever I want."

Micron University freshman.

Get Ahead.

### The Critics Rave



Millennia MAX 400  
#1 Power Desktop  
Dec '98



Millennia MAX 400  
#1 Gaming System  
Dec '98



Millennia MAX 450  
Best Buy  
Nov '98



Millennia 400 DVD  
Sept '98  
Oct '98



Millennia 350  
Sept '98  
Oct '98



**MILLENNIA® MAX**  
**BREAKTHROUGH PRICE!**  
**COMPLETE INTERNET-READY<sup>2</sup>**  
**450MHz DESKTOP SYSTEM**

**\$1,999**

- Intel® Pentium® II processor 450MHz
- 128MB 100MHz SDRAM
- 10GB Ultra ATA hard drive\*
- 17" Micron display (15.9" display)
- 6X DVD-ROM drive
- 56K 3Com USR modem\*\*
- Diamond Viper 550 TnT 16MB AGP
- Microsoft® Windows® 98
- Microsoft Office 97 Small Business Edition
- #1 Ranked PC World Power Desktop
- 1-year free<sup>1</sup> tuition to Micron University



## Micron™ Millennia® - The Ultimate Desktop.

Just ranked the #1 450MHz desktop by the editors of CNET and the #1 Power Desktop by the editors of PC World Magazine (Millennia 400 DVD • Oct '98, Millennia MAX 450 • Nov '98, Millennia MAX 400 • Dec '98), Micron's Millennia desktop product line continues a long tradition of industry-leading, award-winning performance. Perhaps that's why some of the most prominent power users around rely on Micron. But Micron offers far more than outstanding systems. We provide the new tools necessary to win in today's demanding new economy, the latest of which is called Micron University and it's absolutely free<sup>1</sup> with the purchase of any new Micron system.

## Exclusive - Micron University - The Ultimate Learning Tool.

In our continuing effort to build not only powerful systems, but powerful users, we are proud to introduce Micron University. Offering hundreds of free<sup>1</sup> online, instructor-led classes, seminars and self-paced tutorials on the hottest topics in computing and business today, Micron University will turn any Micron owner into a highly educated power user. When you combine this powerful new tool with Micron's revolutionary MPower<sup>SM</sup> purchase program, offering qualified users no interest<sup>3</sup> or payments for six months and our PowerXchange trade-in options, you get more than a great machine at a great price, you get a deal you probably won't find anywhere else. Call today to order your system or visit our Web site to find out more about Micron University.

©1999 Micron Electronics, Inc. All Rights reserved. Micron Electronics is not responsible for omissions or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice. Prices do not include shipping and handling and any applicable taxes. 30-day money-back policy does not include return freight and original shipping/handling charges, applies only to Micron brand products, and begins from date of shipment. All sales are controlled by Micron Electronics' current terms and conditions of sale. On-site service is provided at sole discretion of Micron Electronics, Inc. A diagnostic determination for on-site service must be made by a Micron service technician prior to the provision of on-site service. The Intel Inside Logo and Pentium are registered trademarks and Pentium II Xeon, Celeron and MMX are trademarks of Intel Corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. Product names of Micron products are trademarks or registered trademarks of Micron Electronics, Inc. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies. Note: advertised configurations may differ from award-winning configurations. \*One year free with purchase of new Micron desktop and portable systems. \*\*All hard drive sizes calculated with 1GB equal to 1 billion bytes. \*\*\*For all Micron PCs configured with 56Kbps modems. Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and observed transfer rates may be less than the maximum potential. \*\*\*\*Millennia 450 MAX reviewed, PCWorld/November '98. \*\*\*\*\*For all Micron Millennia desktop systems: The CD-ROM drive will be removed upon the purchase of the DVD-ROM drive upgrade. Individuals can qualify for the 6-month same-as-cash program. If purchase advance and related charges are not paid in full within 180 days from the purchase date, finance charges will be assessed from purchase date. The APR varies and is 15.90% as of 11/25/98 with a minimum finance charge of \$1.00. Micron Leasing arranged by an independent entity to qualified commercial customers. Above lease payments based on 36 month, FMV terms and do not include taxes, fees or shipping charges. Leasing subject to credit approval and availability. Above lease terms subject to change without notice or obligation. A non-refundable up-front freight charge applies for participation in PowerXchange to cover cost of return packaging and processing. Contract with outside Internet Service Provider required and is not included. Internet service questions must be resolved by ISP.



## INSTRUCTOR-LED CLASSES.

3. Learning takes place in a virtual classroom, which utilizes a powerful, yet simple to use, threaded message board. Each class is led by industry experts and professional trainers so you know you're being taught by the best. You'll get personalized attention and do it all from the keyboard of your computer - no matter where you are!

## SELF-STUDY TUTORIALS.

4. Learn on your own by following comprehensive tutorials, involving a series of learning exercises. After you master the skills and concepts of each tutorial, you can move on to the next lesson or choose a new topic. You can take tutorials to become a power user on the most popular software applications on the market including Microsoft Office and Windows NT.

# New Rules. New Tools.™

Rock-Solid Reliability. Micron University. MPower™ and PowerXchange™ Programs. Industry-Leading Service and Support.

There's a lot more to owning a system than having a computer sitting on your desk. You'll always want the latest technology, great pricing and service and support

you can count on — and that's exactly what Micron's new MPower program is all about. Call today for details or visit [www.micronpc.com/pcwd](http://www.micronpc.com/pcwd).



## Award-Winning Complete Internet-Ready<sup>3</sup> 450MHz Systems Starting at Just \$1,599



Model Name	Millennia HE 350	Millennia 450	Millennia MAX 450	Millennia MAX 450	New! Millennia MAX 450
Processor	Intel Pentium® II processor 350MHz	Intel Pentium® II processor 450MHz	Intel Pentium II processor 450MHz	Intel Pentium II processor 450MHz	Intel Pentium II processor 450MHz
Cache	512KB internal L2 cache	512KB internal L2 cache	512KB internal L2 cache	512KB internal L2 cache	512KB internal L2 cache
RAM	64MB 100MHz SDRAM	64MB 100MHz SDRAM	128MB 100MHz SDRAM	128MB 100MHz SDRAM	128MB 100MHz SDRAM
Hard Drive	8.4GB Ultra ATA hard drive*	8.4GB Ultra ATA hard drive*	10GB Ultra ATA hard drive*	13.5GB Ultra ATA hard drive*	13.5GB 7200RPM Ultra ATA hard drive*
Monitor	17" Micron 700Vx monitor (15.9" display)	17" Micron 700Vx monitor (15.9" display)	17" Micron 700Vx monitor (15.9" display)	19" Micron 900Lx monitor (18" display)	15" Micron LCD display flat panel
DVD/CD-ROM	32X max speed CD-ROM drive	32X max speed CD-ROM drive	6X DVD-ROM drive (free upgrade from 4.8X DVD-ROM drive)	6X DVD-ROM drive (free upgrade from 4.8X DVD-ROM drive)	6X DVD-ROM drive (free upgrade from 4.8X DVD-ROM drive)
Modem	3Com U.S. Robotics 56K WinModem**	3Com U.S. Robotics 56K WinModem**	3Com U.S. Robotics 56K WinModem**	3Com U.S. Robotics 56K WinModem**	3Com U.S. Robotics 56K WinModem**
Graphics	nVidia Riva 128, 8MB SGRAM 30 2X AGP graphics	nVidia Riva 128, 8MB SGRAM 30 2X AGP graphics	16MB Diamond Viper 550 TnT 2X AGP graphics	16MB Diamond Viper 550 TnT 2X AGP graphics	16MB Diamond Viper 550 TnT 2X AGP graphics
Sound System	PCI 64-voice Wavetable sound	PCI 64-voice Wavetable sound	PCI 128-voice Wavetable sound	PCI 128-voice Wavetable sound	PCI 128-voice Wavetable sound
Speakers	Advent AV009 stereo speakers	Advent AV009 stereo speakers	Advent AV009 stereo speakers	Monsoon MM1000 3-piece flat panel speaker system	Monsoon MM1000 3-piece flat panel speaker system
Warranty	5-year/3-year Micron Power™ limited warranty	5-year/3-year Micron Power limited warranty	5-year/3-year Micron Power limited warranty	5-year/3-year Micron Power limited warranty	5-year/3-year Micron Power limited warranty
Scholarship	1-year free <sup>1</sup> tuition to Micron U online	1-year free <sup>1</sup> tuition to Micron U online	1-year free <sup>1</sup> tuition to Micron U online	1-year free <sup>1</sup> tuition to Micron U online	1-year free <sup>1</sup> tuition to Micron U online
Software Included	Microsoft® Windows® 98 Microsoft Home Essentials Microsoft Power Pak Norton AntiVirus	Microsoft Windows 98 Microsoft Home Essentials Microsoft Power Pak Norton AntiVirus	Microsoft Windows 98 Microsoft Office 97 Small Business Edition Norton AntiVirus	Microsoft Windows 98 Microsoft Office 97 Small Business Edition Norton AntiVirus	Microsoft Windows 98 Microsoft Office 97 Small Business Edition Norton AntiVirus
Also Includes:	New MicroTower™ case 104-key enhanced keyboard Microsoft IntelliMouse <sup>3</sup> 3.5" floppy drive	New MicroTower case 104-key enhanced keyboard Microsoft IntelliMouse 3.5" floppy drive	New MicroTower case Multifunction keyboard Microsoft IntelliMouse 3.5" floppy drive	100MB Iomega Zip drive Micron MiniTower case Multifunction keyboard Microsoft IntelliMouse 3.5" floppy drive	100MB Iomega Zip drive Micron MiniTower case Multifunction keyboard Microsoft IntelliMouse 3.5" floppy drive
Price	<b>\$1,399</b> \$49/mo. Business Lease 36 mos.**	<b>\$1,599</b> \$56/mo. Business Lease 36 mos.**	<b>\$1,999</b> \$70/mo. Business Lease 36 mos.**	<b>\$2,499</b> \$87/mo. Business Lease 36 mos.**	<b>\$2,999</b> \$105/mo. Business Lease 36 mos.**
Order Code:	50008	50003	40010	40009	40011
Upgrade to:	Upgrade to: 4.8X DVD-ROM drive 128MB SDRAM 13.5GB Ultra ATA hard drive Advent subwoofer	Upgrade to: 4.8X DVD-ROM drive 128MB SDRAM 13.5GB Ultra ATA hard drive Advent subwoofer	Upgrade to: 100MB Iomega Zip drive 14.4GB 7200RPM Ultra ATA hard drive	Upgrade to: 348MB SDRAM 14.4GB 7200RPM Ultra ATA hard drive 21" Hitachi monitor (19.8" display)	Upgrade to: 256MB 100MHz SDRAM 14.4GB 7200RPM Ultra ATA hard drive
Price	<b>\$1,757</b> \$63/mo. Business Lease 36 mos.**	<b>\$1,957</b> \$70/mo. Business Lease 36 mos.**	<b>\$2,267</b> \$80/mo. Business Lease 36 mos.**	<b>\$3,549</b> \$115/mo. Business Lease 36 mos.**	<b>\$3,429</b> \$120/mo. Business Lease 36 mos.**
Order Code:	50014	50005	40015	40012	40016



# ORDER DIRECT 1-800-287-3268

Call toll-free or order online at [www.micronpc.com/pcwd](http://www.micronpc.com/pcwd)

Circle 142 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)





## HELP FOR THE MOBILE WORKAHOLIC

When using TREK<sup>2</sup> on the plane, try not to laugh when the 14.1 inch monitor dwarfs the guy's next to you. It's just not a very nice thing to do.

Pack light — there's nothing worse than a carry-on that leaves divots in your shoulder, which is why the TREK<sup>2</sup> is as thin as 1.7".

Avoid the isolation induced by the single-personal mini-soaps of the hotel room by connecting with an optional 56K modem.\*

# IT'S ALMOST SILLY TO CALL A 300MHz NOTEBOOK WITH DVD, AGP GRAPHICS AND A 14.1" DISPLAY A "BUDGET PORTABLE."

### TREK<sup>2</sup>

**TREK<sup>2</sup> 300**  
The Ultimate Desktop Replacement  
**\$2,999**

- Intel® Pentium® II processor 300MHz
- 128MB SDRAM
- 3.2GB hard drive (removable)\*
- 14.1" XGA TFT display
- DVD-ROM II drive
- 4MB AGP graphics
- 3.5" floppy drive (dedicated bay)
- Microsoft® Windows® 98
- Microsoft Office 97 Small Business Edition
- 1-year free<sup>§</sup> tuition to Micron U online.



## PENTIUM® II PROCESSOR POWER, AGP GRAPHICS, DVD AND A 14.1" DISPLAY AT BREAKTHROUGH PRICING

Experts and industry pundits agree that Micron makes some of the world's best notebooks. Our product lines have won the coveted *PC Magazine* Editors' Choice award along with a myriad of other prestigious awards. And the new TransPort® TREK<sup>2</sup>™ is no exception. *PC World* ranked the new TransPort TREK<sup>2</sup> the #1 budget notebook available today<sup>†</sup>. And with a Pentium II processor 300MHz, AGP graphics, 1-year free<sup>§</sup> tuition to Micron U, optional DVD and a gigantic 14.1" display, the TransPort TREK<sup>2</sup> is one of the best desktop replacements you can buy. Call Micron today and get a TransPort TREK<sup>2</sup> custom configured to your specific needs direct from the factory at unbelievably low prices.

### Micron University - The Ultimate Learning Tool

In our continuing effort to build not only powerful systems, but powerful users, we are proud to introduce Micron University. Offering over one hundred free<sup>§</sup> online classes, seminars and self-paced tutorials on the hottest topics in computing and business today, Micron University will turn any Micron owner into a highly educated power-user. When you combine this powerful new tool with Micron's revolutionary MPower<sup>SM</sup> purchase program, offering qualified users no interest,<sup>‡‡</sup> no payments for six months and our PowerXchange trade-in options, you get more than a great machine at a great price, you get a deal you probably won't find anywhere else. Call today to order your system and to find out more about Micron University.

**"The TransPort TREK  
is the Fastest Budget  
Notebook We've Run  
Through Our Mill."<sup>††</sup>  
—PC World, Ranked #1,  
"Best Buy," April '98**

**AMY ALCORN, MD**  
Pediatrician  
System: Micron TransPort TREK  
Favorite Feature: Brilliant Display  
Purpose: Online Medical Research  
For The Whole Story: [www.micronpc.com](http://www.micronpc.com)

**BOB PARKER**  
Owner/Founder Parker Motor Sports  
Dominant Indy Race Car Team  
Systems: Micron TransPort TREK Notebooks/  
Millennia Desktops  
Favorite Feature: Speed — Of Course!  
Purpose: Telemetry between Indy Car and Pit Crew  
For The Whole Story: [www.micronpc.com](http://www.micronpc.com)

©1999 Micron Electronics, Inc. All Rights reserved. Micron Electronics is not responsible for omissions or errors in typography or photography. All purchases are subject to Micron Electronics' current terms and conditions of sale. Prices and specifications may be changed without notice, prices do not include shipping and handling and any applicable taxes. A 30-day money-back policy (does not include return freight and original shipping/handling charges, applies only to Micron brand products and begins from date of shipment. All sales are controlled by Micron Electronics' current terms and conditions of sale. On-site service is provided at sole discretion of Micron Electronics, Inc. A diagnostic determination for on-site service must be made by a Micron service technician prior to the provision of on-site service. The Intel Inside Logo and Pentium are registered trademarks and Pentium II Xeon, Celeron and MMX are trademarks of Intel Corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. Product names of Micron products are trademarks or registered trademarks of Micron Electronics, Inc. Other product names used in this publication are for identification purposes only and may be trademarks of their respective owners. Note: advertised configurations may differ from award-winning configurations. \*All hard drive sizes calculated with 1GB equal to 1 billion bytes. †The TransPort TREK 166MHz system was ranked #1 by PC World. At the time of ranking, the system was code-named "Micron Mandarin". ††System Wizard not available with Windows NT. †††For all Micron PCs configured with 56Kbps modems: Maximum transmission speed of up to 56Kbps when downloading data and 33.6Kbps when uploading. However, actual performance is dependent upon numerous factors and observed transfer rates may be less than potential. ‡One year free tuition to Micron U with purchase of new Micron desktop and portable systems. ‡‡Individuals can qualify for the 6-month same-as-cash program. If purchase advance and related charges are not paid in full within 180 days from the purchase date, finance charges will be assessed from purchase date. APR varies and is 16.90% as of 1/25/98 with a minimum finance charge of \$1.00. §Micron Leasing arranged by an independent entity to qualified commercial customers. Above lease payments based on 36 month, FMV terms and do not include taxes, fees or shipping charges. Leasing subject to credit approval. Availability: Above lease terms subject to change without notice or obligation. A non-refundable up-front freight charge applies for participation in PowerXchange to cover cost of return packaging and processing.



# Clients Don't Come To You

2

VOL. 1 SEC. 05  
99 2

Work hard, but leave time for some major goofing off. And with a DVD-ROM drive and 3.5" floppy included, whether it's games, movies or work, you'll have access to it all.

Don't be afraid to hug your notebook. Sometimes, nothing is more comforting to the weary road warrior than 300MHz of mobile desktop-replacing power.

The world is a book,  
and those who do not  
travel, read only a page.  
—William Shakespeare



TREK² 233



TREK² 233



TREK² 266



**New!**  
TREK² 300

Now Featuring  
Brilliant 14.1" Display!  
DVD-ROM II drive!

Model Name	TREK² 233	TREK² 233	TREK² 266	TREK² 300
Processor	Intel® Pentium® II processor 233MHz	Intel Pentium II processor 233MHz	Intel Pentium II processor 266MHz	Intel Pentium II processor 300MHz
Cache	512KB L2 pipeline burst cache	512KB L2 pipeline burst cache	512KB L2 pipeline burst cache	512KB L2 pipeline burst cache
RAM	32MB EDO DRAM	64MB SDRAM	64MB SDRAM	128MB SDRAM
Hard Drive	3.2GB hard drive (removable)*	3.2GB hard drive (removable)*	3.2GB hard drive (removable)*	3.2GB hard drive (removable)*
Monitor	12.1" SVGA TFT display	13.3" XGA TFT display	14.1" XGA TFT display	14.1" XGA TFT display
Extra Storage	3.5" floppy disk drive (dedicated bay)	3.5" floppy disk drive (dedicated bay)	3.5" floppy disk drive (dedicated bay)	3.5" floppy disk drive (dedicated bay)
DVD/CD-ROM	24X CD-ROM drive (dedicated bay)	24X CD-ROM drive (dedicated bay)	24X CD-ROM drive (dedicated bay)	DVD-ROM II drive (dedicated bay)
Graphics	4MB AGP graphics accelerator	4MB AGP graphics accelerator	4MB AGP graphics accelerator	4MB AGP graphics accelerator
Sound System	Built-in stereo speakers & microphone	Built-in stereo speakers & microphone	Built-in stereo speakers & microphone	Built-in stereo speakers & microphone
Warranty	5-year/1-year Micron limited warranty	5-year/1-year Micron limited warranty	5-year/1-year Micron limited warranty	5-year/1-year Micron limited warranty
Software Included	Microsoft® Windows® 98 System Wizard Mobile Client™ Norton AntiVirus	Microsoft Windows 98 Microsoft Office Small Business Edition System Wizard Mobile Client™ Norton AntiVirus	Microsoft Windows 98 Microsoft Office Small Business Edition System Wizard Mobile Client™ Norton AntiVirus	Microsoft Windows 98 Microsoft Office Small Business Edition System Wizard Mobile Client™ Norton AntiVirus
Scholarship:	1-year free* tuition to Micron U Online	1-year free* tuition to Micron U Online	1-year free* tuition to Micron U Online	1-year free* tuition to Micron U Online
Also Includes:	Zoomed Video capable Li-Ion battery (dedicated bay) Microphone, stereo line-in/out jacks Touchpad pointing device CardBus ready S-Video & NTSC out; MPEG compatible Wavetable/3D Positional Sound 2-way fast infrared port 2 Type II/1 Type III PCMCIA slots 2-USB, parallel, serial, VGA, PS/2 ports	Zoomed Video capable Li-Ion battery (dedicated bay) Microphone, stereo line-in/out jacks Touchpad pointing device CardBus ready S-Video & NTSC out; MPEG compatible Wavetable/3D Positional Sound 2-way fast infrared port 2 Type II/1 Type III PCMCIA slots 2-USB, parallel, serial, VGA, PS/2 ports	Zoomed Video capable Li-Ion battery (dedicated bay) Microphone, stereo line-in/out jacks Touchpad pointing device CardBus ready S-Video & NTSC out; MPEG compatible Wavetable/3D Positional Sound 2-way fast infrared port 2 Type II/1 Type III PCMCIA slots 2-USB, parallel, serial, VGA, PS/2 ports	Zoomed Video capable Li-Ion battery (dedicated bay) Microphone, stereo line-in/out jacks Touchpad pointing device CardBus ready S-Video & NTSC out; MPEG compatible Wavetable/3D Positional Sound 2-way fast infrared port 2 Type II/1 Type III PCMCIA slots 2-USB, parallel, serial, VGA, PS/2 ports
Price	<b>\$1,699</b> \$59/mo. Business. Lease 36 mos.**	<b>\$2,099</b> \$73/mo. Business. Lease 36 mos.**	<b>\$2,299</b> \$80/mo. Business. Lease 36 mos.**	<b>\$2,999</b> \$105/mo. Business. Lease 36 mos.**
Order Code:	20005	20008	20009	20010

## New Rules. New Tools.™



Micron™ notebooks are among the very best available. Our notebooks have been critically acclaimed by industry pundits and power users alike. And the TransPort TREK² is no exception. Call Micron today and order any of our award-winning notebooks custom configured to meet your specific needs.



### ORDER DIRECT 1-800-287-3268

Call toll-free or order online at [www.micronpc.com/pcwd](http://www.micronpc.com/pcwd)

Circle 145 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)





## PUT THE POWER OF WINDOWS NT TECHNOLOGIES TO WORK FOR YOU.

### OPTIMIZED FOR WINDOWS NT

1. As the first direct PC manufacturer to ship Windows NT back in '94, Micron's knowledge and experience can help you maximize your Windows NT network, now and into the future.

### HIGH-PERFORMANCE, RELIABLE NETWORKING

2. The Micron ClientPro desktop and NetFRAME server utilize industry-standard technology and are powered by Intel's latest chip set technology, including the Intel Pentium II and Pentium II Xeon™ processors.

# MICRON MAKES IT EASY TO HARNESS THE POWER OF MICROSOFT WINDOWS 2000

#### CRITICS RAVE ABOUT THE MICRON CLIENTPRO

"The Micron ClientPro 400 succeeds in providing an optimized LANdesk Management Solution and combines it with top performance at a good price."

— PC Magazine  
June 30, 1998

"Micron ClientPro provides 'gracious plenty' for corporate IS and small-business buyers alike...This Windows NT 4.0 workhorse comes ready to network, with a preinstalled 3Com Etherlink LAN adapter card and Intel's remote control software for system monitoring."

— PC World  
November 1998

**A**s the industry looks ahead to Microsoft Windows 2000 (built on NT technology), Micron offers a way to get ahead of the game today. Whether you're looking to upgrade to Windows NT® 4.0 or preparing for a company-wide shift to Windows 2000, our ClientPro® managed PCs and Micron™ NetFRAME® servers will be among the first to support the full potential of Microsoft Windows 2000. Network-ready right out of the box, built on industry standards, and packing the power of the Intel® Pentium® II processor 450MHz, the ClientPro puts more manageable power in your office. And if you're looking for a reliable and expandable server, it would be tough to beat Micron's NetFRAME servers running with the powerful new Intel Pentium II Xeon™ processor. Nothing maximizes a network today and tomorrow like Windows NT technology – and no one delivers it better than Micron. And as the first PC company to ship Microsoft Windows NT in 1994, it's no surprise that Micron's **AdvanceDeploy** program gives Micron users early access to Windows 2000.

#### "MICRON'S NETFRAME 3100 GIVES YOUR WEB CUSTOMERS WHAT THEY WANT BEFORE THEY CLICK AWAY."

— PC Computing, A-List Best Web Server, Nov. '98

#### "MICRON'S DUAL-PROCESSOR... SERVER RUNS FULL SPEED AHEAD."

— PC Computing, A-List Editors' Choice



So when you're ready to put the power of the ultimate business operating system into your office network, look to the experience and affordability of Micron ClientPro managed PCs and Micron NetFRAME servers. Call today for more information or to order direct from the factory or visit [www.micronpc.com/pcwd](http://www.micronpc.com/pcwd).

### Micron University - The Ultimate Learning Tool

In our continuing effort to build not only powerful systems, but powerful users, we are proud to introduce Micron University. Offering over one hundred free<sup>5</sup> online classes, seminars and self-paced tutorials on the hottest topics in computing and business today, Micron University will turn any Micron owner into a highly educated power-user. When you combine this powerful new tool with Micron's revolutionary MPower<sup>SM</sup> purchase program, offering qualified users no interest,<sup>\*\*\*</sup> no payments for six months and our PowerXchange trade-in options, you get more than a great machine at a great price, you get a deal you probably won't find anywhere else. Call today to order your system and to find out more about Micron University.

Micron NetFRAME 6200



©1999 Micron Electronics, Inc. All Rights reserved. Micron Electronics is not responsible for omissions or errors in typography or photography. All purchases are subject to availability. Prices and specifications may be changed without notice, prices do not include shipping and handling. Today's computers are fast, but they are also expensive. Micron's AdvanceDeploy program offers a unique way to get the most out of your investment. A diagnostic determination for on-site service must be made by a Micron service technician prior to the provision of on-site service. The Intel Inside Logo and Pentium are registered trademarks and Pentium II Xeon, Celeron and MMX are trademarks of Intel Corporation. Microsoft, Windows, Windows NT and the Windows logo are registered trademarks of Microsoft Corporation. Product names of Micron products are trademarks or registered trademarks of Micron Electronics, Inc. Other product names used in this publication are for identification purposes only and may be trademarks of their respective companies. Note: advertised configurations may differ from award-winning configurations. \*All hard drive sizes calculated with 1GB equal to 1 billion bytes. †ClientPro 400 reviewed, PC Magazine, June 30 1998. ††On-site service for NetFRAME servers is provided by an independent service provider and is only available in the United States. ‡One year free with purchase of new Micron systems. ††† Individuals can qualify for the 6-month same-as-cash program. If purchase advance and related charges are not paid in full within 90 days from the purchase date, finance charges will be assessed from purchase date. The APR varies and is 16.90% as of 11/25/98 with a minimum finance charge of \$1.00. Micron Leasing arranged by an independent entity to qualified commercial customers. Above lease payments based on 36 month, FMV terms and do not include taxes, fees or shipping charges. Leasing subject to credit approval and availability. Above lease terms subject to change without notice or obligation.



## PLANNED TECHNOLOGY MIGRATION

## HIGHLY MANAGED

- 3.** To simplify technology planning and implementation, Micron designs all ClientPro and NetFRAME systems to have long model lifecycles, consistent components and planned technology transitions including the upcoming industry shift to Microsoft Windows 2000.

- 4.** Based on the Wired for Management specification and Desktop Management Interface compliant, ClientPro can be managed from a single point on the network. And every ClientPro desktop and NetFRAME server is backed by Micron's unmatched service and support programs.



# New Rules. New Tools.™



**ClientPro CS 450**  
The Highest Performing Managed PC†

Intel® Pentium® II processor 450MHz  
512KB internal L2 cache  
128MB 100MHz SDRAM  
8.4GB Ultra ATA hard drive\*  
17" Micron 700Vx (15.9" display)  
32X max speed CD-ROM drive  
8MB Real 3D Starfighter AGP graphics  
64-voice PCI Wavetable sound  
3Com 3C905 WOL 10/100 network card  
5-year/3-year Micron Power™ limited warranty  
1-year free\* tuition to Micron U online

Intel LANDesk® Client Manager  
Microsoft® Windows NT® Workstation 4.0  
Norton AntiVirus

SMART II hard drive monitoring  
Chassis Intrusion detection  
Fan, temperature, and voltage problem reporting  
Virus detection reporting  
Remote Wake Up capability  
MiniTower case  
3.5" floppy drive  
104-key enhanced keyboard  
Microsoft IntelliMouse®

**\$2,049** <sup>\$72/mo.</sup>  
Business Lease.  
36 mos.<sup>10</sup>



**NetFRAME 3101**  
The Perfect Small Business Server

Intel Pentium II processor 400MHz  
512KB internal L2 ECC cache  
128MB ECC 100MHz SDRAM  
4GB Ultra ATA hard drive\*  
32X max speed CD-ROM drive  
5-year/3-year Micron Power limited warranty  
Dedicated server technical support, 7x24  
1-year next-business-day on-site service\*\*\*

1-year free\* tuition to Micron U online

Intel LANDesk Server Manager  
Emergency Management Port Console

Supports up to two Intel Pentium II processors  
100MHz frontside bus and up to 1GB memory support  
Integrated Ultra Wide SCSI-3 dual channel controller  
Intel PRO/100+ Server Adapter  
Integrated RAID upgrade support  
5 expansion slots: 3 PCI, 1 ISA, 1 shared PCI/ISA  
8 drive bays: 1 external 3.5", 2 external 5.25"  
5 hot-swap redundant 1.0" hard drive bays

**\$2,499** <sup>\$87/mo.</sup>  
Business Lease.  
36 mos.<sup>10</sup>



**NetFRAME 6200**  
High-Powered Server For Fast-Growing Businesses

Intel Pentium II Xeon™ processor 450MHz  
512KB integrated L2 ECC cache  
128MB ECC EDO DRAM  
9GB U2W LVDS SCA 1" hard drive\*  
32X 5051 CD-ROM drive  
5-year/3-year Micron Power limited warranty  
Dedicated server technical support, 7x24  
1-year next-business-day on-site service\*\*\*  
NOS support (3 first-year incident resolutions), 7x24

1-year free\* tuition to Micron U online

Intel LANDesk Server Manager 6.0  
Emergency Management Port Console  
Microsoft Windows NT Server 4.0 (10-user license)

Supports up to four Intel Pentium II processors  
Options for 512KB, 1MB or 2MB L2 cache  
Xeon processors  
4GB ECC EDO support (16 DIMM sockets)  
Integrated Ultra-2 Wide LVDS dual channel & Ultra/narrow SCSI controller  
7 expansion slots: 6 PCI, 1 shared ISA/PCI  
6 internal, hot-swappable hard drive bays  
1 hot-swappable 400-watt power supply (upgradable to three w/redundancy)  
3 external 5.25" media bays and floppy drive  
Free-standing pedestal chassis standard (7u rack mount option available)

**\$6,999** <sup>\$226/mo.</sup>  
Business Lease.  
36 mos.<sup>10</sup>



**NetFRAME 9200**  
The Mission-Critical Enterprise Server

Intel Pentium II Xeon processor 450MHz  
512KB internal L2 ECC cache  
256MB ECC EDO DRAM  
2 dedicated 4GB U2W LVDS redundant hot-swappable boot drives  
32X max speed CD-ROM drive  
5-year / 3-year Micron Power limited warranty  
Dedicated server technical support, 7x24  
1-year next-business-day on-site service\*\*\*  
NOS support (first-year 3 incident resolutions)

1-year free\* tuition to Micron U online

Intel LANDesk Server Manager 6.0  
Emergency Management Port Console  
Microsoft NT Server 4.0 (10-user license)

Supports up to four Intel Pentium II processors  
Options for 512KB, 1MB or 2MB L2 cache  
Xeon processors  
8GB ECC EDO support (32 DIMM sockets)  
Intel PRO/100+ Server Adapter w/Adaptive Load Balancing and Adapter Fault Tolerance software  
Integrated Ultra-2 Wide LVDS dual channel controller  
10 expansion slots: 4 hot-plug ready 64-bit PCI slots, Five 32-bit PCI & 1 PCI/ISA slot shared  
2 hot-swappable 750-watt 220-volt power supplies (Upgradable to 3 w/redundancy)  
7u rack mount chassis (cabinet sold separately)

**\$14,199** <sup>\$455/mo.</sup>  
Business Lease.  
36 mos.<sup>10</sup>



**DataFRAME 450**  
The Ultimate Highly Scalable Mass Storage System

Dual/Split SCSI bus disk sub-system w/8 drive bay capacity  
1+1 (2 total) redundant hot-swappable power supplies (300 watts each)  
9GB U2W LVDS SCA-2 hot swappable hard drive\*  
3u height rack mount chassis w/rafs  
3-year Micron Power limited warranty  
Dedicated server technical support, 7x24  
1-year next-business-day on-site service\*\*\*

1-year free\* tuition to Micron U online

Web Storage Manager (environmental monitoring system)  
Supports up to 8 SCA-2 hot swappable hard drives  
Supports 1" or 1.6" hard drive heights  
Maximum storage capacity: 144GB per enclosure  
Ultra-2 Wide 80MBps transfer rate  
Low Voltage Differential SCSI Interface (12 meter cable length)  
Optional deskside/pedestal version available

**\$2,899** <sup>\$101/mo.</sup>  
Business Lease.  
36 mos.<sup>10</sup>

## THERE'S NO BETTER TIME TO TRANSITION TO WINDOWS NT® TECHNOLOGY.



Micron systems, equipped with the easy to operate Microsoft Windows NT Workstation 4.0 operating system, allow your business to achieve immediate improvements in productivity. The power of a Micron system running Microsoft Windows NT offer the greatest return on investment and ensures that you own the best upgrade path to future technology such as Microsoft Windows 2000.



# ORDER DIRECT 1-800-287-3268

Call toll-free or order online at [www.micronpc.com/pcwd](http://www.micronpc.com/pcwd)

Circle 149 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# ViewSonic's family just got bigger.

## From ultra light to ultra bright.



PjL802



PJ820



PJ1000

From our perfectly portable ViewBook™ to our breathtakingly brilliant Office Theater™ projectors, you get everything you need.

If presentations are important to you, the most important name you need to know is ViewSonic.\* Our family of 3-panel active matrix LCD projectors is growing by leaps and lumens. All you have to do is plug them in and turn them on. No diagrams, no adapters, no sweat.

Our new PjL802 ViewBook projector is an ultra light, 11.0 pound portable that barely tips the scales at all. Yet its maximum brightness and supported resolutions combine to deliver heavyweight-class performance. When you factor in its built-in PC card slot, the new PjL802 becomes the perfect portable for presentations on the go.

When it comes to ultra bright projectors, nothing can match the ANSI lumen brilliance of our two Office Theater projectors, the new PJ820 and the new PJ1000. They're simply brilliant. We are rightfully proud of their dazzling performance. And their portability.

Available wherever you buy ViewSonic monitors.

With ViewSonic's growing family of projectors, you really do get it all. And then some. You get the kind of leading-edge technology and performance you've come to expect from ViewSonic displays. Plus you get the convenience and accessibility of buying the ViewSonic projector you need where you currently buy your computer peripherals.

Come see the new PJ820, PJ1000 and PjL802 LCD projectors for yourself. Then you'll understand why, in our family, you can never be too bright or too light.

**For the dealer nearest you, call ViewSonic at (800) 888-8583 and ask for agent 81258, or visit our website at: [www.viewsonic.com](http://www.viewsonic.com).**

	ViewBook™	Office Theater™		
Model	PjL802	PJ800	PJ820	PJ1000
Brightness*	400	550	750	600
Display Size	20" – 300"	30" – 300"	30" – 300"	21" – 600"
Optimal Resolution	SVGA 800 x 600	SVGA 800 x 600	SVGA 800 x 600	XGA 1,024 x 768
Max. Supported Resolution	1,024 x 768	1,024 x 768	1,024 x 768	1,280 x 1,024

\*Brightness in ANSI lumens may vary up to 10% depending on room lighting and lamp conditions.  
(909) 869-7976 Fax: (909) 869-7958 • Internet: [www.viewsonic.com](http://www.viewsonic.com)  
Specifications subject to change without notice.  
Copyright © 1998, ViewSonic Corporation • All rights reserved.





# DVD for a spin

## taking

**SAY DVD**, and most people think of movies on disc that you rent at your local video store—but this new format means business, too. The same technology that paints the *Titanic* vividly across your TV screen is also surfacing in PCs; one out of five desktop computers that *PC World* receives each month for review has a DVD-ROM drive. And we're finally seeing business software shipping on this high-capacity format.

"The trickle of DVD-based productivity programs will become a steady stream in the next few years," says Dataquest's Mary Bourdon. We found that you can prepare for the influx ►

DVD isn't for everyone. But if you want your PC to be ready for the software of the future and the latest Hollywood blockbuster movies, we'll steer you in the right direction.  
By Michael Goodwin





with little effort or expense. DVD-ROM discs have over seven times the capacity of CD-ROM discs (4.7GB compared to 650MB)—enough space for vendors to include appealing extras like multiple camera angles and language tracks. And based on our tests with real-world applications, the latest DVD-ROM drives play CD-ROM discs with no performance hit. If you install an MPEG-2 decoder (either a PCI board or a software package), you can even watch DVD movies. The cost can be minor: You can upgrade to DVD-ROM for as little as \$50 over the price of a CD-ROM drive.

If you are like many people, you're probably overwhelmed by all the optical options: Should you stick with your CD-ROM drive, or move to a DVD-ROM drive that also read CDs? Should you opt for a writable drive, such as CD-Rewritable or DVD-RAM? If DVD-ROM makes the most sense, should you get a kit with an MPEG-2 decoder card, or one with software decompression? Which kit is the best?

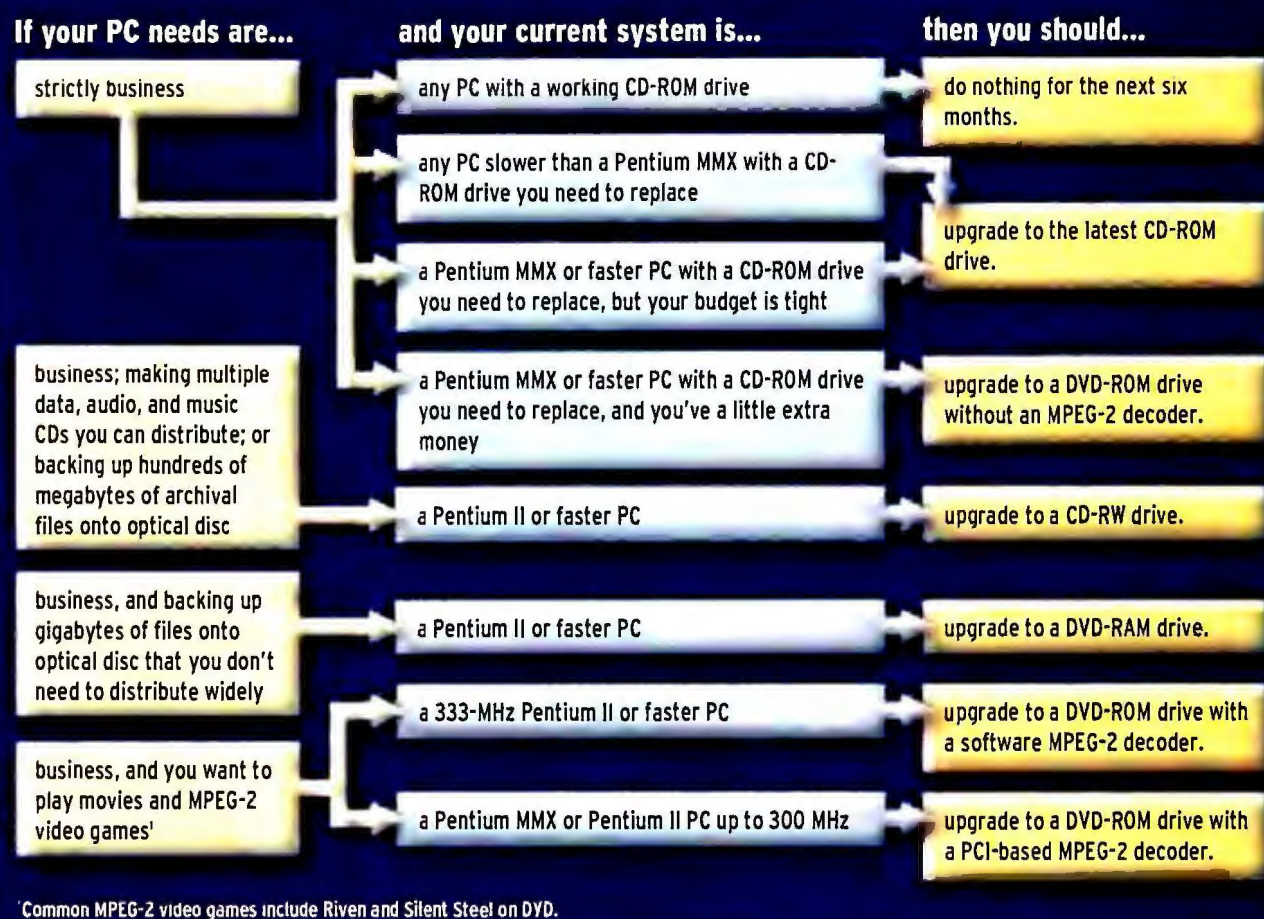
We speed-tested the bare DVD-ROM drives from Creative Labs, Hitachi, Sony, and Toshiba (prices range from \$102 to \$135). We also installed and tested DVD-

ROM kits (which include a DVD-ROM drive plus an MPEG-2 decoder board) from Creative Labs (\$250), Hi-Val (\$279), Newcom (\$229), Pacific Digital (\$229), and Sony (\$349). Finally, to compare DVD per-

a home-office magnate with a lust for the latest technology, or even just someone who might be interested in watching DVD movies on the computer.

Tempting as the upgrade may sound,

## Picking the Right Optical Drive: Bye-Bye CD-ROM?



<sup>1</sup>Common MPEG-2 video games include Riven and Silent Steel on DVD.

formance with that of another popular optical format, CD-RW, we tested Hewlett-Packard's CD-Writer Plus 8110i.

### DECISIONS, DECISIONS

DVD-ROM MAKES good sense if you're a business user who wants to be ready for the next generation of DVD-savvy software,

though, it's not for everyone. Despite reports of CD-ROM's imminent demise, many people will be perfectly content sticking with that venerable format. Very few business titles are available on DVD; at press time, we found only three: Phone-Disc's PowerFinder, a nationwide phone directory; DeLorme's AAA Map'n'Go, a

## DVD-ROM DRIVE KITS

## FEATURES COMPARISON

	PRODUCT	Street price with hardware decoder (11/20/98) <sup>1</sup>	Street price with software decoder (11/20/98) <sup>1</sup>	Overall rating <sup>2</sup>	Scorecard				
					Performance	Features	Installation	Support quality/policies	Documentation
1	 Sony DDU-220E/H5X DVD-ROM 800/352-7669 www.sony.com	\$349	n/a	best	good	outstanding	very good	very good/good	excellent
2	Creative Labs PC-DVD Encore 5X 800/998-5227 www.soundblaster.com	\$250	n/a	good	very good	satisfactory	good	satisfactory/poor	very good
3	Hi-Val DVD-3 714/953-3000 www.hival.com	\$279	\$149	good	very good	satisfactory	good	satisfactory/satisfactory	poor
4	Newcom Cinema II Plus <sup>5</sup> 800/563-9266 www.newcominc.com	\$229	\$149	good	very good	good	good	satisfactory/poor	excellent
5	Pacific Digital DVD 2X DVD-ROM 818/865-9055 www.pacificdigitalcorp.com	\$229	n/a	poor	very good	limited	poor	satisfactory/poor	excellent



Best Buy ● Yes ○ No  
n/a = not applicable

<sup>1</sup> Average of quotes from several companies listed on www.pricewatch.com.

<sup>2</sup> Based on ease of installation (35 percent), performance (25 percent), price (20 percent), features (10 percent), and support (10 percent).



route-planning program; and Microsoft's Encarta multimedia reference title. Furthermore, if you want to cut your own disks or use your drive for system backups, neither CD-ROM nor DVD-ROM will do; you'll need a writable format such as CD-RW (see "Write On"). Finally, you pay an extra premium for DVD-ROM. You can get a fast CD-ROM drive replacement for \$50; even a bare-bones DVD-ROM drive costs at least \$100.

If you use your PC for business only, and your 4X or faster CD-ROM drive works fine, sit tight—and check DVD-ROM prices again in six months. Ditto if you're buying new PCs in volume (say, ten or more) on a tight budget. But if just a few of the CD-ROM drives in your office fleet need replacement and you have a little extra in the budget, consider DVD-ROM drives without add-ons such as an MPEG-2 decoder, especially if you'll be installing the drives in newer PCs. If you want to play games or watch movies after business hours, and your PCs are equipped with a 333-MHz Pentium II or faster processor, look for DVD-ROM drives with software-based MPEG-2 decoders (\$149 and up).

### MY OFFICE, MY HOME

IF YOU RUN A SMALL OFFICE or home office, DVD-ROM holds even more appeal, especially if your PC doubles as an entertainment station. You might play an occa-



DVD-ROM kits can be an installation

nightmare, so make sure the vendor you buy from offers good support. That's the main reason Sony's DDU-220E/H5X DVD-ROM kit captures our Best Buy, in spite of its hefty \$349 price. Sony offers around-the-clock help, and it's the only company whose support technicians answered our calls right away. This kit also produces near-flawless DVD video and audio output and gives you the best software bundle, which includes Funk & Wagnall's Unabridged Encyclopedia on CD-ROM.

**Best Buy**



sional DVD game while you wait for a late-night fax to arrive, watch a movie on your PC, or even attach a cable to your TV so the family can enjoy the movie (see "Battle For the Boob Tube"). And since you're probably outfitting only one PC, you may not mind paying a little extra for cutting-edge features—especially if you're looking to replace a slow or broken CD-ROM drive.

Once you opt for DVD-ROM, you must figure out whether you need a hardware or a software decoder. If you plan to watch DVD movies on your TV, consider spending the \$229 to \$349 on a DVD-ROM drive kit with an MPEG-2 decoder board. The kit is especially recommended for PCs running at 300 MHz or slower, since effective

software decoding requires a Pentium II chip running at 333 MHz or faster. Also, a decoder board sends sharp images to your TV via a cable; software-only decoders force you to use output from your video card, a setup that often yields poor video quality. But if you've already shot your budget on a fast PC, consider a DVD-ROM drive with a software decoder, particularly if you don't need to display video on your TV.

If a new PC figures in your small- or home-office plans, we suggest spending an extra \$150 to \$300 over the standard CD-ROM configuration to get a DVD-ROM drive and a preinstalled hardware decoder board. You can't usually choose which make of DVD-ROM drive your vendor puts into your PCs, but chances are good you'll get Toshiba's SD-M1202 or Hitachi's GD-2500, both of which performed very well in our tests.

Comments	Features		Support			PC World InfoNet number <sup>4</sup>
	Drive model/ street price <sup>1</sup>	MPEG-2 decoder board	Toll-free support	Weekday support hours	Weekend support hours <sup>2</sup>	
Pricey, but it's easy to install, delivers excellent image and sound quality, and has the best support of the bunch.	Sony DDU220E/ not available	Sigma Designs Hollywood Plus	●	24	48	705
Easy installation, on-screen DVD player works like a TV remote control. But images appear fuzzy in some display modes, and support reps managed to elude us.	Creative DVD5240E/ \$125	Creative Dxr2	○	14	22	706
Excellent image and sound quality, but lacks some installation instructions. We had to leave repeated messages for support.	Toshiba SD-M1202/ \$135	Sigma Designs Hollywood Plus	●	9	5	707
Low-price champ, excellent image and sound quality, easy to install, but support was hard to reach.	Hitachi GD-2000/ \$102	Sigma Designs Hollywood Plus	●	18	18	708
Avoid this kit—at least in its current incarnation. Missing cables and drivers hampered installation, error messages went undocumented, and support proved unhelpful.	Hitachi GD-2500/ \$125	Sigma Designs Ventura II	●	9	none	709

<sup>2</sup> Sum of Saturday and Sunday hours.

<sup>4</sup> For more information about all products in this article, select PC World InfoNet no. 910 or visit [www.pcworld.com/infonet](http://www.pcworld.com/infonet).

<sup>3</sup> Will ship with 5X/24X DVD-ROM drive starting January 1999.



Even if you don't need hardware-based MPEG-2 decoding now, we still recommend paying the extra money if you think you'll *ever* watch movies or play DVD games during the computer's lifetime. Installing these boards yourself can be a harrowing experience.

### AND THE WINNER IS . . .

OF THE FIVE KITS we reviewed, the Sony earns our Best Buy, despite its high \$349 price. It installed without a hitch, ran perfectly, comes with the best software bundle

here, and puts out great video and audio. And Sony delivers the best support of the bunch—a crucial consideration, in light of the setup hassles you may encounter.

That said, the Sony's not the top pick for *all* users. Tech-savvy users on a budget—especially those who don't mind spending time on the phone troubleshooting—should look at the Newcom and Hi-Val kits, too. The \$229 Newcom is one of the lowest-cost kits in the roundup, and Newcom offers a software MPEG-2 decoder as a \$149 alternative to the hardware kit. The \$279 Hi-Val also yields first-class images and sound. On the other hand, Pacific Digital's kit is simply not ready. Until the company upgrades its hardware and support quality, pass it by.

## Anatomy of a DVD-ROM Kit

CHOOSING THE top DVD-ROM drive kit means balancing price, features, performance, ease of installation, and support. Prices vary considerably—from \$229 for the Newcom kit to \$349 for the Sony. The most expensive kit, the Sony, turns out to be the best buy for most people.

Kit features don't vary significantly. All kits contain a DVD-ROM drive, a hardware decoder board, and an assortment of software titles. The Hi-Val, Newcom, and Sony kits all use Sigma's Hollywood Plus MPEG-2 decoder board. (Hi-Val also offers a \$428 version of its kit that lets you transmit video from your PC to a TV screen that's located elsewhere in the house.) ►

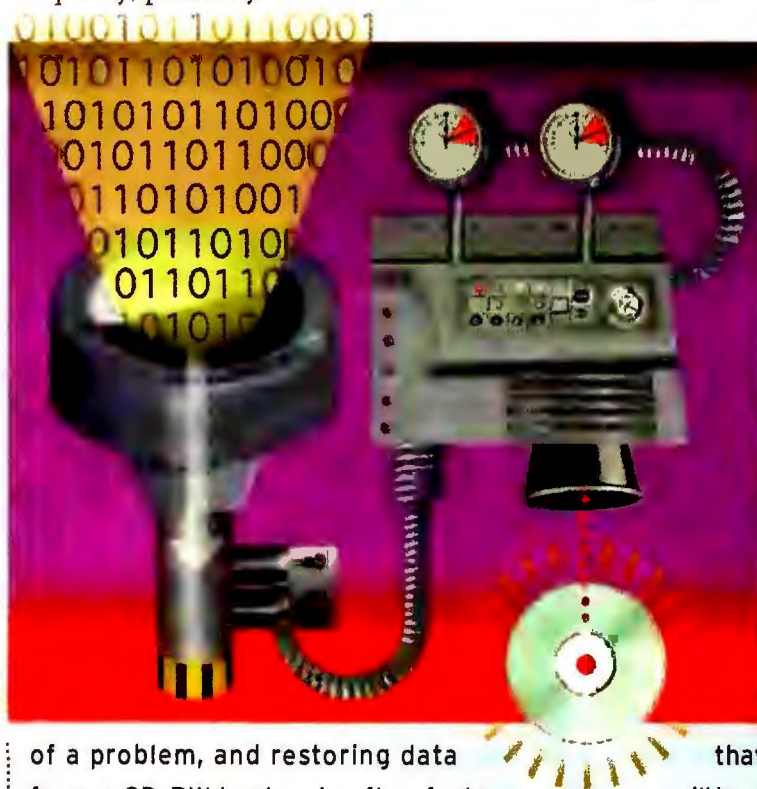
## Write On!

THOUGH DVD-ROM and CD-ROM are the most popular optical drive formats today, neither of them let you burn your own discs. If you need to back up data files, create distribution discs for your own software, make audio CDs, or copy CD-ROM discs, check out two writable formats: CD-Rewritable and DVD-RAM. Both formats are gaining presence in the marketplace, both let you read from and copy to optical discs, and both are great for making backups.

### Still a CD World

BY FAR THE MORE MATURE and prevalent of the two drive formats, CD-RW makes the most sense if you want to distribute discs now. CD-RW drives sell for as little as \$300 and let you burn both write-once CD-R discs and rewritable CD-RW optical discs. CD-R discs hold special appeal because they can cost as little as a buck apiece, and most PCs can read them. Rewritable CD-RW and DVD-RAM discs cost a lot more (\$10 to \$15, and \$20 to \$50, respectively), and you'd be hard put to find other machines they work in.

But a CD-RW drive isn't everybody's solution. These drives don't support the DVD-ROM format or play DVD games and movies. In addition, although they're fast readers, CD-RW drives are relatively slow writers: Copying a CD-ROM can tie up your PC anywhere from half an hour to half the afternoon. Even so, if you're interested mainly in creating your own discs, the slow writes won't cause much



of a problem, and restoring data from a CD-RW backup is often faster than using a tape or Zip drive. But if you want to back up very large files or make an exact copy of your hard disk, you may be happier with a higher-capacity solution such as a tape backup drive or a DVD-RAM drive.

Since DVD-RAM's arrival last summer, it has offered many of the advantages of DVD-ROM, including the ability to run CD- and DVD-based software. It stores up to 2.6GB (296 minutes of audio) per side, more than four times the capacity of CD-R and CD-RW discs. These capabilities make DVD-RAM tempting for users who could really sop up the extra space, such as those who back up lots of data files or who want to create large multimedia files (training applications, say) with different languages and multiple

views or camera angles. But get ready for sticker shock: These drives sell for a steep \$500 to \$1000.

DVD-RAM's main competitor, Sony's DVD+RW format, promises excellent backward compatibility with DVD-ROM drives, faster writing speeds than DVD-RAM, and up to 3GB of storage per side—slightly more space than DVD-RAM. The first DVD+RW drives are due out this summer; industry experts predict

that prices for the drives and discs will be similar to those for DVD-RAM. But

you won't be able to read a DVD-RAM disc on a DVD+RW drive, or vice versa. In addition to Sony, Hewlett-Packard, Mitsubishi, Philips, and Ricoh plan to ship DVD+RW drives.

### DVD Will Dominate

RIGHT NOW CD-RW boasts the most talent: It's the only drive able to burn cheap CD-R discs that are readable by almost any PC. But if you want to perform big backups, have a big budget, and don't need to distribute discs, take a hard look at DVD-RAM. Which format will prevail? With demands for faster, higher-capacity drives growing every day, the eventual standard will almost certainly be based on DVD technology. For more information, see this month's *Top of the News*.





# Trouble mounting?

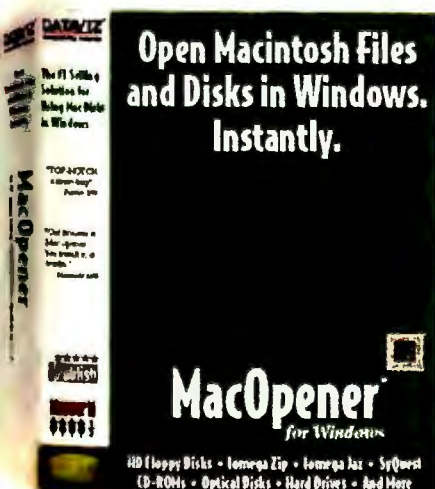
***In a world where Windows and Macintosh incompatibility causes endless problems, DataViz offers a little help. MacOpener®. A convenient utility that surmounts all obstacles when your PC needs to read, write and format Macintosh disks.***

With MacOpener installed on your PC, reading and writing files on a Mac-formatted disk, cartridge or CD is a breeze. MacOpener lets you open the disk on your PC just as if it were formatted for Windows. You can then view the contents and copy files to and from the disk from any Windows application. MacOpener automatically adds the right PC extension to Macintosh files, so you can launch a Windows application by simply clicking on the file. It even lets you format the Mac disk just as if it were a PC disk. How's that for trouble free performance?

At DataViz, solving PC to Mac compatibility problems is our business. As well as MacOpener, we offer Conversions Plus®, the premier file conversion program that translates hundreds of different file formats between PC applications or Macintosh and PC applications. Quickly and accurately. And offers over 1,000 file translation combinations, to solve almost any file conversion needs.

***So discover for yourself that with DataViz, no file compatibility problems are insurmountable.***

**For answers to all your Mac to PC disk and file compatibility needs, call us at 1-800-270-0030 Ext 121 or visit our web site at <http://www.dataviz.com/mopcw>**



**DATAVIZ®**  
**Compatibility. Instantly.**

Runs on Windows 3.1, Windows 95 & 98, Windows NT.

Available at

**COMPUSA**  
THE COMPUTER SUPERSTORE

**MICRO CENTER**  
THE COMPUTER DEPARTMENT STORE

**Fry's**

All product names are trademarks of their respective holders.

Circle 176 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



The greatest variations among the kits are in their software bundles, and even here, the disparity is mostly in the games and entertainment titles. Of the kits, only Sony gives you anything you might find useful in an office: Funk & Wagnall's Unabridged Encyclopedia on CD-ROM.

Whether we viewed movies on a big-screen monitor or a TV set, the four kits that we managed to get working (all but the Pacific Digital) produced very similar, impressive images and sound. However, the Creative Labs kit, which uses a different MPEG-2 decoder board from the rest, generated slightly fuzzy images at smaller window sizes. On the other hand, we preferred Creative's on-screen DVD player, which resembles a VCR remote control and is instinctively easy to use. Sigma's software proved just as capable but makes you navigate too many menus. We sometimes struggled to find the right control for basic operations, such as setting the language or adjusting color contrast.

Our tests show that most shoppers need not worry about drive performance. All five DVD-ROM drives read CD-ROM discs

at speeds similar to those of a standard CD-ROM drive, and we found only minor differences among them in DVD-ROM performance. Installation can be another story. Even if you consider yourself technically savvy, you should factor support quality into your buying decision, because getting these kits to work properly can be tricky. With most vendors, we endured long hold times, waited a long time for callbacks, and received only satisfactory support. Sony was the exception: We got an instant response almost every time.

at speeds similar to those of a standard CD-ROM drive, and we found only minor differences among them in DVD-ROM performance. Installation can be another story. Even if you consider yourself technically savvy, you should factor support quality into your buying decision, because getting these kits to work properly can be tricky. With most vendors, we endured long hold times, waited a long time for callbacks, and received only satisfactory support. Sony was the exception: We got an instant response almost every time.

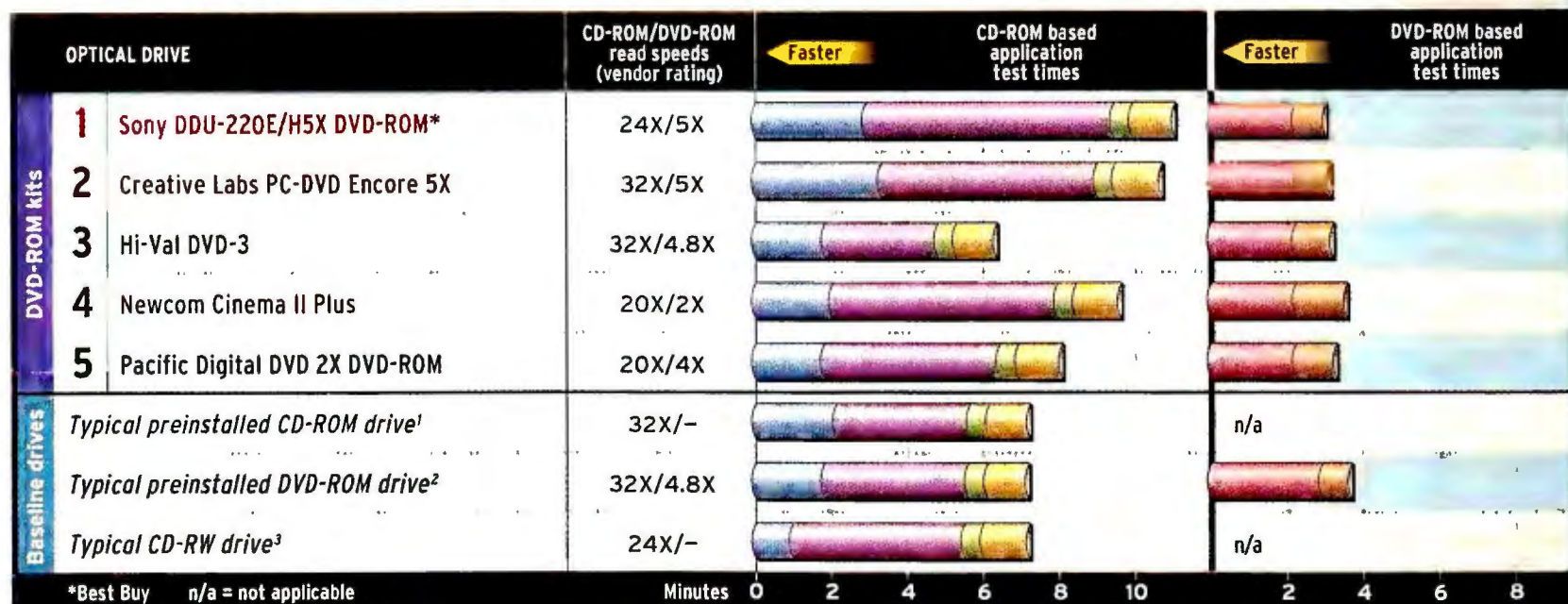
Creative Labs

**SURF'S UP:** The PC-DVD Encore 5X is affordable at only \$250, and Creative Labs did a great job of making the on-screen buttons look like a remote control. But if you have to call tech support, make sure you have a redial button.

## TEST REPORT

# Hi-Val DVD Tops CD-ROMs at Their Game

But most users will see little speed difference between these drives in daily use.



MS Office 97 Professional Install DeLorme AAA Map'n'Go PhoneDisc Corel PhotoCD PhoneDisc DeLorme AAA Map'n'Go

**TEST HOW WE TEST** We tested the drives for disc read performance using a set of scripts of common tasks, four for CD-ROM reading and two for DVD-ROM reading tasks. We timed how long it took each drive to complete each script. For the CD-ROM tests, we tested how long it took to copy Microsoft Office Professional installation files, to create a cross-country trip route using DeLorme's AAA Map'n'Go program, to search the PhoneDisc disc for 47 phone numbers, and to display 100 photos from a Corel PhotoCD disc. For the DVD-ROM tests, we repeated the DeLorme and PhoneDisc tasks using the DVD-ROM version of these discs. We tested all drives under Windows 98 using a Dell Dimension Pentium II-333 adapter mini-tower equipped with 64MB of RAM, a 10GB hard drive, and integrated ATI Rage Pro 3D 2X AGP graphics. Data based on tests designed and conducted by the PC World Test Center. All rights reserved. <sup>1</sup>Average of times for Sony CDU-701 and Toshiba XM-6202B drives. <sup>2</sup>Average of times for Hitachi GD-2500 and Toshiba SD-M1202 drives. <sup>3</sup>Hewlett-Packard CD-Writer Plus 81101.



PlexWriter 8/20 & PlexWriter RW 4/2/20

# Write Like a Genius.

VIBRATION DAMPERS  
ENHANCE HIGH SPEED  
WRITE RELIABILITY

8X CD  
RECORDABLE

TWICE AS  
FAST AS  
4X RECORDER

HUGE 4MB  
BUFFER

ALSO A GREAT  
CD-ROM READER  
(20X MAX/170ms)

PROVEN MEDIA  
COMPATIBILITY

ARCHIVE 74 MIN  
DATA IN < 10 MIN

PLEXWRITER 8/20  
CD-RECORDABLE DRIVE

BACK UP 650 MB  
DATA IN < 20 MIN

2X CD-  
REWRITABLE

TWICE AS FAST  
AS 2X  
RECORDERS

FAST SCSI,  
10 MB BURSTS

ALSO A GREAT  
CD-ROM READER  
(20X MAX/170ms)

4X CD-  
RECORDABLE

PROVEN MEDIA  
COMPATIBILITY

PLEXWRITER RW 4/2/20  
CD-REWRITABLE DRIVE



## Introducing two new Plextor CD writers. The fastest and most reliable performance in their class.

**PlexWriter 8/20 CD-Recordable Drive.** With 8X write speed, 20X read speed and 170ms access time, it's twice as fast as any 4X recorder. Archive 74 minutes of data in under 10 minutes. You can even replace your old CD-ROM drive and get two drives in one.

Fast SCSI burst rates, vibration dampening, superior cooling action and a hunky 4MB buffer ensure eagle-eye read-and-write accuracy. Fool-proof media recognition automatically adjusts power and burn time—so you can write without failure. And bundled software supports CD to CD-R direct duping, digital audio capture/playback and HDD recovery from bootable CD.

The PlexWriter 8/20 CD-R. Available late November 1998.

**PlexWriter RW 4/2/20 CD-ReWritable Drive.** Another high-performance first for Plextor. Now you can replace your 8X and under CD-ROM drive and get two drives performing three functions—all in one tough shell. With 4X write, 2X re-write, 20X read and 170ms access time, it's twice as fast as most 2X CD-RW drives. Back-up 650MB of data in under 20 minutes with drag and drop simplicity.

Fast SCSI burst rates and a 2MB buffer ensure read-and-write accuracy every time. Fool-proof media recognition automatically adjusts power and burn time—so you can write without failure. And bundled software supports CD to CD-R direct duping, digital audio capture/playback and HDD recovery from bootable CD.

The PlexWriter RW 4/2/20. Available after January 1, 1999.



Show your intellect. Call 888-412-7539 or visit <http://www.plextor.com/contest/pcuworld.html>—enter to win a PlexWriter 8/20.

©1998, Plextor Corp. All Rights Reserved. All trademarks or registered trademarks specified are owned by their respective holders.

Circle 152 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



matching connectors. You may have to change the preset master-slave jumper on the new drive when you're first installing it. Otherwise, setting up your DVD-ROM drive is a breeze.

Installing MPEG-2 hardware decoder boards is another story. When you choose a kit, we strongly recommend you buy one backed by the best support available and a no-fee, unconditional money-back guarantee. For the most part, our installations went smoothly, but we tested the kits on a new Dell Dimension PII-333 with plenty of empty slots and two or three free hardware interrupts. In a more typical scenario, a *PC World* editor encountered so many problems trying to install the Hi-Val kit on his own Dell Dimension PII-300, his ten-day money-back period expired before he could get them resolved. In that instance, reps suggested a wide range of complex fixes, from upgrading the PC BIOS to upgrading the DVD-ROM drive BIOS, to swapping around IRQ and memory ad-

resses manually. He never got the problem resolved. Vendors themselves confirm that your experience could be nasty: "Even people with engineering backgrounds have problems," said one vendor spokesperson. "It's supposed to be plug and play, but far too often it's plug and pray."

Of the kits tested for this review, Pacific Digital's gave us the most headaches. The company failed to in-

clude a cable needed to connect the decoder board to the system video board. (A not entirely helpful support rep told us to count the pins on our video feature connector and buy a cable at Radio Shack.) Pacific Digital includes a driver disc, but when the installation crashed, a different rep explained that some driver discs had been shipped without drivers. After we grabbed the drivers off the company's Web site, the player loaded, but it crashed again as soon as it tried to play a DVD ►

**VID KID:** The Hi-Val DVD-3 serves up great video and is well priced at \$279. But if you need to call tech support, leave a message, and prepare to wait hours—or days—for a callback.

**Hi-Val**

## Decode Softly



INDUSTRY HEAVY-HITTERS like Intel have long extolled the virtues of software DVD. But when we played movies through a software decoder, they stuttered, froze, and dropped frames while the CPU struggled to keep up. Now, finally, high-octane processors make watching movies on a PC through software DVD an enjoyable experience.

Software DVD MPEG-2 decoders, which include movie playback controls, offer many

benefits. For starters, they're a lot cheaper than hardware decoders. Some vendors, like Dell, even include a software player gratis when you buy a new PC with a DVD-ROM drive. Better yet, software DVD spares you the installation woes associated with a decoder board. And if your PC has a fast CPU, a software decoder can work *better* than a board-based kit. Its main drawback: You may not be able to send decent DVD images to a TV screen. Most images from video boards with TV-out connections lack the crispness of video from a dedicated decoder board.

Many of the most popular movie playback utilities, including the one from Newcom that we tried, are based on Zoran's SoftDVD Navigator. We installed the software easily, and it worked perfect-

ly from the get-go. Movies and games looked terrific on our Pentium II-333 system: no lost frames, distortions, or jaggy patches. To our eyes the image looked virtually identical to the one produced by Sigma's Hollywood Plus MPEG-2 decoder board, and the stereo sounded fine.

SoftDVD Navigator controls functions such as play, stop/pause, fast forward/rewind, and audio volume. In fact, some functions worked smoother on the Zoran player than on DVD kits we tested that use hardware decoders.

Bottom line: If you've got a high-end PC and don't need to display video from it on your TV screen, go for a software-only DVD solution. Software DVD costs less, is easier to set up, and—if you can supply the processing power—offers impressive image quality.

## and Carry a Big Chip



# HAVE WE GOT YOUR ATTENTION YET?



1998 Vision Master 450



October 6, 1998  
VisionMaster 450



May 1998 VisionMaster 450



Perfect Five-Star Rating  
January 1998  
VisionMaster 450



**VisionMaster 450**  
**\$599 ESP**



April 1998 VisionMaster 450

The awards we are winning are your assurance that iiyama monitors are built to meet the strictest standards of quality. For exceptional clarity, durability and low emissions, iiyama monitors are the clear choice.

CRT Monitor Model/ Viewable Area	TCO	Dot Pitch/ CRT Type	Max. Horizontal Scan Rate	Max. Resolution	Est. Street Price
21" VisionMaster Pro 502 (19.5" VIS)	TCO '95	0.28mm/AG	110khz	1800 x 1440@74hz	\$999
VisionMaster Pro 501 (19.5" VIS)	TCO '95	0.28mm/AG	96khz	1600 x 1200@75hz	\$939
VisionMaster 502 (19.5" VIS)	TCO '95	0.27mm/dp	110khz	1800 x 1440@74hz	\$999
VisionMaster 501 (19.5" VIS)	TCO '95	0.27mm/dp	96khz	1600 x 1200@75hz	\$939
19" VisionMaster Pro 450 (18.0" VIS)	TCO '95	0.25mm/AG	102khz	1600 x 1200@80hz	\$699
VisionMaster 450 (18.0" VIS)	TCO '95	0.26mm/dp	102khz	1600 x 1200@80hz	\$599
17" VisionMaster Pro 400 (16.0" VIS)	TCO '95	0.25mm/AG	96khz	1600 x 1200@75hz	\$498
VisionMaster 400 (16.0" VIS)	TCO '95	0.26mm/dp	96khz	1600 x 1200@75hz	\$438
S702GT (16.0" VIS)	TCO '95	0.28mm/dp	96khz	1280 x 1024@85hz	\$369
15" VisionMaster 350 (13.7" VIS)	MPR-II	0.28mm/dp	69khz	1280 x 1024@65hz	\$219



**iiyama**



ISO 9001

**For the name of your local dealer call: (800) 394-4335 • [www.iiyama.com](http://www.iiyama.com)**

© 1998 iiyama North America, Inc. All rights reserved. iiyama, the iiyama logo, and the RSVP logo are trademarks of iiyama North America, Inc. All other trademarks are the properties of their respective owners.  
Estimated Street Price is shown, actual price may vary. Prices do not include shipping, handling and any applicable taxes. Specifications are subject to change without notice.  
For more information, please write us at 575 Anton Blvd., Suite 590, Costa Mesa, CA 92626. 800/394-4335, 714/437-5111; Fax: 714/437-5982



Perfect Five-Star Rating  
January 1998  
VisionMaster Pro 500



Perfect Five-Star Rating  
November 1997  
VisionMaster Pro 17



January 6, 1998  
VisionMaster Pro 17



Performance & Technical Excellence  
March 1997  
VisionMaster Pro 21



Six Time Winner  
Jan 1997, Feb 1997, March 1997,  
April 1997, May 1997, June 1997  
VisionMaster Pro 21



October 7, 1997  
VisionMaster Pro 17  
October 6, 1998  
VisionMaster 450



September 1998  
VisionMaster Pro 502



Twelve Time Winner  
July 1996, Jan 1997, March 1997, July 1997,  
Sept 1997, Jan 1998, March 1998,  
May 1998, July 1998, Sept. 1998  
VisionMaster Pro 17  
April 1998, August 1998  
VisionMaster 450

Circle 108 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



disc. After two days of struggling, Pacific Digital's support department gave up, compelling us to do likewise. We ultimately tested the drive's performance without the decoder board installed. (A decoder board doesn't affect drive performance; it only decodes the MPEG-2 video that the PC reads off the disc.)

### WHAT PERFORMANCE ANXIETY?

JUDGING BY THIS CROP of kits, optical-drive speed isn't an issue for most buyers. It's just as well, because vendors' speed ratings don't always match what you'll get. As long as the DVD-ROM drive is rated at 2X or higher for DVD, you'll be fine.

Most software titles ship on CD-ROM discs, so you need a DVD-ROM drive that measures up to standard CD-ROM performance. Not to worry: The most-common CD-ROM drives do perform slightly better than the DVD-ROM drives we tested (with the notable exception of the speedy Hi-Val), but the differences are too small for most people to notice. We also found no great differences in DVD-ROM performance among the kits.

In the CD-ROM realm, each X represents 150 kilobytes per second of data transfer from the disc; each DVD-ROM X equals 1350 KBps. In theory, the more X a drive offers, the faster it transfers data—

but you'd never know it judging by the results of some of our real-world application tests. For example, the drives rated at 20X and 24X for reading CD-ROM discs generally outran Creative Labs' PC-DVD Encore 5X kit, rated at 32X.

To see how CD-ROM drives and DVD-ROM drives stack up against one another, we timed how long all the drives took to complete our CD-ROM application tests (we included times for our CD-RW and CD-ROM baseline units). We installed Microsoft Office 97 Professional, timed the creation of a cross-country trip using DeLorme AAA Map'n'Go, searched for phone numbers on PhoneDisc Power Finder, and ran a 100-photo slide show from Corel Photo-CD Labs 2.0. For the DVD-ROM drives, we repeated the PhoneDisc and AAA Map'n'Go benchmarks using these applications' DVD-ROM versions. ►

## Battle for the Boob Tube

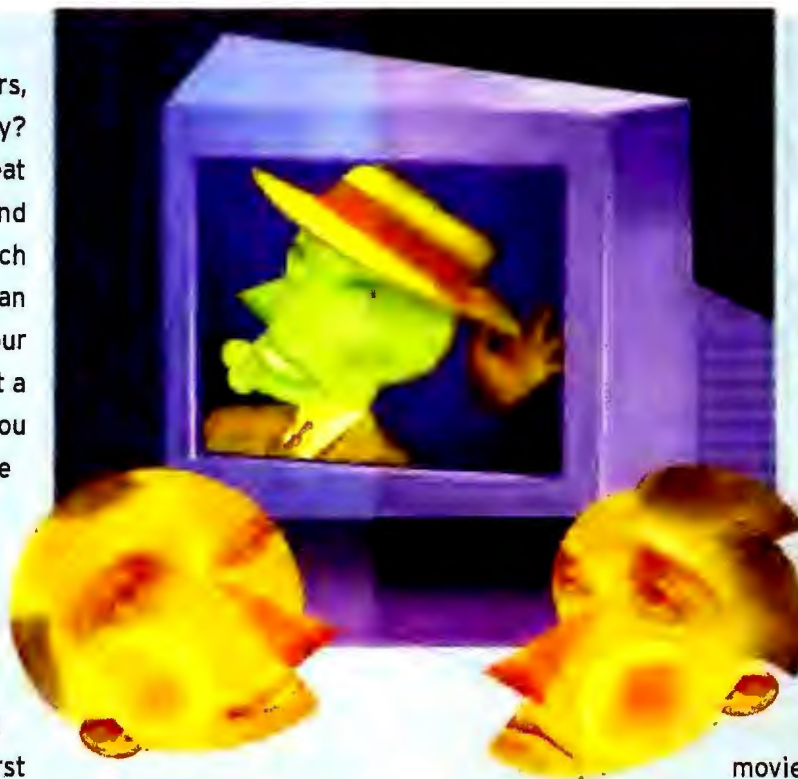
YOUR VCR HAS been doing the job for years, but who doesn't want better video quality? Dedicated set-top DVD players provide great images and sound, but they cost \$400 and up. What about a PC-based DVD kit, which promises the same video quality for less than half the cost? Hook up a few cables from your computer to your TV set, and you can start a collection of DVD movies with the \$200 you save. And you get a nice PC upgrade in the bargain.

### Tape Versus Disc

TO TEST THIS ALLURING scenario, we arranged a shoot-out between a VCR, a DVD player, and a DVD-ROM PC with a Sigma Hollywood Plus MPEG-2 board. First we threw some popcorn into the microwave. Then we dragged a small jury of *PC World* editors away from their deadlines and forced them to watch Jim Carrey's *The Mask* on a TV screen in three formats: VHS, DVD player, and PC-DVD. We compared sharpness, steadiness, color saturation, and ease of control.

The DVD player emerged the victor. Viewing a DVD film, regardless of the source, is vastly superior to watching it on a VCR. The VHS tape, fresh out of the shrink-wrap, still produced much fuzzier pictures than DVD.

To our surprise, the quality of the video reeling off the PC-DVD drive matched what



we saw from the stand-alone player, except for a small band of jiggly video at the bottom of the frame. It was the humble remote control, however, that swayed us to the stand-alone player. The player comes with a remote, something we wished we had with the PC-based DVD-ROM unit—especially since our PC wasn't in the same room as our TV set. To take a break during the movie, we had to run into the den, hit the pause button, and rewind a little to make up for the time it took us to pause. When we were ready to resume watching, we had to go into the den again and then race back to the living room. We also found

that switching video output between the PC monitor and the TV sometimes caused trouble. Occasionally we lost the DVD menu, menu choices quit working or disappeared, the PC's monitor went blank, or the PC crashed. Another time we had to reinitialize the Hollywood Plus player defaults. If you've got a roomful of kids waiting to see *Lion King*, this is not the way to run a movie theater.

### TV Versus PC

IF YOU DON'T MIND watching movies on your PC's monitor, so much the better. DVD movies look great when played on a 17-inch monitor set for 1024 by 768 resolution, viewed from a distance of 5 or 6 feet. When you display DVD on a TV, you see scan lines, and tiny chromatic flaws where one bright color moves across another; the PC monitor displays a perfect image, much like a movie screen does. On the other hand, colors on the monitor appear paler than those on the TV. And of course, if you and your family prefer to sit more than 6 feet from the screen—say, on a sofa across the room from a bright, big-screen TV—your PC monitor can't compare.



# FREE

## Guide to power protection

How to keep your system up and running  
all time with APC's Legendary Reliability.



Mail or fax this completed coupon for your  
FREE Guide to power protection. Better yet,  
order it today at the APC Web site!

KEY CODE

<http://promo.apcc.com> i585z  
888) 289-APCC x8307 • FAX: (401) 788-2797

# APC®

Legendary Reliability™

☐ **YES!** Please send me my FREE Guide to power protection.

☐ **NO,** I'm not interested at this time but please add  
me to your mailing list.

APC Back-UPS Office® and Back-UPS Pro®



Name: \_\_\_\_\_

Title: \_\_\_\_\_ Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/Town: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_ Country: \_\_\_\_\_

Phone: \_\_\_\_\_

Brand of UPS used? \_\_\_\_\_

Brand of PC used? \_\_\_\_\_

Brand of Servers used? \_\_\_\_\_





NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

# BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 36 WEST KINGSTON, RI

POSTAGE WILL BE PAID BY ADDRESSEE

**APC**<sup>®</sup>

AMERICAN POWER CONVERSION

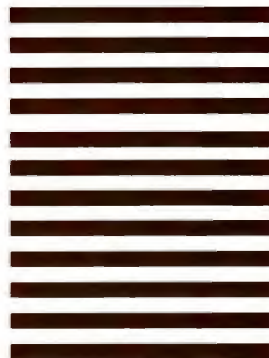
KEY CODE: i585z

Department: C

132 FAIRGROUNDS ROAD

PO BOX 278

WEST KINGSTON RI 02892-9920



## How to Contact APC

Call: (888) 289-APCC

*use the extension on the reverse side*

Fax: (401) 788-2797

Visit: <http://promo.apcc.com>

*use the key code on the reverse side*

**APC**<sup>®</sup>

Legendary Reliability™



# Nothing lasts longer.

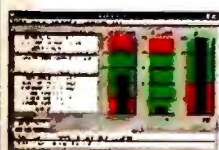
## The world's best-selling UPSs now start at \$99.<sup>00</sup>

With over 45% of all data loss and downtime caused by bad power, your investment in an APC uninterruptible power supply (UPS), with surge protection and battery back-up, pays for itself the first time you use it. APC Back-UPS provides clean, consistent power to your CPU and monitor, plus power protection for your external modem, laser printer, fax machine, or Zip™ drives, all backed by a \$25,000 guarantee\*. Plus, telephone/network surge suppression keeps you safe when you're online. APC Back-UPS: the power and features you want plus the peace of mind you get with APC's Legendary Reliability™.



APC Back-UPS®, APC Back-UPS Office® and APC Back-UPS Pro® will provide runtime which meets or exceeds that of any same VA UPS for desktop PC applications or your money back. (See policy for details.) For more information, visit [www.apcc.com](http://www.apcc.com).

### Back-UPS Pro® Power User Features



- PowerChute® plus power management software automatically saves data, closes programs, and shuts down your computer.

- Automatic battery self-test ensures battery readiness



- "Your PC's data is your life. Don't take any chances. The Back-UPS Pro 650 gives you

650VA protection and the longest battery life of any UPS we tested." - PC Computing

- Automatic Voltage Regulation (AVR)
- User-replaceable battery
- Push-button circuit breaker eliminates the need to replace a traditional fuse or replace the UPS
- Internet and network-ready
- Transformer block spacing

- Site Wiring Fault Indicator automatically identifies building wiring problems
- Longest Runtime Guarantee
- \$25,000\* guaranteed lifetime equipment protection (\*See policy for details.)

**APC**  
Legendary Reliability™

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Company: \_\_\_\_\_  
Address: \_\_\_\_\_  
City/Town: \_\_\_\_\_

State: \_\_\_\_\_  
Zip: \_\_\_\_\_ Country: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Brand of UPS used? \_\_\_\_\_ # \_\_\_\_\_  
Brand of PCs used? \_\_\_\_\_ # \_\_\_\_\_  
Brand of Servers used? \_\_\_\_\_ # \_\_\_\_\_

### FREE Guide to Power Protection



- ☐ **YES!** I want to learn how to choose the right UPS for my system. Please send my FREE Solutions guide.
- ☐ **NO,** I'm not interested at this time, but please add me to your quarterly newsletter mailing list.

Order now <http://promo.apcc.com> Key Code i585z

888-289-APCC x8307 • FAX: 401-788-2797  
Circle 45 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



In the Photo-CD Labs and two Phone-Disc tests, all drives finished their tasks within a few seconds of one another. We found greater differences in the Office 97 installation tests: Creative Labs' drive took over a minute more than the average bundled CD-ROM drive to install Office 97. While this difference is noticeable, it usually doesn't matter. Most users spend very little time installing large applications.

We did see a big speed gap when plotting travel routes using the CD-ROM version of DeLorme's AAA Map'n'Go. If you use travel-routing software frequently, either stick with a fast CD-ROM drive or upgrade to the DVD version of this route planner. Using the CD-ROM disc, the Hi-Val DVD-ROM kit aced this test, plotting our route in a little less than 3 minutes; the average CD-ROM drive took a little under 4 minutes. Meanwhile, our Best Buy Sony DVD-ROM kit took almost 6.5 minutes to complete the same task. Using the DVD-ROM disc,



however, the Sony drive finished the same task in only 48 seconds—the fastest time of all the drives that we tested.

### OPERATORS NOT STANDING BY

WE GOT THE DVD kits working without much hair-pulling, except for the Pacific Digital. But numerous factors affect how easy or hard it is to install decoder boards, including the video card you use and even the BIOS versions of the PC and DVD-ROM drive, so many users won't get off so lightly. Many of you will need support—and our own calls show most of you will have a tough time getting it.

## Pacific Digital

cases, getting through to a live person was an ordeal. Even Sony, which answered all our calls instantly, accidentally dropped us once and never called back.

Still, that's better than our experiences with Sony's competitors. When we called Hi-Val's support, we always had to leave a message, even during standard business hours. The first time, a rep called us back 2 hours later; our next call was returned after 7 hours. We fared worse with Creative Labs: After many busy signals, we final-

### DVD FOR LESS:

Newcom's DVD Combo Kit costs only \$229 and offers video quality that puts your VCR to shame. But if you need to call tech support? Make sure you have a good novel and the patience of Job.

## Newcom

The support policies look solid. Sony offers round-the-clock help, and all the companies but Pacific Digital provide at least some weekend hours. But looks can be deceiving: We called each firm at least twice and found that even the best support—Sony's—is far from ideal. In most

ly got a voice-mail menu that kept us on hold for 16 minutes before a rep picked up. Newcom was worse still: After three calls, one disconnect, and nearly an hour and a half on hold, we got voice mail telling us to leave a message. We finally heard back from tech support the next day.

Almost all the technicians we spoke with were courteous, but some of them provided little or no help. The Sony, Creative Labs, and Hi-Val people were on the money every time; Newcom's reps were right once, wrong once. Pacific Digital's support technicians spent two days trying to help us get the decoder board working before they finally gave up, muttering vaguely about undocumented Windows error messages and incompatibility issues with our video board.

### BUY NOW, PLAY LATER

WHEN YOU GET DOWN TO IT, few people really need a DVD-ROM drive—yet. But if you're buying a new PC or have to replace your CD-ROM drive, DVD-ROM's appeal grows stronger by the day, thanks to dropping prices and the imminent arrival of more business-oriented DVD titles. And if DVD games and movies make your heart beat faster, so much the better. Many people today routinely pop audio CDs into their PCs. Before too long, you may be doing the very same thing with your favorite movie.

Michael Goodwin is a frequent contributor to PC World and specializes in writing about desktop and notebook computers. Applications-based performance tests conducted by Mike Salayko of the PC World Test Center. ■



1. Start image editing software
2. Choose "file acquire"
3. Pre-scan page
4. Set scan area
5. Set resolution
6. Set scan mode
7. Scan page
8. Close TWAIN
9. Save file
10. Close image editing application
11. Start e-mail package
12. Start new message
13. Choose "attach file"
14. Locate saved file on hard disk

How to scan and e-mail  
a photo from their scanner.

How to do it  
from ours.

# One small step for scanners. 13 fewer steps for you.

Let's face it, most scanners are not as simple  
as they are supposed to be.

Drag and drop, plug and play,  
billions of colors, and all the other  
terms and specs don't make a bit of  
difference when all you want to do is  
e-mail a photo, scan a page of text  
into your word-processor or any of the  
other tasks you do countless times a day.

PaperPort OneTouch offers a simpler, more elegant  
solution. It does most of the work for you, thanks to tight  
integration with our PaperPort software.

Drop in your original. Push a button. It's that easy. Hold  
down a button, change a few settings, and your  
scanner is practically a whole new machine.

Sure, we have all the specs and  
features you expect in a  
quality scanner. But we  
think you'll be much more  
impressed with those five  
friendly buttons up front.

PaperPort OneTouch.  
All scanners should be this simple.



- Printer port pass-through design • Lift-off lid • Includes PaperPort software
- Windows 95/98/NT 4.0 compatible

Circle 255 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



Visit our website at [pcw.visioneer.com](http://pcw.visioneer.com)



# Introducing Compaq Prosignia for growing businesses.

The best products and prices, direct from Compaq.  
The hottest Internet solutions, direct from Compaq.  
World-class service and support, direct from Compaq.

Compaq Prosignia™ is a new line of powerful, top-quality, state-of-the-art computer systems. (Okay, so far your existing view of Compaq is safe.)

But, at prices low enough to fit the tightest budget?

With access to a whole suite of Internet solutions, optimized for growing businesses? Available not only from a reseller, but direct from Compaq via the Web or the phone?

The answers: yes, yes and yes. Fact is, we at Compaq are committed to doing whatever it takes to be the best technology partner a growing business ever had. To make it as easy and as affordable as possible for you to choose, order and own (or lease, if you prefer) the leading-edge systems and solutions you need. And to be there for you, today and well down the road.

It's all as close as your phone, your Web browser or your authorized Compaq reseller (1-800-282-6672).

So welcome to Prosignia.

It's what to feed a growing business.

**COMPAQ**

Better answers.™



**Introducing Compaq Prosignia.  
What to feed a growing business.**



**COMPAQ**  
*DirectPlus*

Best of all, it's direct from Compaq: [www.directplus.compaq.com](http://www.directplus.compaq.com) or 1-800-888-5807



# Prosignia

## Desktops



### **Affordable new desktop solutions for your business.**

Looking for an affordable desktop solution that can help your business work smarter? Meet the new Compaq Prosignia Desktops.

Our new desktops are specially designed for small and medium businesses. They combine the latest technology with the most popular business software.

If your company has specific needs, we can custom configure a solution for you.



#### **Prosignia desktops include:**

- Custom configurations
- Immediate productivity with pre-installed Microsoft Office SBE, Norton AntiVirus, Carbon Copy Host, Training Program for Microsoft Office
- PremierSound audio with speakers and Compaq Microsoft Intellimouse
- Free\* trial of Compaq Online Services\* — a group of Internet-powered solutions (see back cover)





## Consider these options:

- Upgrade to S900 19" Monitor (18" viewable) **\$200<sup>6</sup>**
- Iomega Zip Drive **\$99<sup>6</sup>**
- Upgrade to Altec Lansing 3-Piece Speakers **\$85<sup>6</sup>**
- 3Com 10/100 TX NIC **\$65<sup>6</sup>**
- Upgrade to Microsoft® Windows NT® **\$99<sup>6</sup>**



For more desktop options,  
visit our website or ask your  
sales representative.

**Choose one of these recommended configurations. Or customize a Prosignia to meet your specific needs.**

	Prosignia Desktop 310		Prosignia Desktop 330		
Processor	Intel® Celeron® 300A/66MHz	Intel Celeron 333/66MHz	Intel Pentium® II 350/100MHz	Intel Pentium II 400/100MHz	Intel Pentium II 450/100MHz
Cache	128KB integrated	128KB integrated	512KB L2	512KB L2	512KB L2
Memory	32MB SDRAM	64MB SDRAM	64MB SDRAM	128MB SDRAM	128MB SDRAM
Hard Drive	8.4GB	8.4GB	10GB	13.5GB	16.8GB
CD-/DVD-RDM	40X <sup>1</sup> Max CD-ROM (optional upgrade to DVD-ROM available on some models)				
Modem	Compaq 56K V.90 data/fax modem <sup>2</sup>				
Video Card/Memory	Matrox G100 AGP/4MB	Matrox G100 AGP/4MB	Matrox G200 SD AGP/8MB	Matrox G200 SD AGP/8MB	Matrox G200 SD AGP/8MB
Total Slots/Bays	6/5	6/5	6/5	6/5	6/5
Compaq Color Monitor <sup>3</sup>	S700 17" (15.7" viewable)	S700 17" (15.7" viewable)	S700 17" (15.7" viewable)	S700 17" (15.7" viewable)	S700 17" (15.7" viewable)
Diskette Drive	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB
Ports	ECP Parallel, Keyboard, 2 Serial, 2 USB, Mouse				
Keyboard/Mouse	104-key/Compaq Microsoft® Intellimouse™				
Audio/Speakers	Compaq PremierSound / 2-Piece Speakers				
Pre-installed Operating System	Microsoft Windows® 98	Microsoft Windows 98	Microsoft Windows 98	Microsoft Windows 98	Microsoft Windows 98
Productivity Suite	Microsoft Office Small Business Edition V2 (Optional Microsoft OfficePro97 available), Training Program for Microsoft Office, Norton AntiVirus, and Carbon Copy Host				
Online Services <sup>4</sup>	Free <sup>4</sup> trial of Compaq Online Services				
Limited Warranty <sup>5</sup>	3-Year	3-Year	3-Year	3-Year	3-Year
New Low Prices <sup>3</sup> :	<b>\$1,279<sup>6</sup></b>	<b>\$1,399<sup>6</sup></b>	<b>\$1,599<sup>6</sup></b>	<b>\$1,849<sup>6</sup></b>	<b>\$2,099<sup>6</sup></b>
Lease Prices <sup>7</sup> :	<b>\$44/mo.</b>	<b>\$48/mo.</b>	<b>\$54/mo.</b>	<b>\$63/mo.</b>	<b>\$72/mo.</b>

**Sign up for a FREE<sup>4</sup> trial of our Compaq Online Services — a group of Internet-powered solutions.**

**Buy direct from Compaq: [www.directplus.compaq.com](http://www.directplus.compaq.com) or 1-800-888-5807**



# Prosignia

## Notebooks



### Hit the road with our powerful new portable solutions.

Working long hours in and out of the office? For almost all growing businesses, the answer is an emphatic "yes." With a Compaq Prosignia Notebook you'll have portable power that can boost your productivity — because you'll always be able to take your business applications and data with you.

Prosignia Notebooks deliver the latest technology at breakthrough prices — with industry-standard design and comprehensive support that makes them easy to own.



#### Prosignia notebooks include:

- Custom configurations
- One-Touch Internet Button
- Free\* trial of Compaq Online Services\* — with online *briefcase* for mobile professionals (see back cover)
- Immediate productivity with pre-installed Microsoft Office SBE, Norton AntiVirus, Carbon Copy Host, Training Program for Microsoft Office
- Optional Compaq CarePak: enhanced service and extended warranty available; Prosignia includes 3-year limited warranty





## Consider these upgrades:

- Convenience Base (Pass-Through) **\*189<sup>6</sup>**
- 64MB to 96MB Memory **\*65<sup>6</sup>**
- 24X<sup>9</sup> Max CD to DVD Drive **\*199<sup>6</sup>**
- Additional Li-Ion Battery **\*129<sup>6</sup>**
- Compaq Value Carrying Case **\*49<sup>6</sup>**



For more notebook options,  
visit our website or ask your  
sales representative.

**Choose one of these recommended configurations. Or customize a Prosignia to meet your specific needs.**

	Prosignia Notebook 120	Prosignia Notebook 140	Prosignia Notebook 160
Processor	Mobile Intel® Pentium® II 233MHz	Mobile Intel Pentium II 266MHz	Mobile Intel Pentium II 300MHz
L2 Cache	512KB	512KB	512KB
Memory Std./Max.	64MB/160MB	64MB/160MB	64MB/160MB
SMART Hard Drive Std.	4GB	4GB	6GB
Display	12.1" SVGA CTFT (800 x 600)	13.3" CTFT (1024 x 768)	14.1" CTFT (1024 x 768)
CD-ROM/Diskette Drive	24X <sup>9</sup> Max/3.5" 1.44MB	24X <sup>9</sup> Max/3.5" 1.44MB	24X <sup>9</sup> Max/3.5" 1.44MB
Integrated Modem	Compaq 56K V.90 data/fax modem <sup>2</sup>	Compaq 56K V.90 data/fax modem <sup>2</sup>	Compaq 56K V.90 data/fax modem <sup>2</sup>
Battery Type/Life <sup>10</sup>	Li-Ion (up to 5 hours with the second battery installed)		
AC Adapter	Integrated	Integrated	Integrated
MultiBay	Supports one of these integrated components: Iomega Zip Plus, SuperDisk LS-120 Drive, 3.5" 1.44MB diskette drive, second hard drive or second battery		
PC Card Slots	2 Type II or 1 Type III	2 Type II or 1 Type III	2 Type II or 1 Type III
Sound	Compaq PremierSound	Compaq PremierSound	Compaq PremierSound
Pointing Device	Touchpad	Touchpad	Touchpad
One-Touch Internet Access Button	Yes	Yes	Yes
Ports	Enhanced Parallel, Serial, External Monitor, External Keyboard/Pointing Device, Convenience Base, Headphone/Line In, Microphone/Line In, AC Power, RJ11, Infrared, USB		
Intelligent Manageability	Included	Included	Included
Pre-installed Operating System	Microsoft Windows 98	Microsoft Windows 98	Microsoft Windows 98
Productivity Suite	Microsoft Office Small Business Edition V2 (Optional Microsoft OfficePro97 available), Training Program for Microsoft Office, Norton AntiVirus, and Carbon Copy Host		
Online Services <sup>4</sup>	Free <sup>4</sup> trial of Compaq Online Services		
Dimensions	2.3" x 12.5" x 9.9"	2.3" x 12.5" x 9.9"	2.3" x 12.5" x 9.9"
Worldwide Limited Warranty <sup>5</sup>	3-Year	3-Year	3-Year
New Low Prices:	<b>\$1,999<sup>6</sup></b>	<b>\$2,399<sup>6</sup></b>	<b>\$2,899<sup>6</sup></b>
Lease Prices <sup>7</sup> :	<b>\$68/mo.</b>	<b>\$82/mo.</b>	<b>\$99/mo.</b>

**Sign up for a FREE<sup>4</sup> trial of our Compaq Online Services — a group of Internet-powered solutions.**

**Buy direct from Compaq: [www.directplus.compaq.com](http://www.directplus.compaq.com) or 1-800-888-5807**



# Prosignia *Servers*



## **Build a strong foundation with our new servers.**

We've taken all that we've learned as the world's leading server vendor and designed the new Compaq Prosignia Server Family for the needs of growing businesses.

These new Compaq Prosignia Servers deliver a great deal for your money. Robust hardware and software testing helps ensure system compatibility and reliability. And you get all you need to meet your file and print, database, and communications needs right now. Plus something you need as your business grows: expandability.



### **Prosignia servers include:**

- Custom configurations on a range of servers
- Server Software Set-up Tool: Compaq SmartStart
- Server Management Tools: Compaq Insight Manager and Automatic Server Recovery
- Optional Compaq CarePac Service and Support





## Consider these options:

- 64MB SDRAM Memory Kit **\$228<sup>b</sup>**
- SMART 2SL Array Controller **\$697<sup>b</sup>**
- Additional 9.1GB Wide-Ultra SCSI-3 Hard Drive **\$681<sup>b</sup>**
- 4/8GB DAT Tape Drive **\$714<sup>b</sup>**
- 56K<sup>2</sup> ISA Fax Modem **\$125<sup>b</sup>**



For more server options,  
visit our website or ask your  
sales representative.

**Choose one of these recommended configurations. Or customize a Prosignia to meet your specific needs.**

	<b>Prosignia Server 720</b>	<b>Prosignia Server 740</b>	<b>Prosignia Server 740</b>
<b>Processor</b>	Intel® Pentium® II 400MHz	Intel Pentium II 400MHz	Intel Pentium II 450MHz
<b>Dual Processor Support</b>	No	Yes	Yes
<b>L2 Cache</b>	512KB	512KB	512KB
<b>Memory Std./Max.</b>	64MB/384MB ECC SDRAM	64MB/1GB ECC SDRAM	128MB/1GB ECC SDRAM
<b>SCSI Hard Drive</b>	4.3GB	9.1GB	Two 9.1GB Drives (18.2GB Total)
<b>Hard Disk Controller</b>	Wide Ultra2 SCSI	Integrated Wide-Ultra SCSI-3	Integrated Wide-Ultra SCSI-3
<b>Expansion Bays</b>	5 Total: 3 Removable, 2 Hard Drive	8 Total: 4 Removable, 4 Hard Drive	8 Total: 4 Removable, 4 Hard Drive
<b>Max Internal Storage</b>	27.3GB	54.6GB	54.6GB
<b>CD-ROM</b>	32X <sup>11</sup> Max	32X <sup>11</sup> Max	32X <sup>11</sup> Max
<b>Diskette Drive</b>	3.5" 1.44 MB	3.5" 1.44 MB	3.5" 1.44 MB
<b>Total Expansion Slots</b>	6 (3 PCI, 1 PCI/ISA, 1 ISA, 1 AGP)	6 (2 PCI, 4 PCI/ISA)	6 (2 PCI, 4 PCI/ISA)
<b>Network Interface Controller</b>	Integrated 10/100 TX UTP	Integrated 10/100 TX UTP	Integrated 10/100 TX UTP
<b>Redundant NIC Support</b>	No	Yes	Yes
<b>Software Setup</b>	SmartStart	SmartStart	SmartStart
<b>Server Management</b>	Compaq Insight Manager, Automatic Server Recovery	Compaq Insight Manager, Automatic Server Recovery-2, Integrated Remote Console	Compaq Insight Manager, Automatic Server Recovery-2, Integrated Remote Console
<b>Power Supply</b>	200W	325W	325W
<b>Compaq Monitor<sup>3</sup></b>	V55 15" (13.7" viewable)	V55 15" (13.7" viewable)	V55 15" (13.7" viewable)
<b>Worldwide Limited Warranty<sup>5</sup></b>	3-Year	3-Year	3-Year
<b>Pre-Failure Warranty<sup>13</sup></b>	Processor, Hard Drive	Processor, Memory, Hard Drive	Processor, Memory, Hard Drive
<b>New Low Prices<sup>3</sup>:</b>	<b>\$2,319<sup>6</sup></b>	<b>\$2,949<sup>6</sup></b>	<b>\$4,199<sup>6</sup></b>
<b>Lease Prices<sup>7</sup>:</b>	<b>\$79/mo.</b>	<b>\$100/mo.</b>	<b>\$143/mo.</b>

**For more Compaq Prosignia Server options, visit our website or ask your sales representative.**

**Buy direct from Compaq: [www.directplus.compaq.com](http://www.directplus.compaq.com) or 1-800-888-5807**



# Start growing your business today with a **FREE<sup>4</sup>** trial of our Compaq Online Services.

These easy-to-use, Internet-powered solutions lower the cost of owning technology, save you time, and increase productivity. They bring all the power of the Internet to your growing company. And now you can try them **FREE<sup>4</sup>**.

## **online.commerce**

- Transact business via your Internet storefront in 24 hours or less
- Secure payments via credit card, P.O., or real-time processing
- Automated reports for retrieving sales and order information

## **online.backup**

- No hardware to buy, no expensive IT personnel to hire
- Protects valuable data in a Compaq Class A Internet data site
- Schedule backups to run automatically
- Encrypts and compresses data to ensure security and speed

## **online.briefcase**

- Remote access to all your e-mail, files, contacts, and calendar from any computer on the Internet
- Automatically updates and synchronizes stored information
- Encryption and on-site security ensure privacy

## **online.connectivity**

- Dial-up Internet access with speeds up to 56K<sup>2</sup>
- Up to four e-mail boxes
- Up to 2MB of drive space

## **online.delivery**

- Save time and money with delivery of any file, anywhere, anytime — eliminates faxes, overnight deliveries, and messenger services
- Built-in copyright protection option prevents recipients from forwarding, saving, editing, printing, or capturing screens of files
- Detailed tracking and delivery confirmation

## **online.library**

- Fast access to user tips on Microsoft Windows 98, Microsoft Word 97, Windows NT Workstation 4.0, and other training programs

**Call your sales representative for information about  
our Premier Online Services Bundle with a \$100 lease rebate.\***

**Buy direct from Compaq: [www.directplus.compaq.com](http://www.directplus.compaq.com) or 1-800-888-5807**

<sup>4</sup>**40X Max CD-ROM:** Data transfer rates may vary from 150KB/s to 6000KB/s. <sup>2</sup>**56K Protocol:** Designed to allow faster downloads from 56K compliant digital sources. Maximum achievable download transmission rates currently do not reach 56Kbps and will vary with line conditions. Your modem may only download at the current V.34 standard protocol rates (up to 33.6K) until V.90 ITU standard software upgrade is available. **\*Monitor included in price.** **\*Compaq Online Services:** Free trial requires Internet access capability. **\*Limited Warranty:** Ask for a copy of the limited warranty for any product featured in this catalog or call for details. Certain restrictions and exclusions apply. All warranty periods represent time from initial purchase. Battery packs and certain options are covered by a one-year limited warranty. Standard coverage includes: Compaq Prosignia Desktops 3 years parts, 1st year on-site labor. Warranty service for parts years 2 and 3 is provided via carry-in service. Compaq Prosignia Notebooks 3 years parts and 1 year labor; 48-hour turnaround on mail-in depot repair. If your notebook requires repair while under 1st year of warranty, Compaq will supply packaging, pick up the PC at your location, repair it, and return it to you. For pick-up service, call Compaq Tech Support Center. Warranty service for parts after 1st year is provided via carry-in or mail-in. For carry-in service you may bring the PC in to any authorized Compaq Service Provider. Compaq monitors S700 and S900 — 3 years parts with the 1st year on-site labor. V55 — 1 year on-site labor which covers parts and labor. Compaq 48-Hour Monitor Swap — if your Compaq S700 or S900 monitor needs servicing within the warranty period, you can get a replacement monitor from Compaq within 48 hours of your service call, however pick-up service is not available. Call 1-800-OK COMPAQ if you have a monitor problem. **\*All prices shown are DirectPlus prices and are subject to change, and do not include applicable state and local sales tax or shipping charges.** **\*Leasing:** Leasing available through Compaq Capital Corporation (CCC) to qualified commercial customers in the United States, subject to credit approval and execution of CCC lease documentation. Monthly lease payments are based on 36-month fair market value lease, and do not include taxes, fees, or shipping charges. Offering subject to other restrictions and CCC reserves the right to change, alter, or cancel at any time without notice. **\*Offer valid in U.S. only to end users. Expires 4/30/99.** Limit one per customer and may not be combined with any other offer. Bundle and hardware must be leased at the same time. Proof of purchase must be submitted with rebate coupon. Invoice must show lease of product and Premier Online Services Bundle, date, Compaq hardware serial number, and end user customer name and address. Multiple addresses and P.O. boxes are prohibited. For complete rules, see rebate coupon that comes with lease paperwork. **\*24X Max CD-ROM:** Data transfer rates range from 150KB/s to 3600KB/s. **\*Battery Life:** Actual results may vary with individual usage. When tested in standard configuration, using the Ziff-Oavis Battery Mark Test version 2.0, the battery life of the Prosignia Notebook will range up to 2.5 hours, standard configuration at the time of announcement is considered to be one battery, 1024 x 768 (16-bit color) panel set at 50% brightness, 32MB RAM, and no drives active other than the hard drive. **\*32X Max CD-ROM:** Data transfer rates vary from 150KB/s to 4800KB/s. **\*For hard drives, GB=billion bytes.** **\*Compaq Server Pre-Failure Warranty:** Pre-Failure Warranty is available on all Compaq Prosignia servers using Compaq Insight Manager 2.1 or higher, also covers ECC memory, and server hard drives (except the 535MB Fast-SCSI-2 hard drives) using Compaq IDA, IDA-2, Compaq SMART SCSI Array Controllers, Compaq SMART-2 SCSI Array Controllers, or SMART Array 3100ES Controllers. Products, specifications, and prices are subject to change. Compaq is not liable for pictorial or typographical errors in this catalog. Compaq, the Compaq Logo, Prosignia, Compaq Insight Manager, and SmartStart are registered with the U.S. Patent and Trademark Office. DirectPlus is a registered service mark of Compaq Computer Corporation. MultiBay and PremierSound are trademarks of Compaq Computer Corporation. Microsoft, Windows, and Windows NT are registered trademarks of Microsoft Corporation. Intel, the Intel Inside Logo, Pentium, and Celeron are registered trademarks of Intel Corporation in the U.S. and other countries. Other product names mentioned herein may be trademarks or registered trademarks of their respective companies. © 1998 Compaq Computer Corporation. All Rights Reserved. Printed in the U.S. 12/98

**COMPAQ**  
**DirectPlus**

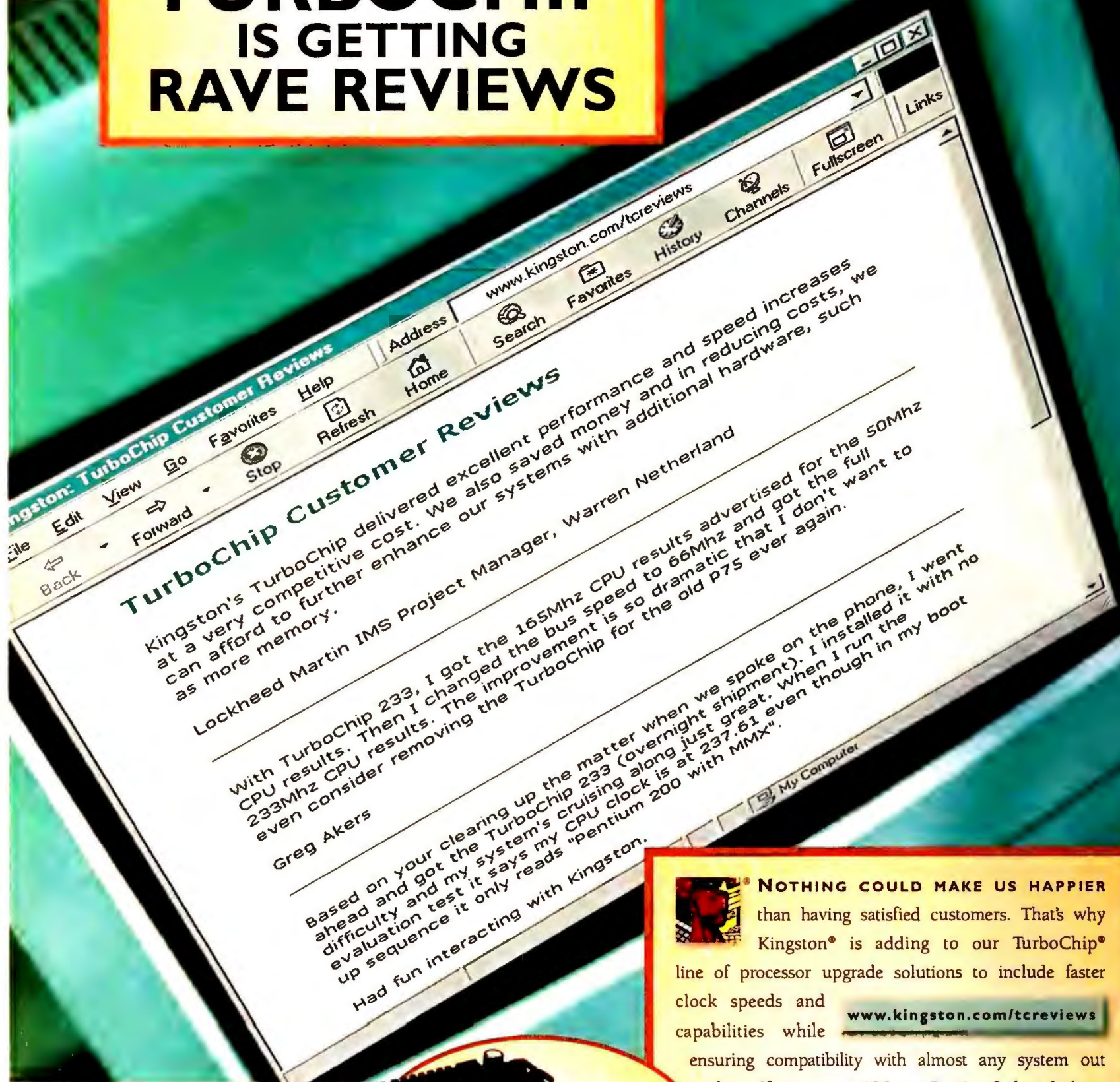




©1998 Compaq Computer Corporation.  
Compaq, the Compaq logo and Prosignia are registered trademarks and  
Better answers is a service mark of Compaq Computer Corporation.



# KINGSTON'S TURBOCHIP IS GETTING RAVE REVIEWS



## NOTHING COULD MAKE US HAPPIER

than having satisfied customers. That's why Kingston® is adding to our TurboChip® line of processor upgrade solutions to include faster clock speeds and capabilities while

[www.kingston.com/tcreviews](http://www.kingston.com/tcreviews)

ensuring compatibility with almost any system out there. If you own a 486 or a Pentium® class desktop or minitower computer, Kingston has the upgrade solution to increase processing speeds and productivity of your existing PC. Check out Kingston's award winning TurboChip processor upgrade solutions at [www.kingston.com/tcreviews](http://www.kingston.com/tcreviews) and give us your TurboChip feedback. Or give us a call at (800) 588-5517 to find out more.

**Kingston**  
TECHNOLOGY  
COMPUTING WITHOUT LIMITS®



Kingston Technology Company, 17600 Newhope Street, Fountain Valley, CA 92708 USA, (714) 435-2600, Fax (714) 435-2699 ©1998 Kingston Technology Company All rights reserved. All trademarks and registered trademarks are the property of their respective owners

Circle 133 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# PICTURE PERFECT



**DON'T GET STUCK  
WITH PHOTOGRAPHS  
YOU HATE. WITH  
ONE OF THESE NINE  
PHOTO EDITORS,  
YOUR IMAGES  
CAN BE JUST THE WAY  
YOU PICTURED THEM.**

**BY JOANNE ROBB**

ILLUSTRATIONS BY PAMELA HOBBS



ALMOST EVERY PHOTOGRAPH can benefit from a quick fix. If your company's CEO has bags under his eyes, you can make him look more alert before you pop his image onto the Web site. If an overexposed photograph makes your home's paint job appear washed out, you can tweak its brightness before you print the real estate brochure.

Thanks to photo-editing software, you don't have to hire a graphic designer to make simple changes to a photo; now you can fine-tune images to your liking. But the range of features each tool offers (and the quality of the finished product) can vary widely, and there's no fair way to compare the simplest applications with office-oriented tools. So we looked at nine programs—from basic packages designed for non-graphics pros who occasionally need to touch up digital photos, to high-end designer tools with additional features that cost far more—and we awarded two Best Buys: one for the top basic-level tool, and another for the program that offers practically every feature an intermediate user would want, for a great price.

Each application underwent the same testing. Here we categorize each program by how well it performed the tests, how much hand-holding it does, and how



## OUR BEST BUYS



FOR BASIC IMAGE EDITING, we recommend Microsoft's \$49 Picture It! 99. Its numerous how-to wizards not only assist in the completion of tasks but also educate users about the process of basic photo editing. Picture It's bargain-basement price and ease of use compensate for its inability to perform some tasks in our advanced tests.

Intermediate users willing to trade hand-holding wizards for finer control will appreciate the \$79 Paint Shop Pro 5 application from Jasc. This useful tool easily completed all our tests, and it offers the intermediate user a wide variety of design features that go well beyond simple photo cleanup.

much control it offers. We classify seven products as basic-level tools: They offer a simple, friendly interface and wizards to guide users through a touch-up process, but they may not be able to perform some tasks. The other two—Jasc's Paint Shop Pro 5 and Ulead's PhotoImpact 4.2—are intermediate packages; they're designed for experienced image manipulators who would rather have a finer level of manual control than wizard-based automation.

If you need (and can afford) more than these packages provide, take a look at "Kings of the Hill: Pro-Level Tools" on page 174 for evaluations of three advanced utilities that are appropriate for graphic designers.

## CHEAP DOESN'T EQUAL EASY

THE GOOD NEWS FOR small-office and home-office users: None of the programs we evaluated will set you back more than 100 bucks. Adobe PhotoDeluxe Business Edition and Ulead's PhotoImpact 4.2 top the price list at \$99 and \$100, respectively. At the low end, The Learning Company's PhotoFinish 4.1, which costs a mere \$40, is the cheapest of the bunch.

But price is a poor indicator of a tool's abilities. The \$49 Picture It! 99 earns a Best Buy, while MetaCreations' \$44 Kai's Photo Soap is one of the toughest programs to use. Photo Soap's deceptively beautiful interface can (initially) distract you from the fact that most of its slider controls have no identifying text or tool tips; finding the desired control involves a lot of trial-and-error. (MetaCreations says that an upgrade to fix some of Photo Soap's deficiencies should be available soon after you read this.)

Adobe PhotoDeluxe is a remarkably versatile tool for basic photo editing that also

## PHOTO-EDITING SOFTWARE

## FEATURES COMPARISON

PHOTO EDITOR	Street price (11/23/98)	Comments	Overall usability	Beginning tasks	Intermediate tasks	Advanced tasks	Hard disk space required (MB)	PC World InfoNet number
Adobe PhotoDeluxe Business Edition 800/833-6687 www.adobe.com	\$99	Project-oriented templates and rich feature set; counterintuitive interface.	good	good	very good	good	16	750
Corel Photo House 2.1 <sup>3</sup> 800/772-6735 www.corel.com	\$69	Better at advanced tasks than basic ones; suite includes templates.	very good	fair	good	very good	26 <sup>4</sup>	751
Jasc Paint Shop Pro 5 800/622-2793 www.jasc.com	\$79	Excellent program performed every task well; solid documentation.	very good	excellent	very good	very good	32	752
The Learning Company PhotoFinish 4.1 800/716-8506 www.learningco.com	\$40	Fairly good performance, but needs a better manual and better online help.	very good	good	good	good	10	753
LivePix LivePix Soho 800/724-7900 www.livepix.com	\$50	Missing some key functions, like the ability to convert an image to a GIF file.	good	good	fair	fair	45	754
MetaCreations Kai's Photo Soap 800/846-0111 www.metacreations.com	\$44	Though its unique interface is beautiful, Kai's tool proves much too difficult.	poor	fair	good	fair	20	755
MGI PhotoSuite 8.0 888/644-7638 www.mgisoft.com	\$49	Easily completes many tasks, but it's tougher than most to use.	fair	very good	fair	good	32	756
Microsoft Picture It! 99 800/426-9400 www.microsoft.com	\$49	Full-featured tool for beginners; doesn't perform high-level tasks equally well.	excellent	very good	very good	fair	90	757
Ulead PhotoImpact 4.2 800/858-5323 www.ulead.com	\$100	Package offers many features but could use better help.	very good	very good	excellent	very good	120	758



Best Buy

<sup>1</sup> For full installation.

<sup>2</sup> For more information about all products in this article, select PC World InfoNet no. 911, or visit [www.pcworld.com/infonet](http://www.pcworld.com/infonet).

<sup>3</sup> Part of Corel Print Office.

<sup>4</sup> Entire suite requires 62MB.



contains a significant amount of built-in wizard assistance. The package is relatively expensive at \$99, but PhotoDeluxe handily completed our range of basic and intermediate tasks, and it also includes templates that allow you to tackle common design projects like creating business cards and brochures.

But despite Adobe's years as the leading maker of photo-editing software, we found that unless you rely heavily on its wizards, PhotoDeluxe is not very easy to use. Most of its powerful tools are fairly

## Casual Cleanups

FOR THE BASIC category, we evaluated how well each application performed a series of basic tasks on an image:

- adjusting brightness and contrast
- adjusting color saturation
- flipping an image along its horizontal axis to make a mirror image
- sharpening out-of-focus elements
- trimming an element out of the picture (making cutouts)
- converting a JPEG file to GIF format



**MONET'S MIATA?** With Microsoft's Picture It 99, you can add special effects (like this pointillist illusion) to make photos distinctive. Most programs we tested have similar effects.

well hidden within layers of menus. On the other hand, Jasc's \$79 Paint Shop Pro 5 includes comprehensive documentation that shows you how to get to every tool. And Microsoft's Picture It 99 uses a practically idiotproof interface to point you to tools that are every bit as full featured as those in PhotoDeluxe. Other basic-level products made certain tasks easier, but Picture It performed consistently well in all our tests—and it costs about half as much as PhotoDeluxe.

Adobe's product is one of several moderately priced applications that can perform more-advanced tasks. Corel's Photo House 2.1, Jasc's Paint Shop Pro 5, and Ulead's PhotoImpact 4.2 also give you freedom to grow. The Best Buy contest in the intermediate category was a fairly close call between Paint Shop Pro and PhotoImpact. A superior manual and somewhat better price earn Paint Shop Pro the intermediate user's Best Buy. PhotoImpact follows closely behind.

Nearly every package we tested can finish simple tasks like these, though our tests show significant differences in the ability of basic-level programs to perform even the most elementary jobs. Jasc's Paint Shop Pro 5, our intermediate Best Buy, did the finest job, but among basic tools, Picture It did best consistently.

All the programs offer some level of automatic picture adjustment, but we found that most automated processes produced images that looked worse than the original. The automatic tool in Picture It yielded washed-out images, but you can customize its changes with sliders.

Jasc's Paint Shop Pro 5,

MGI's PhotoSuite 8.0, and Ulead's PhotoImpact 4.2 all provide one feature we like—a thumbnail-image preview of your changes shown alongside the original image. By comparing pre- and post-change images side by side before you adopt the change, you can decide whether the modifications you're making to the image are excessive. Surprisingly, this convenient before-and-after comparison isn't a standard feature among low-end photo-editing tools. Picture It, for example, shows you a preview of the post-change photo but doesn't display the original.

All nine programs make short work of flipping the image horizontally. But PhotoDeluxe complicates the process a bit by placing its Flip Horizontal option in the ominous-sounding Advanced Tools section. And if you want to rotate a photo, you also have to root around in Advanced Tools instead of using PhotoDeluxe's intuitive Size/Orientation tool. Organizing basic tasks like these in the Advanced Tools category might discourage some beginners from trying them.

### SHARPEN AND TRIM AND TRANSLATE-OH MY!

MOST PACKAGES' tools couldn't sharpen a specific area of a photo—they could only modify the entire image. Unfortunately, sharpening the whole photo often worsened the overall visual effect, by giving ➤

## HOW WE TESTED IMAGE EDITORS

TO PUT EACH OF THE PROGRAMS through its paces, we shot task-specific digital photos with an Olympus D-500L digital camera set at 1024 by 768 pixels, the camera's

highest possible resolution.

Our first series of tasks consisted of common jobs like adjusting the contrast and brightness of an image, and creating a mirror image. Our basic tests used a digital photo of a woman, taken in bright sunlight in front of a plain white wall. Intermediate tasks involved



touching up blemishes in a photo of a car, and adding text along the bottom to create a for-sale flyer. Advanced tasks included removing the image of a palm frond from a photo of a building, pasting a resized cutout image of the woman from the first photo so she appears in front of the same building, blending the images together, and then optimizing the photo for Web publishing.





**FAMILY RESEMBLANCE:** We sharpened this image with Adobe's PhotoDeluxe (left) and Photoshop. PhotoDeluxe made the image look grainier and rougher than its more costly cousin did.

the image a rough, grainy character. Post-op pictures sometimes looked as if they had been rubbed against a stucco wall.

But that wasn't the case with either of our Best Buys. Picture It can sharpen images beyond the recommended range, but it doesn't make the whole image grainy—instead it leaves a hard, dark line around objects. Paint Shop Pro's sharpening tool works like a dream: Finished images look crisp, even when subjected to the highest sharpening setting.

Of the basic assignments we gave these programs, the task of performing cutouts proved the most challenging. Among lower-price programs, only MGI PhotoSuite and Picture It made managing cutouts easy: As you move the cursor around the image you want to cut out, the program deduces where you'll likely cut the image, and places an outline accordingly.

Paint Shop Pro includes a Smart Edge tool that automatically molds itself to the outline of a figure as you click around it. (Higher-end products like Micrografx Picture Publisher and Adobe Photoshop 5 offer similar features; for more information, see "Kings of the Hill: Pro-Level Tools." In Photoshop's supremely simple solution, you just move your cursor around the figure—without clicking—and the program calculates the edge.)

The remaining tools use one of two cutout methods. With the "anchor" method, featured in LivePix Soho, Paint Shop Pro, PhotoDeluxe, and PhotoImpact, you click at points around the edge of the image, and the program adds adjustable anchors

that let you create a clean, fine-tuned outline. A less-appealing method has you select a lasso (or outline) tool and then precisely drag a line around the object—a tedious, near-impossible mousing task with all but the most basic shapes.

Converting our test image into a GIF file tended to be a more straightforward task. GIF images are blessedly small, thanks to a relatively small palette of colors, and therefore load quickly, making the format a favorite of Web producers. Most programs handle this job exactly as we expected: Using the *Save As* menu item, you pick the file type you want from a list.

Some programs have features dedicated to fine-tuning files in a specific format. For example, PhotoImpact's Web Smart-Saver converts files to GIF and other Web-based formats, and allows for all kinds of



**SEE THE FUTURE?** Previews let you see the results of your changes—alongside the original photo—before you apply them.

## HOW MUCH PHOTO EDITOR DO YOU NEED?

IF YOU...	YOU NEED...
need to perform minor touch-ups to photos, or want a tool that has templates for work projects like business cards	a simple program like Microsoft Picture It 99, Adobe PhotoDeluxe Business Edition, or Corel Photo House 2.1.
want a photo-editing tool that offers extensive control and functionality but doesn't require you to take a class to learn it	an intermediate program like Jasc Paint Shop Pro 5.
dream of artistic creation but have a limited budget to work with	a less-costly advanced program like Micrografx Picture Publisher 8.
have the eye of an artist and the wallet of a Rockefeller, or plan to create or edit high-end photos and graphic art	a super-advanced program like Adobe Photoshop 5.0.

important color and file adjustments.

A few programs make file conversion unnecessarily difficult. Saving a GIF file in Corel Photo House 2.1 requires you to drop the color palette manually down to 256 colors using Print Office (another program in the Corel suite); most programs perform this task automatically. If you need to do more editing, you have to reopen the image in Photo House—an annoying detour that Corel says will be unnecessary in the next version of the product, due out by the time you read this. And Metacreation's Kai's Photo Soap can't make the conversion at all without special plug-in software (MetaCreations says the capability will be integrated into an upcoming version).



# Midrange Magic

OUR INTERMEDIATE-LEVEL touch-ups centered on a picture of a red sports car. Our test—preparing a for-sale ad flyer—required two steps:

- removing visible evidence of the car's dings, dents, and scratches
- adding attractive "For Sale" text across the bottom of the photo

Though neither of these tasks is terribly complex, both take more photo-editing firepower than you might suppose. Most of the programs were equal to the occasion, but some offer the user substantially more control than others. Ulead's PhotoImpact took the crown in this category of tests.

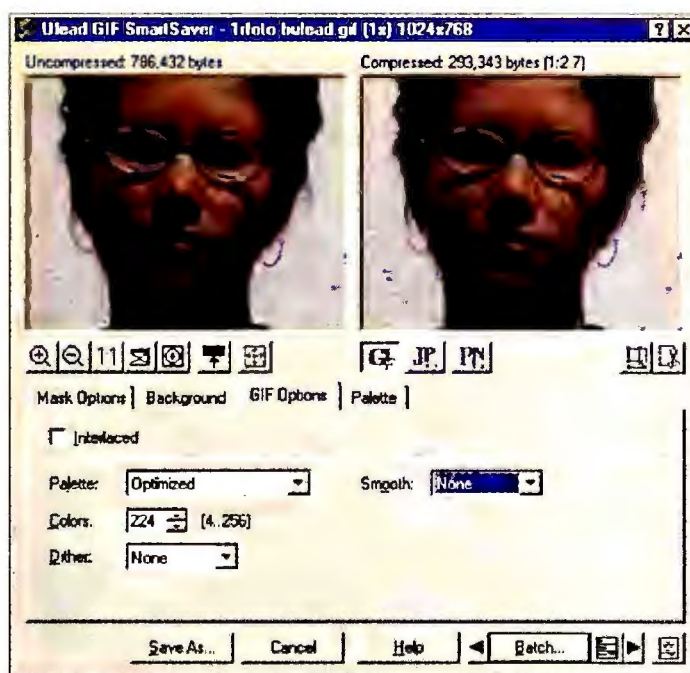
## PAINT MAGIC

EVER TRY MATCHING PAINT in real life? You think you've selected the right hue only to discover after it dries that it's just a shade off. Well, it's exponentially harder to match colors in a photo, mainly because there isn't just one color. The red of our test image's car, for example, actually consists of thousands of different shades that commingle on its surface, making it hard to select one color for fixes.

Fortunately, all the programs we looked at come with robust tools for repairing scratches on your photographs. Some packages, such as PhotoSuite and Photo



**ANCHORED HEAD:** LivePix Soho's anchor points define a cutout. Even if your outline isn't perfect, you can just drag the anchors around until they're in position.



**BRAINY DIALOG:** PhotoImpact's helpful SmartSaver helps optimize and compress GIF files for the Internet.

House, can correct scratches and dents automatically, but manual tweaking produced better-looking results (as it did with their automatic contrast and brightness wizards). The custom tools fall into two general categories: touch-up and cloning.

The touch-up tools allow you to choose a shade from somewhere on the photo—generally using an "eyedropper"—and then select another tool (such as a paintbrush) to place a droplet of that color in the right location. But unless the color that you designate with the eyedropper matches the surrounding area exactly, the repair will look like a large block of the same color—and be obvious to the eye. A smudge tool often works better on the more uniform areas of an image than the eyedropper does. Rather than selecting a specific color first, you use a smudge tool to wipe across the area you want to fix with a color from an adjacent part of the image, as if you were applying a damp sponge.

Paint Shop Pro's unique smudge tool lets you smudge with any color, whether it's adjacent or not, giving you increased control; most of the other utilities just pull the color from the pixels that surround the smudged area. And if you want to use

the color that's right next to a fix-it spot in Paint Shop Pro, you can always select a pixel of color from the surrounding area with the eyedropper tool.

## CLONING AROUND

CLONING TOOLS let you select one section of a photo and copy it to other sections—a particularly handy option when a fix requires a range or gradation of colors. All cloning tools operate in much the same way: You set the cloning origin location, then paint a clone of that area in the destination. In our tests, we selected a part of the car that roughly matched the area

near the scratch, cloned it, and painted the clone over the scratch. The best cloning tools—such as those in PhotoFinish, Paint Shop Pro, and PhotoImpact—allow you to change the size and shape of your brush to make detailed repairs.



**TOUCH-UP TRICKERY:** Picture Publisher lets you select a color from the image to touch up the digital paint job. But you may have some explaining to do when the buyer sees the real thing.

Some programs' touch-up tools are irksome. PhotoDeluxe, for example, requires you to navigate interminable menus to make each individual fix. LivePix Soho's troublesome cloning tool didn't always work as we expected: Sometimes the original cloned area maintained the proper relative distance from the destination, but often (and unpredictably) it would zoom off in a different direction, painting a black patch on our image's red car. ➤





**MIND-BLOWING 128-BIT**



**WINNER OF  
OVER 45 AWARDS  
[www.NVIDIA.com](http://www.NVIDIA.com)**

**THE RIVA TNT: WORLD'S FASTEST 3D PROCESSOR.\***



Hold onto your armrests...you're not going to believe your eyes. The new RIVA TNT graphics processor delivers the most stunning, realistic graphics ever seen on a personal computer screen.

The RIVA TNT's 32-bit color Twin Texel pipeline with support for 16 Megabytes of frame buffer dares 3D applications to run at an unheard of 1600x1200 resolution. RIVA TNT also delivers explosive 2D for your business applications, like Photoshop.

The RIVA TNT is the first 3D processor to provide hardware support for Microsoft's new DX6 API, as well as full OpenGL support for professional applications on the Windows platform of your choice. It's available only from the best graphics card suppliers in the world such as Diamond, STB, Creative Labs, Elsa, and Canopus. And from leading PC companies such as Dell, Gateway, Compaq, Micron, NEC and Fujitsu.

Whether you are running one of the many new graphics-rich business applications, or playing the hottest new games, the RIVA TNT will blow you away. But don't just take our word for it. Head to our website at [www.NVIDIA.com](http://www.NVIDIA.com) and we'll link you to those who have experienced the RIVA TNT firsthand. Then brace yourself; 'cuz this baby will blow the 3D market sky high.

**Circle 216 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)**

\*Mercury Research Data 11/16/98  
©Copyright 1998 NVIDIA Corporation. NVIDIA, the NVIDIA logo, RIVA TNT and Bringing 3D to the World are trademarks of NVIDIA Corporation. All other names are registered trademarks of their respective companies. All rights reserved.

**GRAPHICS.**



**NVIDIA™**

**BRINGING 3D TO THE WORLD™**



The jury's still out on the superiority of cloning versus touch-up. Picture It includes two kinds of touch-up tools that, when used in combination, cleaned up our image with ease. The program's automatic touch-up function allows you to attempt a patch simply by clicking on the area that you want to fix; the program then estimates a correction. This feature makes acceptable fixes over large areas,

but it encounters problems when it undertakes smaller types of touch-ups. For these more-exacting repairs, the Remove Scratch tool enables you to draw fine lines over parts of the image.

Nearly all of the programs include straightforward text tools: Click on the text button; enter your message; change the font style, size, and color; and voilà!—you're done. Some of the packages, how-

ever, present additional hurdles and oddities. In PhotoSuite, for example, you can't create text in the same window where you edit your photos; you have to make the change in the Project window—an unnecessary inconvenience. And you can't change the color of text in Paint Shop Pro once it has been added to the image. So choose wisely: If you pick the wrong text color, there's no going back.

## KINGS OF THE HILL: PRO-LEVEL TOOLS

BESIDES EVALUATING tools that specifically target small-office and home-office users, we looked at three photo-editing and design applications intended for use by graphics professionals. Adobe Photoshop 5.0, Corel's Photo-Paint 8, and Micrografx's Picture Publisher 8 all work hard to woo design pros and technically adept hobbyists.

So what's the big difference between these Olympian rivals and their reasonably priced cousins? Not surprisingly, with advanced tools, ease of use often falls by the wayside. The pro applications offer several layers of menus that amount to literally hundreds of options. And while these packages permit an impressive number of adjustments, the programs seemed confusingly complex: Even when we were sure a photo editor could perform a specific function, we couldn't always figure out how to activate the feature. These packages also require a more solid understanding of the technical aspects of digital imaging and image editing.

If you plan to create high-end art and photographic images, Adobe Photoshop emerges as the clear winner in the features race. Even though we tested a relatively narrow range of photo-editing capabilities, it became clear that this package offers great depth: Leonardo would have been satisfied with the fine-tuning and tinkering it makes possible.

Even our most advanced photo-editing tasks didn't scratch the surface of the pro tools' capabilities: All three offer high-level image design functions, as well as features for touching up and manipulating pictures. But to compare these high-priced marvels of technology with their country cousins, we put them through the same trials.

### SKIMMING THE BASICS

THE ADVANCED TOOLS sailed along where some SOHO tools could only dog-paddle. Every product we tested performed our basic tests, but Photoshop earned the best overall score here, including a perfect rating for its sharpening tool. Photoshop also has some automatic tools, but the custom tool is all you'll need. It brought our test image into focus without making it look too sharp or pixelated (photo-editing neophytes may find themselves clutching the manual as they

ting the target area proves more difficult than with the other programs. Picture Publisher lacks a feather feature, though you can simulate a degree of blur around the edge of the image by using a camera-aperture effect.

### PRO PHOTO TWEAKING

ALL THREE UTILITIES completed the advanced tasks, but with varying degrees of ease. Both Photo-Paint and Photoshop offer a vignette effect similar to Picture It's soft-edge finish. Photo-Paint lets you change the shape of the border—to add an elliptical effect to a rectangular photo, for example. Picture Publisher offers somewhat less control over the final product but managed to produce a similar image in our testing.

### TIME EXPOSED

IF YOU DECIDE to invest in a high-end photo editor, prepare yourself for an enormous hit to the wallet. Photoshop will set you back at least \$650. And though Corel's and Micrografx's applications are less pricey, all three present a steeper learning curve than you'd experience with the other tools we tested. Don't expect to use any of these advanced programs effectively

without training; more often than not, finishing a job requires a lot of know-how.

• **Adobe Photoshop 5;** street price \$650; 800/492-3623; [www.adobe.com](http://www.adobe.com)

PC WORLD INFONET NO. 747

• **Corel Photo-Paint 8;** street price \$329; 800/772-6735; [www.corel.com](http://www.corel.com)

PC WORLD INFONET NO. 748

• **Micrografx Picture Publisher 8;** street price \$150; 800/733-3729; [www.micrografx.com](http://www.micrografx.com)

PC WORLD INFONET NO. 749



make adjustments). One nuisance we noticed: Neither Photo-Paint nor Photoshop can save a photo as a GIF file until the program converts the image to an 8-bit color file, a task most other photo editors handle automatically.

### MASTERS OF MANIPULATION

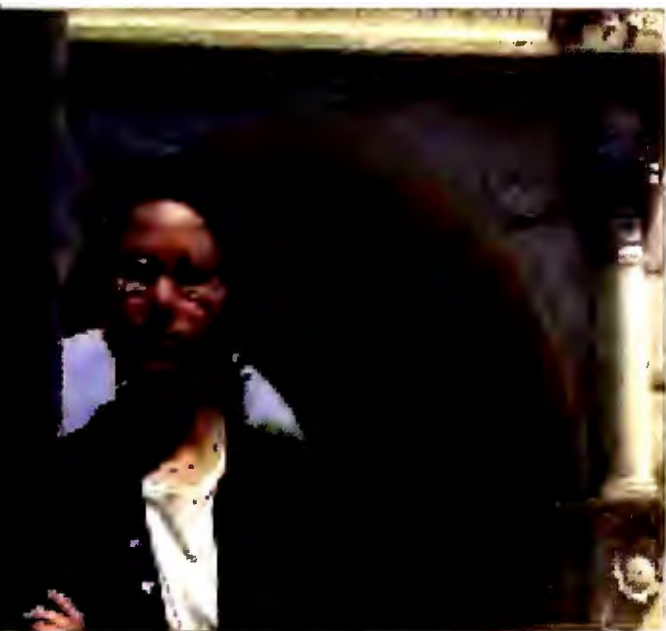
PHOTOSHOP AND Picture Publisher offer better cloning tools than our basic Best Buys; Photo-Paint, however, doesn't fare as well. Its clone tool appears straightforward, but reset-



# Advanced Projects

OUR ADVANCED TEST involved creating a photomontage of a woman in front of a building. Though no program won hands-down, Paint Shop Pro and PhotoImpact did the best job with the advanced tasks:

- removing a palm frond that obstructed the view of the building's clock tower
- using darkening and lightening tools to alter areas of the photo
- adding and resizing the image cut from another photo
- feathering the background of the image to create a sense of depth
- reducing the number of colors in a GIF image, permitting a smaller file
- altering the compression settings of the photo and saving in JPEG format



**TEXTURE TRICK:** To bring out some detail from the shadows, we used Paint Shop Pro's texture tool and painted the underside of the arch with large bricks.

## LEAF BURNING, ARCH DODGING

REMOVING THE palm frond from our test image required tools and techniques similar to those we used to erase the dings in the car photo, but this task relied more heavily on cloning tools. The toughest part involved removing a blade of the palm frond that partly blocked the clock tower. Most of the frond hung against clear blue sky and was relatively easy to clean up.

But some of the leaf dangled in front of the building itself, blocking part of a narrow wrought-iron railing—a dramatically more complicated removal. Luckily, most of the cloning tools were up to the task, as long as we handled them with sufficient caution and precision. Picture It faltered a bit on this job: It cloned the leaf out of

the picture, but it also altered the surrounding sky, which ended up a shade lighter than it should have been.

Darkening or lightening specific areas of the photo proved significantly more difficult for most of the programs. Neither

LivePix Soho nor PhotoDeluxe was able to accomplish this task at all, though the other basic-level programs provided some way to lighten (dodge) or darken (burn) sections of an image. But our photo test required us to lighten the excessively shadowed archway of the building we photographed. None of the available methods were simple. In Photo House, for example, we selected the eraser tool and adjusted transparency settings so as not to erase too much color.

Paint Shop Pro has the best dodge tool of the bunch. In most of the other programs, adding light under the archway caused the whole area to appear smudged. But Paint Shop Pro lets you add light over a texture, much like making a rubbing of a name from a monument. We decided on the large-brick option as the image's texture—it's one of several dozen textures available in the Jasc package—and gave the building a realistic stone-block appearance.

With the exception of Kai's Photo Soap, every one of the programs capably added the cutout figure to the new image, but again with differing degrees of difficulty. Professional-level tools like Photoshop let you manipulate the edges of dropped-in images to help them blend more realistically with the background. Of the basic- and intermediate-level packages we examined, only PhotoSuite offers capabilities comparable to Photoshop's.

Our next task was to feather the background of the image—adding a textured edge so that the image would appear to have a border and some additional depth. The applications provided some interesting (and surprising) options for achiev-

ing the desired look. LivePix, Picture It, and Photo House are limited to creating a soft edge around the entire image, imparting the appearance of an old-fashioned vignette photo. Other programs approximate a real feathering effect: Kai's ▶



**GOOD, BAD, AND UGLY TOUCH-UPS:** Presented with a photo marred by an intrusive palm frond (top), Picture It fared poorly, leaving blocks of color in the sky and on the tower wall (middle). But Corel Photo House made the photo look almost as if the leaf had never existed.



Photo Soap, for example, includes a frame that adds a smoky black edge; and PhotoImpact offers a series of frames that have different border options.

Three of the programs we looked at offer less-than-impressive feathering tools. PhotoFinish's effect simply didn't work at all, and PhotoSuite's process proved to be unnecessarily complex. The procedure consists of a frustrating four-step process. First you have to jump from the photo section of the program to the project section; next you're required to pull up a frame, add the frame, and finally send the rest of the photo behind the frame. Since a frame is essentially just the area surrounding the outer edge of an image, the designers of PhotoSuite could have programmed the frame so that it automatically sat on top of the image.

Even the versatile Paint Shop Pro photo editor could not easily create a feathered effect—a rather glaring weakness in this otherwise solid and straightforward program. Paint Shop Pro's convoluted, tiring process forces you first to painstakingly create a transparent feathered effect and

then to choose a foreground color in order for the effect to appear on the image.

## WORKING THE WEB

THE FINAL TWO TASKS of our test suite required the programs to optimize the color palette in a GIF file and change JPEG compression settings—both impor-

though, this strictly-for-business tool lurks under the Fun Effects menu in Photo House. The precise tools in PhotoImpact enable you to specify the exact number of colors needed for optimum viewing. Although it includes a number of other high-level functions, Paint Shop Pro lacks palette optimization features.



**BEYOND THE FRINGE:** Adobe Photoshop (left) successfully masks the fringe effect, which in the LivePix Soho image gives our model the cutout quality of a paper doll. The white border in the LivePix picture is the giveaway.

tant capabilities for Web publishing.

Only three of the programs that we review here—Paint Shop Pro, Photo House, and PhotoImpact—provide users with a way to optimize color palettes. Oddly,

Almost all the programs we looked at for this article let users tinker with JPEG compression and quality ratios. The exception is Picture It, which saves files in JPEG format but lacks custom settings.



## TINKER TOOLS

OF THE DOZEN programs we tested, only Kai's Photo Soap is a one-trick pony—it only lets you touch up your photos, nothing more (and it doesn't even do that very well). The rest of the programs offer extra features ripe for the picking. Cool effects filters can change the entire look of your photo, giving it the appearance of an impressionist landscape, say, or dripping wet paint. Other tools can make your photo appear to be composed of a mosaic of smaller images, sketched in charcoal, or drawn on a wad of just-uncrumpled paper. Micrografx's Picture Publisher 8 stands out in the special effects ranks; its Effects Browser generates thumbnails of multiple effects in one window.

Advanced programs allow impressive control over effects. If you want to create a mosaic effect using Adobe Photoshop 5, for example, you can change not only the size of the tiles, but also the color and thickness of the grouting between them. But simple editing applications have some nifty extras as well. They include task-oriented project templates, notably lacking in the more-advanced programs. For example, Picture It offers templates for flyers and business cards and lets you mat your pictures, much as a frame shop would. Similarly, LivePix Soho, MGI PhotoSuite 8.0, Adobe PhotoDeluxe Business Edition, and Corel Photo House 2.1 feature business-oriented templates, generate on-the-fly slide shows, and can store images in searchable albums (which are useful for archives of related images).

## CLOSING THE SHUTTER

MOST BASIC photo-editing programs handle the common tasks adequately. You can avoid the complexity and higher price of an advanced photo-editing application by sticking with tools that focus specifically on the jobs that most home or small-office users perform: adjusting contrast and color, and cropping images. These tasks demand only a basic-level program, especially if you lack an artist's ability.

But if you seek more control, invest in an intermediate-level photo editor. The affordable Paint Shop Pro can perform most standard business tasks well. On the other hand, if you're resolutely determined to use Photoshop for every job, prepare to spend a lot of money—and a lot of time—learning to use its high-end features.

*JoAnne Robb is a freelance writer and editor based in Oakland, California.*



Creating  
**the Live! experience.**

Live the experience!

awesome  
**AUDIO**



explosive  
**GRAPHICS**



thrilling  
**PC DVD**



sensational  
**SPEAKERS**



**CREATIVE**

WWW.SOUNDBLASTER.COM



# We're unleashing a revolution



*You'll be captivated!*



on in audio.

# Sound BLASTER

# Live!

**S**ound Blaster® Live!™ changes everything you know about audio. We will surround you with an Environmental Audio™ sound experience so amazingly real, it has to be Live! Create new experiences with a wealth of breakthrough



**Environmental  
Audio™**  
by CREATIVE®

### *So Real It Has To Be Live!*

technology. Modify any sound source in real-time using amazing audio special effects like flanger, pitch shifter, echo, and distortion. Record and playback crystal-clear audio using the included digital inputs and outputs. Hear audio with more clarity and vibrance than you've ever heard before with hardware accelerated audio streams and multiple speaker support. Experience the ultimate in gaming with Environmental Audio™ support in the coolest new games. Not only will Sound Blaster® Live!™ make your existing games and legacy audio sound clearer, it will be like hearing them for the first time. It's the audio thrill of a lifetime.

To maximize your true surround-sound experience, add the Cambridge SoundWorks® PCWorks FourPointSurround™ speaker system. It uses four discrete amplified speakers and a separate powered subwoofer to produce effective surround audio — regardless of room acoustics, player head position, or speaker placement. Now you can experience truly immersive 3D audio on your PC.

C A M B R I D G E®  
**SOUNDWORKS**



PCWorks FourPointSurround

#### Sound Blaster® Live!™ features:

- > Hollywood-quality re-creation with an astounding -120dB noise floor
- > E-mu®'s most powerful audio processor with 1,000+MIPS and 8-point interpolation
- > Digital I/O card for easy connection to music keyboards and digital audio recorders
- > Environmental Audio™ enhances all audio content from the past, present, and future
- > The Live!Ware program provides upgrades over life of product
- > Hundreds of cool new and upcoming titles with Environmental Audio™ support

#### Cambridge SoundWorks® PCWorks FourPointSurround™ features:

- > Four compact satellite speakers and a powered subwoofer
- > Rear surround speakers can be placed anywhere with the included tripod stands and wall mounting accessories
- > In-line master volume control for all four satellite speakers and subwoofer
- > Delivers discrete 4-channel surround audio with Microsoft® DirectSound®3D and Creative's Environmental Audio™ supported games

*"With the ability to do real-time effects, a bevy of digital connectors, and budding support for EAX™, the Live! is a winner..."*

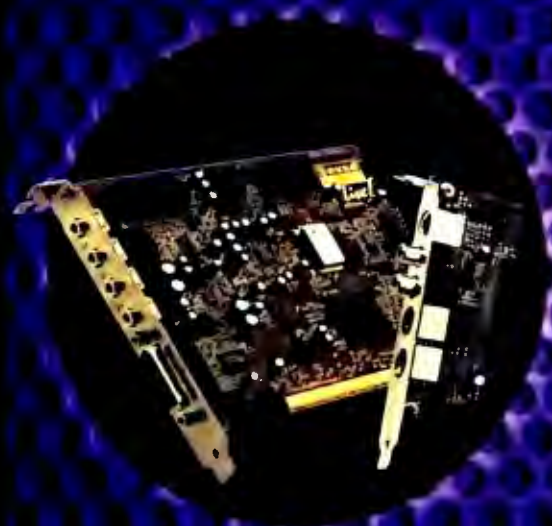
— Maximum PC, October 1998  
Maximum PC Verdict 10



*"Sound quality that's nearly impossible to match at this price..."*

*Possibly the best buy in PC audio."*

— PC Gamer, October 1998  
PCWorks™ FourPointSurround™



Sound Blaster® Live!™ — the most powerful sound card ever!

[www.soundblaster.com/experience/](http://www.soundblaster.com/experience/)

**the Live! experience.**



# We're taking you to the edge



## *You'll be glued to your seat!*



# ge of the universe.

# 3D BLASTER

## Banshee

**B**uckle up and brace yourself for the visual ride of your life! 3D Blaster® Banshee explodes with rocket-fast 2D performance, startling 3D frame rates, and break-neck video acceleration with an absolutely out-of-this-world price.



Its screaming speed comes from the 128-bit 3Dfx Voodoo Banshee™ processor, which includes a 3D engine based on the Voodoo2™. A full 16MB of 100MHz synchronous memory and a 250MHz RAMDAC give you ultra-high resolution and millions of colors. With DirectX®, Glide®, and

3Dfx OpenGL® drivers, tuned for compatibility with the widest range of applications and games, this affordable, easy-to-install graphics accelerator is a must for every PC. It's a gamer's dream come true and it doesn't break the bank!

Graphics Blaster® RIVA TNT™ delivers blood-curdling performance. It's packed with workstation power whether you're a hard-core gamer or a hot-shot 3D designer. An ultra-wide, 128-bit memory architecture synchronous memory supported by a Twin-Texel, 32-bit color 2D/3D engine that has all the toys: bump mapping, multiple texturing, and even full-scene anti-aliasing. Whether you need to work with incredible precision or play games with liquid-smooth speed, Graphics Blaster® RIVA TNT™ is what you've been waiting for.



### 3D Blaster® Banshee features:

- > Complete 2D/3D graphics solution based on the new Voodoo Banshee™ chipset from 3Dfx Interactive®
- > Features a full 128-bit graphics engine and Voodoo2™ 3D rendering technology
- > 16MB of SDRAM and 250MHz DAC deliver awe-inspiring resolutions, rock-solid refresh rates, and stunning visual quality
- > Boosts your PC's performance and provides compatibility with the widest range of applications and games in a single, cost effective upgrade

### Graphics Blaster® RIVA TNT™ features:

- > World-class 2D/3D, and video acceleration using the RIVA TNT™ processor from nVIDIA®
- > Ultra-wide, high speed 128-bit memory architecture and Twin-Texel 3D pipeline deliver mind-numbing speed in virtually any application
- > 16MB 125MHz synchronous memory and a powerful 250MHz DAC provide incredibly high resolutions and refresh rates for brilliant, vivid images
- > Perfect platform for the power-user, gamer or graphic designer

[www.soundblaster.com/experience/](http://www.soundblaster.com/experience/)



*"It's our Editors' Choice for 3-D enthusiasts."*

— PC Magazine, December 1998  
Graphics Blaster® RIVA TNT™



*"After mercilessly putting our 3D Blaster through its paces, we can happily and heartily recommend it."*

— PC Gamer, May 1998  
3D Blaster® Voodoo2™



Our graphics line-up utilizes the hottest chipsets available!

**the Live! experience.**







tion.

# PC-DVD™

## ENCORE 5X

With Dxr™2

A heart-pounding cinematic experience is no longer restricted to the big screen! Building on the award-winning success of Creative's PC-DVD™ products, PC-DVD™ Encore 5X brings the digital difference right to your home. Complete with DynamicXtended Resolution™ (Dxr™2) Technology enhanced resolution capabilities, and Dolby® Digital audio for stunning picture and sound, PC-DVD™ Encore 5X will knock you off your feet! Movie playback is just the beginning. PC-DVD™ also runs all your cool CDs. And it can access up to 17GB of information on a DVD-ROM.



To ensure the ultimate live experience, simply add Cambridge SoundWorks® DeskTop Theater™ 5.1 speaker system.

Now you can experience truly explosive movie theater Dolby® Digital surround sound with five independent speakers and a subwoofer without the high cost of a Dolby® Digital receiver. Like any great film, words hardly do justice to the PC-DVD™ Encore 5X and the DeskTop Theater™ 5.1 speaker system.

CAMBRIDGE®  
SOUNDWORKS®



DeskTop Theater™ 5.1

#### PC-DVD™ Encore 5X features:

- > DVD player for your TV - The Dxr™2 board comes with high-quality S-video and composite outputs to connect to your TV
- > DVD player for your PC - a high-definition, resolution-enhanced DVD player on your PC monitor in a fully resizable window
- > 3rd Generation DVD-ROM drive screaming at 5x DVD speed
- > Dxr™2 movie picture enhancer is comparable or better than some expensive line-doublers
- > Accesses up to 25 times more information than a CD-ROM

#### Cambridge SoundWorks® DeskTop Theater™ 5.1 features:

- > Delivers movie theater sound with Dolby® Digital 5.1 and Dolby Surround® audio with PC-DVD™ or consumer DVD players
- > Dolby® Digital decoder amplifier with five discrete compact satellite speakers and subwoofer. No separate receiver required
- > Creative Multi-Speaker Surround™ upmixes stereo to 5.1-channel surround audio
- > With Sound Blaster® Live!™, it delivers discrete 4-channel surround audio with Microsoft® DirectSound™3D and supported Environmental Audio™ games

*"Exceptional quality... picture quality is fab, on both the PC and television monitors?"*



— C/NET, February 1998  
5-Star Gameworthy Review,  
PC-DVD™ Encore Dxr™2

*"The ultimate multi-speaker solution for games and movies on your PC."*



— PC Gamer, January 1999  
DeskTop Theater™ 5.1



PC-DVD™ Encore 5x is the best way to watch movies at home.

[www.soundblaster.com/experience/](http://www.soundblaster.com/experience/)

**the Live! experience.**



Go

Live the experience!

the Live! experience.

We're changing the way you think about your gear. We call it the Live! experience. It's a totally different way to interact with your PC. It's a totally different way to stimulate your senses. Transform your ordinary PC into an extraordinary play center at an incredibly affordable price! Head on down to your local dealer and bring your PC to life TODAY!

Work &amp; Learn

	Product	Price	Music	Games	Movies	Work & Learn
<b>AUDIO</b> 	> Sound Blaster® Live!™	\$199 <sup>99</sup>	◆	●	◆	
	> Sound Blaster® Live!™ Value	\$99 <sup>99</sup>		◆	●	
	> Sound Blaster® PCI128	\$69 <sup>99</sup>		●		●
<b>GRAPHICS</b> 	> 3D Blaster® Banshee (AGP & PCI)	\$99 <sup>99</sup> *		◆	●	◆
	> Graphics Blaster® RIVA TNT™ (AGP & PCI)	\$169 <sup>99</sup>		●	●	◆
	> 3D Blaster® Voodoo2™ 12MB	Call Now!		◆		
<b>PC-DVD</b> 	> PC-DVD™ Encore 5X	\$249 <sup>99</sup>		●	◆	●
	> PC-DVD™ Encore Dxr™2	\$229 <sup>99</sup>		●	●	◆
<b>SPEAKERS</b> 	> DeskTop Theater™ 5.1	\$299 <sup>99</sup>		●	◆	
	> PCWorks FourPointSurround™	\$99 <sup>99</sup>		◆		
	> SoundWorks®	\$149 <sup>99</sup>	◆			●
	> PCWorks™	\$69 <sup>99</sup>	●			◆

\* after \$30 mail-in rebate

◆ = best suited

● = good choice

CREATIVE®

WWW.SOUNDBLASTER.COM

©1999 Creative Technology Ltd. All other brands or product names listed are trademarks or registered trademarks and are property of their respective holders. Unreal™ 1998 Epic Megagames, Inc. All rights reserved. Created by Epic Megagames, Inc. in collaboration with Digital Extremes. Published and distributed by GT Interactive Software Corp. If you're not on the net, call 1.800.998.1000 for more information. All prices listed are estimated street prices and are subject to change without notice.



We put our money on the line and traded with eight Web brokerages.

**Here are the best...no bull.** By Douglas Gerlach



# Trading Places

The Top Online Brokers



## Point, click, trade—

these three little words sum up the allure of online stock brokers. Using nothing more than an Internet connection and an account with an online broker, you can buy and sell shares of stocks and mutual funds with mere keystrokes. No waiting to place an order with a brokerage house, no high commissions gobbling up big pieces of your nest egg.

Little wonder, then, that 6 million plucky investors have already exchanged the security of traditional brick-and-mortar brokerage houses for the promise of cheap, fast online transactions and reams of late-breaking information about the hottest properties on the market. But is the trade-off worth it?

### UNDERCOVER TRADERS

POSING AS ORDINARY investors, we opened accounts with eight online brokers: market leaders Ameritrade, Charles Schwab, Datek, DLJdirect, E-Trade, and Waterhouse, as well as promising upstarts Discover Brokerage Direct and Suretrade. At each site, we tested how easy it is to open an account, place a stock trade, and get help. We pestered each firm's customer service department via e-mail and by telephone, both while the market was open and when it was closed. We also gauged the site's ease of navigation and the usefulness of its stock research tools.

We discovered that no broker has it all. Your choice will depend on what's important to you. If you need a little hand-holding, you'll want a firm that excels at customer service. If you want fast, no-nonsense stock trades, look for a broker that caters to frequent traders. And if you crave the cheapest trading, be



prepared to wing it when it comes to getting answers to your questions. Check out "What Kind of Broker Is Right for You?" on page 180 for our recommendations based on four different investment strategies—one of which is probably yours.

### GOING FOR BROKER

IF YOU THINK you can start trading as soon as you finish this article, think again. While some brokers, like DLJdirect and Suretrade, don't require a minimum deposit to open an account, most want at least \$2000, and they don't take plastic.

Allow at least five business days for your check to arrive and clear before your account gets started. The only exception: DLJdirect lets new customers trade as soon as their accounts are approved, usually within seconds of applying.

You'll probably need an hour or two to find and decipher the brokerage's minimum deposit requirements, fees, commissions, and account terms. Discover and DLJdirect were the best at providing this information; at E-Trade and Suretrade, we couldn't find it easily. But once our deposits had landed, trading was easy. In most cases, our initial order to buy shares of stock was filled in mere seconds—before we could even move from the confirmation screen to the order-status screen.

Of course, the more you trade, the more you pay in commissions. That's why low-cost Web brokers are attractive to investors who trade a lot. Instead of the typical \$100 to \$175 fee a traditional broker charges, you can pay anywhere from \$8 per trade (Ameritrade and Suretrade) to \$30 (Schwab). A limit order, which designates the maximum price you're willing to pay for a stock, might cost a few dollars extra. And with most online bro-

## RATING THE BROKERS

## FEATURES COMPARISON

TRADING SITE	Fees and features								
	Minimum equity to open account	Online trade commission <sup>1</sup>	Phone trade commission <sup>2</sup>	Maximum no. of shares at minimum commission	Extras for large accounts or frequent traders?	Access to IPOs	Online account application process	Account agreement on site	Trade done in less than a minute
Ameritrade 800/454-9272 www.ameritrade.com	\$2000	\$8	\$12-\$18	none	○	○	●	●	●
Charles Schwab 800/435-4000 www.schwab.com	\$2500	\$30	\$39	1000	●	● <sup>5</sup>	○	○	●
Datek Online 888/463-2835 www.datek.com	\$2000	\$10	\$25	5000	○	○	●	●	●
Discover Brokerage Direct 800/688-6896 www.discoverbrokerage.com	\$2000	\$15	\$15-\$34	5000	●	○	○	●	○
DLJdirect 800/825-5723 www.dljdirect.com	\$0	\$20	\$20	1000	●	● <sup>6</sup>	●	●	●
E-Trade Securities 800/786-2571 www.etrade.com	\$1000	\$15	\$15-\$25	5000	●	● <sup>8</sup>	●	●	●
Suretrade 800/909-6827 www.suretrade.com	\$0	\$8	\$12-\$35	5000	○	● <sup>9</sup>	●	●	○
Waterhouse WebBroker 800/934-4410 www.waterhouse.com	\$2000	\$12	\$35-\$45	5000	○	○	○	○	●

● Yes ○ No

<sup>1</sup> Lowest available rate.

<sup>2</sup> Range of lowest rates for trades placed via touch-tone phone or conversation with live agent.

<sup>3</sup> If online service is unavailable, lowest commission rate will be honored for phone trades.



kerages, placing trades by phone—via an automated system or by talking to a flesh-and-blood broker—will run you a bit more.

One great advantage of online trading is easy access to more reports and charts than you'll find in any discount broker's office. Though this information is available elsewhere on the Web for free, the best brokers merge it directly into your portfolio display—offering links to quotes, charts, and news of your holdings, so you can keep tabs on your investments. Charles Schwab, Discover Brokerage Direct, and DLJdirect are the best at integrating research into customers' portfolio views.

And keep in mind that though we only rated brokerages on their stock trading capabilities, you might also want to consider how a firm stands up when it comes to mutual funds, bonds, options, and other investments. If you're looking for a place to park your retirement funds, all of these firms offer IRA, Roth IRA, and other retirement accounts—just watch out for the annual fees that are frequently charged for these plans.

## HELP WANTED

WHEN IT COMES TO PROVIDING HELP, nearly all the firms could use a lesson in customer care. Few of the brokers responded to our e-mailed questions in what we considered a timely fashion. The best of the bunch was Charles Schwab, whose representatives even telephoned us in response to one of our e-mail inquiries. At the other end of the spectrum, Suretrade's software system sent back immediate responses to our questions, but they were nearly always wrong or incomplete.

We also spent an average of 5 minutes on hold waiting for

customer service representatives, no matter what time of day or night we called. But once we were connected, most representatives were knowledgeable and helpful, if sometimes hurried—more than a couple rushed through our call.

## IS YOUR MONEY SAFE?

IF THE THOUGHT of spending thousands of dollars trading stocks over the Web makes your stomach flutter, relax. All online brokers require that you use a secure browser to connect to their sites, so information flowing between the broker and

your computer is encrypted, and thus protected from prying eyes on the Net. Since brokers send funds only to an account's address of record, the account can't be raided. "The worst thing any hacker could do is make malicious trades," according to Steve Hall, senior analyst with Gomez Advisors, a financial services research group.

If you're concerned about getting online on a busy market day, don't worry. Most Web brokers provide online service guarantees, in which the online rate is honored

if the network goes down and you have to make a phone call. (Sometimes, of course, the market is downright volatile. *PC World's* Web site—see the box above left—has more on the ability of online brokers to handle such crises.)

Keeping these assurances in mind, we jumped feet first into the trading pit. Despite the occasional annoyance, we found online trading to be relatively painless. And while no online brokerage excels in all areas, we'd happily give up trading by touch-tone phone or talking with a live broker for the ease and speed of placing orders with an online outfit. ▶

## WORRIED ABOUT A MARKET MELTDOWN?



IF YOU HAVE concerns about the ability of online brokerages to stave off disaster in a market crisis, read "Can Your Web Broker Handle a Market Meltdown?" on PC World's site at [www.pcworld.com/feb99/brokers](http://www.pcworld.com/feb99/brokers).

Online service guarantee <sup>1</sup>	Toll-free support hours	Ease of use						Customer service <sup>2</sup>			
		Site navigation	Trading interface	Access to stock information	Quality of research tools	Access to account	Account customization	Telephone		E-mail	
								Promptness	Helpfulness	Promptness	Helpfulness
○	M-F 6 a.m. - 10 p.m. EST	very good	good	good	good	good	very good	very good	good	poor	fair
●	24 hours daily	good	very good	very good	excellent	very good	excellent	good	excellent	excellent	excellent
●	M-F 8 a.m. - 7 p.m. EST	very good	excellent	very good	good	very good	good	excellent	very good	poor	good
●	M-F 9 a.m. - 7:30 p.m. EST	good	good	very good	good	very good	very good	excellent	fair	fair	fair
●	24 hours M - F <sup>3</sup>	very good	very good	excellent	very good	very good	poor	very good	excellent	poor	poor
●	M-F 8 a.m. - 9 p.m. EST	good	good	very good	very good	good	good	fair	good	fair	very good
●	M-F 7 a.m. - 6 p.m. EST	very good	good	good	very good	fair	poor	good	good	poor	poor
●	24 hours daily	fair	excellent	good	excellent	very good	poor	good	excellent	good	good

<sup>1</sup> Based on two phone calls and two e-mail messages.  
<sup>2</sup> "Schwab 500" clients only.

<sup>3</sup> Minimum \$100,000 account balance.  
<sup>4</sup> 8 a.m.-10 p.m. weekends.

<sup>5</sup> For IPOs offered via BancBoston Robertson Stephens, must subscribe to Professional Edge (\$25/month).

<sup>6</sup> Must qualify.



## WHAT KIND OF BROKER IS RIGHT FOR YOU?

THE FIRST QUESTION you should ask yourself before taking the online stock trading plunge is, "What kind of investor am I?" Once you determine what your personal investment style is, you can choose a brokerage firm that best complements your trading habits. Here are four types of investor and the road we think each should travel.

## THE NEWBIE



IF YOU'RE new to the Web or new to investing, a brokerage site's overall service is the most important factor. A firm with highly rated customer service can help ease your nerves as you get started: Charles Schwab and Waterhouse might be good bets in this area. And if the Web still throws you for a loop, look for a site that offers telephone trading at no additional charge. The tops in this category are E-Trade and DLJdirect.

## THE BUY-AND-HOLD TYPE



YOU BUY stocks for the long term? A \$30 commission on a stock you own for ten years won't dent your overall returns much. Since you'll want to do extensive studies of stocks or mutual funds before buying them, a site's research tools should be the most important factor in your choice. Charles Schwab and Waterhouse are great places to get the lowdown on potential purchases.

## THE ACTIVE TRADER



DO YOU buy and sell stocks at least once a week? If so, low commissions could save you big. Just remember that frequent trading can be costly in other ways. Investors typically lose a few cents on each trade due to the "spread" (the difference between the selling and purchase prices of a

stock), which is pocketed by the brokerage. Look for a broker that offers "price improvement," in which the firm executes trades in alternative markets to get the best share prices. For the frequent trader, we like Datek for its near rock-bottom commissions and trader-friendly practices.

## THE DELEGATOR



IF YOU don't think you've got what it takes to manage your own portfolio, a full-service bricks-and-mortar brokerage firm might be your best option. Though well-established firms like Salomon Smith Barney and Merrill Lynch don't broker trades online, they do offer online access to account information and background research. Still, most of your interactions will be face-to-face or on the phone with a personal account executive who can help with any financial questions you might have—from managing your portfolio to planning for your estate.

## Ameritrade

### A SQUARE DEAL

AMERITRADE IS a study in contrasts. Its opening pages are bold, colorful, and slow to download, but inside, the pages are sleek and stark. It offers one of the lowest minimum commissions around, but hidden fees quickly raise the ante. And though the site is festooned with testimonials from satisfied customers, its customer service policies are less than ideal.

The best part of Ameritrade is access to MarketGuide research, which includes a free stock screening tool and regular data updates. Unfortunately, there's no way to get information about a company from all of Ameritrade's research suppliers at once. And while the site features daily commentary from Andrew Tobias, one of the most knowledgeable financial writers around, you have to dig to find his daily gems.

Still, Ameritrade's \$8 commission for online orders ties with Suretrade's for the cheapest of the bunch. When you use the touch-tone service, the commission is \$12, and it jumps to \$18 if you place your order with a broker directly. Limit orders cost \$5 extra. Three of the firms in our survey charge extra for limit orders, and those little charges start to add up after a while. But because Ameritrade's fee schedule is buried, it's hard to know how much an account might cost you.

Ameritrade's customer service also seemed wanting: We're still waiting for a response to one of our e-mail queries. Phone service was better, but we were dismayed by some of what we heard. When we asked what would happen if Ameritrade's servers were down when we wanted to place a trade, the agent

said we could use the brokerage's touch-tone system or talk with a broker directly. Fair enough, but Ameritrade doesn't honor the online rate in that case. All the other brokers we surveyed assured us they'd honor the lowest commission if their technical problems prevented us from trading. For cautious investors, the less-than-friendly "market meltdown" policy might tip the scales against this otherwise decent site.

## Charles Schwab

### MR. POPULARITY

TAKING THREE times as many online trades a day as the next most popular site, Charles Schwab is the undisputed king of online brokers. Why do so many investors like Schwab? One reason is that the brokerage firm offers white-glove treatment, including discounts on commissions and the chance to participate in IPOs, for active traders and customers with big accounts.

Schwab's online securities research is another. Just type in a ticker symbol, and up pop news, charts, analyst and industry reports, earnings estimates, and updates on insider trading activity. You can find this information elsewhere on the Web, but you won't find it arranged as intelligently as it is at Schwab.

Of course, these extras will cost you. At a minimum of \$30 a trade, Schwab is the most expensive of the brokers in our survey. It also requires the highest minimum initial investment (\$2500) and levies a maintenance charge on accounts that are smaller than \$10,000. If you don't have at least \$10,000 to open a stock trading account, you should probably avoid ►





**FREE CATALOG!** Send card or  
call 1-800-321-4634, Ext. 3568

☒ CHECK ONE FREE CAREER CATALOG ONLY

- ☐ Computer Programming
- ☐ PC Servicing
- ☐ PC Applications Specialist
- ☐ Telecommunications
- ☐ TV/ Video/Audio Servicing
- ☐ Electronic Music Technology
- ☐ Industrial Electronics & Robotics
- ☐ Networking With Windows NT
- ☐ Basic Electronics
- ☐ Building Construction
- ☐ Home Inspection
- ☐ Air Conditioning, Heating  
& Refrigeration
- ☐ Automotive Servicing
- ☐ Fiction/Nonfiction Writing
- ☐ Bookkeeping and Accounting
- ☐ Multimedia Programming
- ☐ Mastering Microsoft Office

Name (Please Print) Age

Street (No PO Box numbers please)

City State Zip

*A Division of The McGraw-Hill Companies*



Accredited Member, Distance  
Education and Training Council

For career courses approved under G.I. Bill, ☐ check for details

5497-0299

**www.nrischools.com**

**NRI** Schools





NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

FIRST-CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

***NRI* Schools**

4401 CONNECTICUT AVENUE NW  
WASHINGTON DC 20078-3543





**With NRI training in Computer Programming, you**

# Build a top-paying career with up-to-the-minute programming skills

By 2008, computer-related employment will jump by an estimated 60% nationwide for trained programmers — with as many as 400,000 NEW jobs opening up!

Now, with NRI training, you can get the in-demand skills you need to build a top-paying career — or business of your own — in this high-growth, high-opportunity field!

**"Those with up-to-the-minute skills can almost name their price."**

— The Washington Post —

In as little as a year, you can become the highly skilled computer programmer today's companies seek — and see your NRI training literally pay off! In fact, according to *The Washington Post*, annual starting salaries range from \$32,000 all the way up to \$47,000 in some cities for those with expertise in the top programming languages!

## Master today's hottest languages!

NRI's step-by-step lessons and hands-on programming projects help you first master the design concepts used every day by successful PC programmers. You quickly move on to learn how to design, code, run, debug, and document programs in one of three of today's hottest languages — Visual Basic, C++, or Java — plus you learn to generate fully functioning Windows 98 programs. And you do it all using the powerful Pentium® II 400 computer system included in your course.

And our new Online Connection lets you send e-mail to your instructor, attend virtual discussion groups, download supplemental information, and more!

**New!  
Pentium® II  
400 PC**



## Train with a Pentium® II 400 processor-based multimedia PC, featuring...

- MMX™ technology ■ 64 meg RAM ■ 5 gigabyte hard drive ■ Super VGA color monitor
- 32X CD-ROM drive with sound card ■ 56K baud fax/modem ■ Windows 98
- Netscape Navigator™ Web browser ■ And more!

With NRI's new PC Options Plan, you can keep up with late-breaking advances in technology by upgrading your computer system at special student rates. You'll get all the details shortly before your computer is scheduled for shipment. It's NRI's state-of-the-art guarantee!

## Learn to tap the power of the Internet

Now your course includes bonus training in PC Communications and the Internet. Using the Netscape Navigator™ Web browser we provide, you can effortlessly move from one site to another as you explore the vast resources of the Internet and World Wide Web.

## Send today for your FREE catalog

If the coupon is missing, write to us at the NRI School of Programming, 4401 Connecticut Ave., NW, Washington, DC 20008. Or...

**CALL 1-800-321-4634,  
Ext. 3568**

## SEND TODAY FOR FREE NRI CATALOG!

**NRI Schools** 4401 Connecticut Avenue, NW  
Washington, DC 20008

[www.nrischools.com](http://www.nrischools.com)

### ✓ Check one FREE career catalog only

- |  |   |
|--|---|
| <input type="checkbox"/> <b>COMPUTER PROGRAMMING</b> | <input type="checkbox"/> Bookkeeping and Accounting |
| <input type="checkbox"/> Networking With Windows NT  | <input type="checkbox"/> Industrial Electronics     |
| <input type="checkbox"/> PC Servicing                | <input type="checkbox"/> Mastering Microsoft Office |
| <input type="checkbox"/> Multimedia Programming      |   |

Name \_\_\_\_\_ (please print) Age \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

A Division of The McGraw-Hill Companies

Accredited Member, Distance Education and Training Council

5497-0299



**Analyst Center**

**RESEARCH A STOCK**  
Go  
Symbol of the day  
Everything about a stock in one place, including:  
• Latest news stories  
• Comprehensive charts  
• Analyst reports  
• Company reports  
• Earnings estimates  
• Industry reports

**INDUSTRY CLOSEUP**  
Investment Services  
• Taking stock  
More industries:  
Select...  
Go  
Misc. Fabricated Products  
Go

**MARKET INSIGHT**  
• Market Highlights  
Which trade are moving and why. Analyst upgrades/downgrades.  
Go  
• Weekly Briefing  
Top of the news. Trends to watch. Inside the market.  
Go

**ANALYST RESEARCH**  
Premier analyst research from Credit Suisse First Boston, Cooper and Hambrecht & Quist LLC.  
Go  
• AMPM Notes  
Analyst helps on newsworthy companies and industries.  
Go  
• Analyst Reports  
In-depth company and industry analysis.  
Go

**Information Please** Access data on any stock at Charles Schwab's Analyst Center.

the firm—commissions will eat up too much of each purchase.

If you do have \$10,000 to invest, you'll like Schwab's sensibly arranged order-entry screens, rapid confirmation messages, and customer service. We received timely responses to our e-mail inquiries—an agent even called us to respond to an e-mailed question three times, at work and at home. We did pretty well using the phone, too. It took an average of 11 minutes during off-peak hours and 2 minutes during the market day to reach agents, but they wasted no time answering our questions. And if you really need help, you can drop by one of Schwab's 270 branch offices and talk with someone face-to-face.

**Datek**

**FAST COMPANY**

IF YOU WANT your hand held online, steer clear of high-powered Datek. You won't find much in the way of research tools here, and it can be costly to place a trade with a real person. But Datek's claim to fame isn't customer-friendly accoutrements, it's speed.

Hard-core traders will appreciate the Express Server interface, which skips the standard "Are you really really sure you want to make this trade?" confirmation screen. For the less confident investor, Datek also offers the standard trading interface, as well as a "classic" interface free of fancy graphics.

If you place an order with Datek and it's not executed within 60 seconds, the commission fee is waived (assuming, of course, that the order is marketable). And Datek will honor the \$10 online commission rate if the network goes down during trading hours and you're forced to place an order by phone. If your own ISP ever fails, Datek provides a dial-up number so you can connect directly to its servers.

Customer support was pretty peppy, too. We got answers to some—not all—of our e-mailed questions within two business days, and the customer service people picked up the phone promptly, rattling off answers as fast we could ask the questions. With this emphasis on getting down to business, the site won't win any design awards. But it is easy to navigate. And if you feel the need for speed, Datek can't be beat.

Last December Datek announced plans to operate its Island trading network as a stock exchange. If that happens, customers might be able to get even better prices on stock trades, an important consideration for frequent traders.

**DATEK ONLINE TRADING**

Helpdesk Logout Help Search Contact Us Datek Home

TRADE NOW RESOURCES ACCOUNT OPTIONS

Quotes & Trades Go Buy Charts Go History Go

Stock Symbols: BA Get Quote

Buy/Sell	Quantity	Symbol	Price	Order Type	Expire	Stop Limit
Buy	15	BA		Market	Day	
				Limit		
				Stop Market		
				Stop Limit		

Enter Order

**Wall Street Meets Easy Street** Placing your trade on Datek's bare-bones order entry screen is a breeze.

## TRADE SECRETS: TIPS FOR WEB INVESTORS

KEEP THESE TIPS in mind as you plan your online investment strategy:

**Lower your costs.** A good rule of thumb is to keep the cost of trading below 3 percent of your total investment amount.

**Watch for Y2K bugs.** Because the online brokerage industry is so new, it doesn't make much use of older systems, which can be riddled with millennium (year 2000) bugs. But these sites do interact with other computer networks that could have problems. Protect your investments by making sure your broker is Y2K compliant. Some firms, like Charles Schwab, publish a statement of their

Y2K readiness on their sites. If they don't, then find out what their policy is.

**Be redundant.** Open brokerage accounts with two or more companies and have a backup ISP available in case you can't dial up your usual provider. (Many ISPs offer limited-access accounts for \$5 to \$10 a month.) That way, you will always have solid backups in the event your online broker or ISP fails you.

**Plan for Armageddon.** For days when the market goes haywire, choose a broker with a

"market meltdown policy" that offers telephone trading at the same price as online trading, or will waive the difference if you can't log on to the site.

**Stay on top.** For updates on Web-based investing houses, visit Gomez Advisors, a research company that reviews and ranks online brokers. You can find the Gomez scorecard at [www.gomez.com](http://www.gomez.com).

And while you're surfing the Web, check out the site managed by Don Johnson, an independent investor. You can find his "Discount Stock Brokers Ranked" report at [www.sonic.net/donaldj](http://www.sonic.net/donaldj).





# Give your computer the finger!



digitalPersona

"Because It's Really You"



## U.are.U<sup>TM</sup>

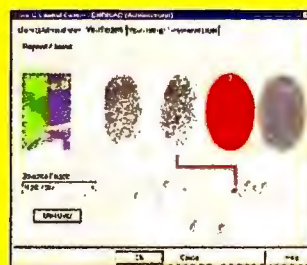
Fingerprint Recognition System

### Forget passwords!

Replace them with your fingerprint.

Gain instant, secure Windows<sup>®</sup> and internet access with one touch. Encrypt and decrypt your data on the fly with U.are.U Private Space.

"U.are.U is easy, fast, and accurate... It leads the field." — **PC Magazine**



Easy to set up and use. Fast to log on. Plugs into your USB port. **USB**

### U.are.U Applications:

**One Touch Login** gives you secure access to Windows with the touch of a fingerprint.

**One Touch Screensaver** prevents "accidental" readings or changes to your work-in-progress when you leave your desk.

**One Touch Password** lets you replace all your passwords with your fingerprint.

**U.are.U Private Space** creates a protected, fingerprint enabled drive and encrypts anything you put there.

**Announcing  
U.are.U for  
Windows  
NT!**

**Order today!**

**[www.digitalpersona.com](http://www.digitalpersona.com)**

**Call Toll FREE (877) 378 2738**



U.are.U and Digital Persona are trademarks of Digital Persona. All other trademarks are the property of their respective owners. U.are.U<sup>TM</sup> Private Space available in the U.S. only.

**Circle 82 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)**



## Discover

### ROCKY START

earn enough to buy an island. But we hit some choppy water.

For one thing, it took more than a week of e-mails, calls, and faxes to activate our account. Once it was open, we found some things to like. For instance, it's easy to customize your home page with specifics about your favorite stocks, market indexes, and account information: Just point and click the items you want to see when you log on. And news, charts, reports, and quotes are available from your portfolio view. You can also purchase stock reports.

The order-entry screen was logically arranged, and our order was filled within two minutes. But at the confirmation screen, we had to scroll down to get details on our trades, listed in hard-to-read rows.

Discover's online and touch-tone commissions start at \$15 for a market order and \$20 for a limit order. But if you place a trade by phone, the commission jumps to 1.5 to 2 cents per share (depending on whether the stock you trade is listed on NASDAQ or an exchange), with a minimum of \$34.

Since Discover Brokerage Direct is owned by investment bank Morgan Stanley Dean Witter, we won't write off the site's chances for success. But it's hard to find many compelling reasons to fall in with Discover at this stage of the campaign.

## DLJdirect

### LIKELY TO SUCCEED

OF THE FIRMS we looked at, DLJdirect would have been "Most Likely to Succeed" in high school. Lean, good-looking, and a little aloof, the site took home mostly Bs on its report card, an occasional A, and only a few low grades.

The site's design made it easy to log on, move around, and place an order. But attractiveness comes at a cost: The site's reliance on graphic buttons and menus can slow things down—not a strong point for the active trader.

The application form, however, is good for those who want instant gratification. Upon completion, your account can be approved for trading, with no minimum opening balance. If your credit is

DISCOVER BROKERAGE DIRECT is a site with big ambitions. An ad campaign last fall suggested that by trading with Discover, you could

good, you can buy and sell stocks in seconds. Within a few days, you'll receive a form to sign and return with a check.

Our trade order was filled almost at once. The minimum commission is \$20, whether you trade by modem or phone. DLJ's telephone representatives, all licensed by the National Association of Securities Dealers, were helpful, and wait times were average—around 5 minutes—no matter when we called. But we never got a response to questions we sent by e-mail.

DLJdirect's selection of research tools, midrange commission rates, and 24-hour weekday phone access might be just the right mix for slower-paced investors. And if you have \$100,000 or more in an account, you could get in on the ground floor of an IPO offered by DLJdirect's parent company, the investment bank Donaldson, Lufkin & Jenrette.



## E-Trade

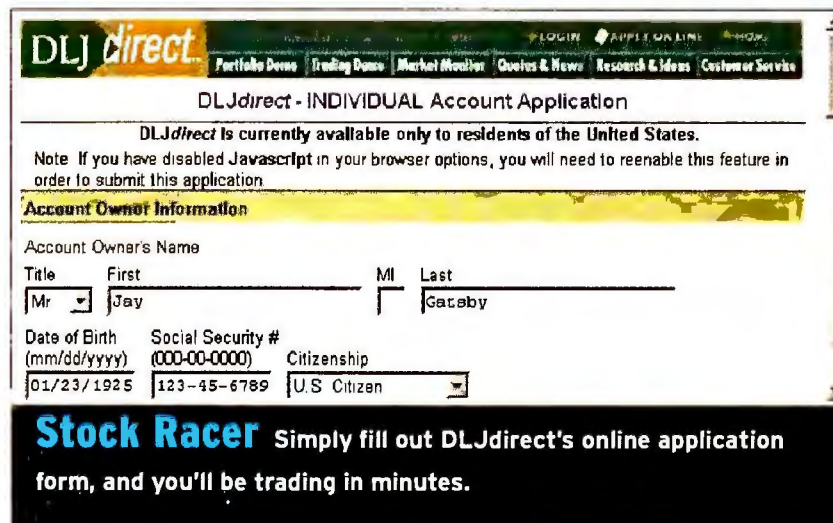
### IT AIN'T EASY

E-TRADE WANTS to be all things to all people. In addition to trading, the site offers a range of investment ideas, message boards, and

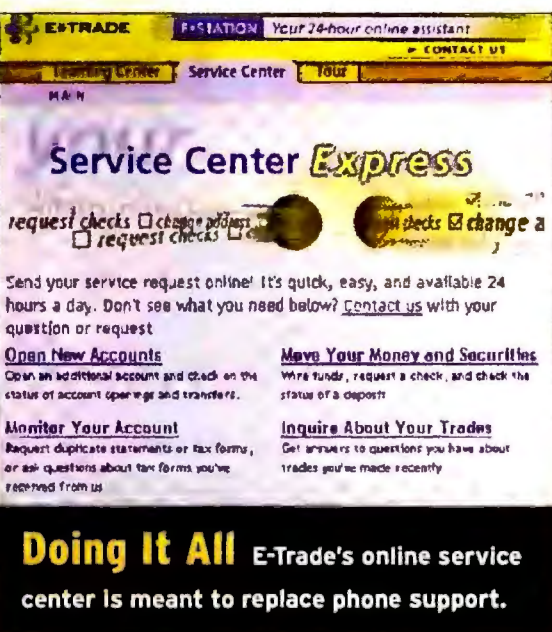
other freebies to anyone looking to improve their financial well-being. But all these extras also make trading on the site a much more complicated affair than it needs to be.

E-Trade tossed a surprising number of obstacles in our path. Casual visitors must register as "members" to access some of the financial research tools. But if you decide to become a "customer," then you might have to memorize a cryptic new user name and password (as we did). And anytime we moved from a customer area to a member area, we had to log in. Worse: We also had to enter a password every time we wanted to buy or sell a holding. (Suretrade is the only other broker in the bunch that requires a separate trading password.) Still, minimum commissions are a flat \$15 for online or phone transactions, and the trading screens are intuitively organized.

Once we had all our passwords and user names straight, we were able to access E-Trade's research tools. By entering a stock's ticker symbol into a search field, we tapped into nearly 20 pages of detailed reports and charts, mostly provided by Disclosure's Baseline service. But to get real-time stock quotes, we had to fill out another registration







form. E-Trade does provide unlimited stock quotes once you do register—a bonus most other firms don't offer.

We spent more time on hold when calling its customer support line during the market day than at any other firm—over 10 minutes. Even so, the reps were knowledgeable

ceremony when it comes to customer service. The brokerage's e-mail support is based on a software program called "the Brain," which sends automated responses to questions. The answers we got from this "smart" software were laughably bad and consistently unreliable.

On a positive note, Suretrade charges no fees for extra services, including the issuance of stock certificates. But that's unlikely to convince most investors that Suretrade is a sure thing.

## Waterhouse RESEARCH ENGINE

FOR CUSTOMER service, it's hard to beat Waterhouse WebBroker. When you sign up, you get an account officer

who provides personal attention when needed. This privilege costs, though. Waterhouse's \$12 minimum commission jumps to \$45 when you place an order with an account officer.

In other ways Waterhouse has a way to go to catch up with its online brethren, particularly when it comes to opening an account. You can't apply for an account online, and once your account is open, you still have to call to get a password before you can trade on the Web.

We also had problems with the site itself. We often got stuck trying to use the JavaScript drop-down menus, in which you select an item from a drop-down box and the appropriate page loads automatically before you can click on "Go."

When you enter the site's Research section, be sure to type in a ticker symbol in the box at the top of the screen before selecting a report from S&P, Briefing.com, or MarketGuide. If you don't, you'll get an obscure error message. Navigation style also varied by page, from a text menu of choices on the side of the browser window to graphic buttons at the bottom of the page.

Despite the frustrating interface, it was easy to place an order.

The site's stock trading screen stepped us through the process, and the confirmation screen linked us right to the order-status area. Our order to buy was filled within 60 seconds.

Waterhouse's Standard & Poor's Stock Reports were the best research tools we saw. Other sites charge a dollar or two for each report, so having the library for free can save

money. One thing we couldn't find was a copy of the account agreement, and it wasn't for lack of trying. Guess we could have used that pricey personal account officer after all.



See [www.pcworld.com/feb99/brokers](http://www.pcworld.com/feb99/brokers) for more about online trading. Douglas Gerlach is the author of *The Complete Idiot's Guide to Online Investing* (Que, 1998), and the creator of [investorama.com](http://investorama.com), a financial Web site.

and helpful, and e-mail support was better than most brokers'.

With practice, a user could get used to E-Trade's registration levels and multiple passwords. But in the competitive Net broker business, we wonder how many will want to.

## Suretrade NOT A SURE BET

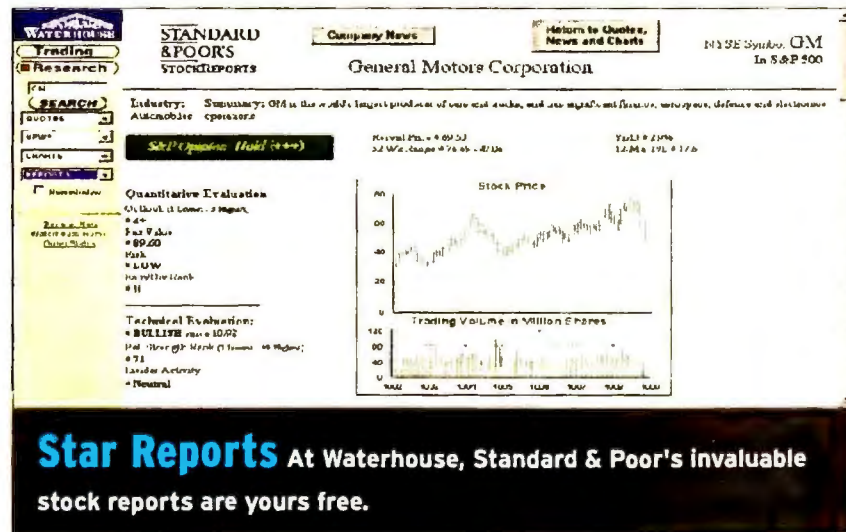
SURETRADE EMPHASIZES no-frills services at a minimum commission of \$8. And no frills is what it delivers.

Opening an account at Suretrade is tedious work. You can do it on the site, but you have to fill out a long form, and then print, sign, and return an online service agreement along with your check. Suretrade then requires five business days for your personal check to clear. So while you can open your account right away, expect to wait another week or two before you can make your first purchase.

We also found it hard to navigate the site. Each area uses its own navigational buttons, links, and menus. And the research tools—a mix of resources from Thomson, Zack's, Reuters, BigCharts, Briefing.com, and Baseline—are delivered in frames, each with its own menu of options and system of navigation. While there's a lot to choose from, it's a mix of the same free information you can find elsewhere on the Web, with some premium services tossed in. A centralized ticker lookup page would allow better access to these materials.

Once we started trading, a couple of minutes passed before our stock purchase was confirmed—one of the slowest responses in our survey. We also found the site to be a bit sluggish even during a normal trading day, which made us wonder about its performance on days when the market is hectic.

Suretrade's bare-bones approach means it doesn't stand on





# "Tired of



## Get the speed YOU need.

If you've been holding out for the cable or telephone company to bring high-speed Internet access to your neighborhood, chances are it's been a while. Which is a shame, because if you'd chosen DirecPC, you could be surfing at up to 400 Kbps **right now**. That's up to 14 times faster than a standard 28.8 modem and almost three times faster than an ISDN line.

### It's easy.

How do you get started? Just visit us at [www.direcpc.com](http://www.direcpc.com) to find a retailer near you. If you can't find a store in the neighborhood, call us at 1-800-DIRECPC. We'll send you your dish, satellite modem, software and everything else you need. We

HARDWARE  
AS LOW AS

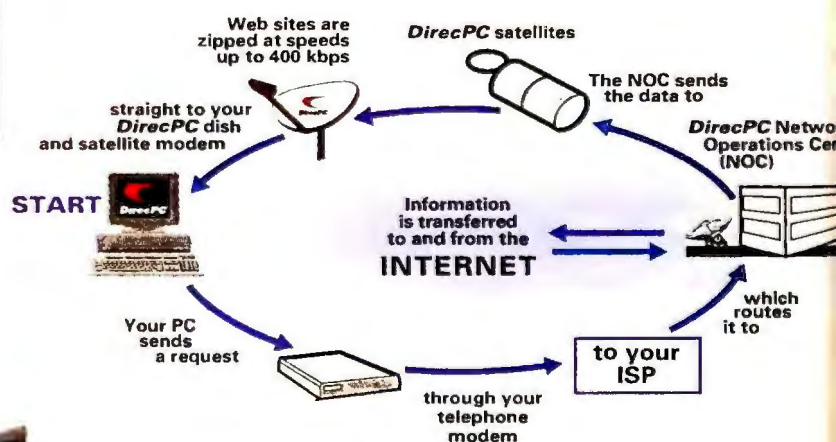
**\$199**



can arrange professional installation for you, too. Either way, getting started is just a phone call or a mouse click away.

### How does it work?

The engineers at Hughes figured out that the real bottleneck in the speed of the Internet wasn't the request **out** to the Web — telephone modems handle that just fine. Everything slows down when the Web tries to use the telephone system to send you **back** the media-rich information you requested. So, we use a much faster satellite connection for sending you the Web content you want. Check out the diagram — this is the system that makes DirecPC the fastest Internet access available nationwide.





# Waiting?"

## DirecPC gets pushy.

Sure, you love the idea of surfing the Web at up to 400 Kbps. But what if you could get your favorite Web sites and Usenet Newsgroups delivered straight into your PC by satellite — **automatically**, without even having to tie up your phone line to ask for them? That's just what DirecPC's Turbo WebCast™ and Turbo NewsCast™ services do — so you're never behind on the news and information that's important to you. The best thing about these two services? They're **free** with your paid subscription to any Turbo Internet™ service package.



**SERVICE  
AS LOW AS**

**\$19<sup>99</sup>  
MO.**

## The good news.

No other high-speed Internet access provider offers so much for so little. Take a close look at our service pricing — we're sure you'll find a package you like.

## Want TV with that?

We know what you're thinking: "If I'm going to put a dish on my roof, I might as well sign up for one of those satellite TV services, too." We agree! That's why, for a few dollars more, you can upgrade to our DirecDuo™ dish with your DirecPC satellite modem. Add a Hughes-brand digital satellite receiver (or the receiver you already own), and you get almost 200 channels of crystal-clear satellite TV from DIRECTV® as well as Turbo Internet from DirecPC. Just call 1-800-DIRECPC or stop by [www.direcpc.com](http://www.direcpc.com) to find out more.



You already know how great the Internet is — you're just looking for a way to go faster. DirecPC is the fastest Internet access available nationwide. It's affordable, and it's available everywhere. So, if you're still plugging away with an old-fashioned telephone modem, you need to ask yourself:

**What are you waiting for?**

Service Plan Details	Residential		Business
Name of Service Plan	Executive Surfer	Family Surfer	Office Surfer
Price of Service Plan (Including ISP)	\$29.99/Month	\$49.99/Month	\$129.99/Month
Price of Service Plan (Without ISP)	\$19.99/Month	\$34.99/Month	\$109.99/Month
Hours of Service (Availability)	24 Hours a Day	24 Hours a Day	24 Hours a Day
On-Line Time (Hours of usage for Turbo Internet)	25 Hours/Month	100 Hours/Month	200 Hours/Month
Additional Hourly Rate (Including ISP)	\$1.99/Hour	\$1.99/Hour	\$1.99/Hour
Additional Hourly Rate (Without ISP)	\$99/Hour	\$99/Hour	\$99/Hour
<b>DirecPC Services</b>			
Turbo Webcast: Broadcast delivery of popular Websites to your PC's hard drive	Included	Included	Included
Turbo NewsCast: Broadcast delivery of up to 30,000 Usenet Newsgroups to your PC's hard drive	Included	Included	Included
Turbo Internet: Fully interactive access to the Internet at speeds up to 400Kbps	Included in Online Time	Included in Online Time	Included in Online Time
Free E-mail Accounts		1	4
Networking (Number of Seats)	N/A	N/A	4

1 (800) DIRECPC  
WWW.DIRECPC.COM

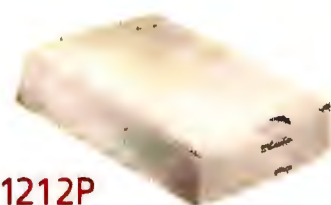
**DirecPC**

\$199 hardware price after DirecPC rebate. New Credit card customers only. Expires 3/31/99. \$100 rebate posted to credit card upon service activation. 12-month commitment to service required. \$100 cancellation fee charged to credit card if service canceled within 12 months. Cannot be combined with other DirecPC promotions. Executive Surfer and Family Surfer packages for single-user systems only and subject to Fair Access Policy and Subscriber Agreement. Speeds may vary. Not available in Alaska or Hawaii, requires line of sight to the southern sky.  
© 1999, Hughes Network Systems, a Hughes Electronics Corporation Company. DirecPC, DirecDuo, Turbo Internet, Turbo NewsCast and Turbo WebCast are trademarks of Hughes Network Systems, a Hughes Electronics Corporation Company. DIRECTV is a registered trademark of DIRECTV, a Hughes Electronics Corporation Company.



# expand your mind, legally.

An Agfa SnapScan™ lets you see things in ways you've never seen them before. Like amazing reports, sales sheets, greeting cards or anything else you can dream up. And it comes with software that lets you combine images, make colors more vivid and details more clear. So test the limits of your imagination. With an Agfa SnapScan.



## SnapScan 1212P

600(h) x 1200(v) dpi resolution, 36-bit, parallel port connection for easy installation and Agfa's OptiSpeed™ for superior performance.



## SnapScan 1212U

600(h) x 1200(v) dpi resolution, 36-bit, USB connection for easy hookup and perpetual standby.



## SnapScan 1236S & SnapScan 1236S Art Line

600(h) x 1200(v) dpi resolution, 36-bit, ISA SCSI connection for fast scans, optional transparency module and automatic document feeder.

## Software

All come with Agfa FotoLook™ and FotoSnap™ for easy control of color, resolution and sizing; Visioneer PaperPort™ software for scanned document management, including fax, copy and print functions; OmniPage™ LE OCR software; iPhotoExpress™ PC image editing software; and ColorIt!™ for the Mac®. The SnapScan 1236S Art Line also comes with additional creative software from MetaCreations!™



## AgfaJet™

For great results, print on AgfaJet.

Tel.: 1-888-281-2302, Fax: 1-978-658-4193.

[www.agfahome.com](http://www.agfahome.com)

**AGFA**   
The complete picture.

## Catalogs:

CDW • Club Mac • Mac/PC Mall • Insight •  
Micro/Mac Warehouse • Multiple Zones  
PC/Mac Connection • Publishing Perfection • Tech Squared

## Retail Stores:

B&H Foto • Fry's •  
RCS Computer

AGFA and the Agfa rhombus are registered trademarks of Agfa-Gevaert AG. All other trademarks and tradenames are property of their respective owners.



192 Power Desktops



202 Budget Desktops



212 Notebooks



216 Home PCs



218 Printers



221 Monitors



223 Graphics Boards



225 Modems



## Are Store-Bought PCs Endangered Species?



**JUST SHIP IT:** Compaq's Prosignia Desktop 330 is built to order and sold direct.

Edited by Michelle Campanale  
and Cameron Heffernan

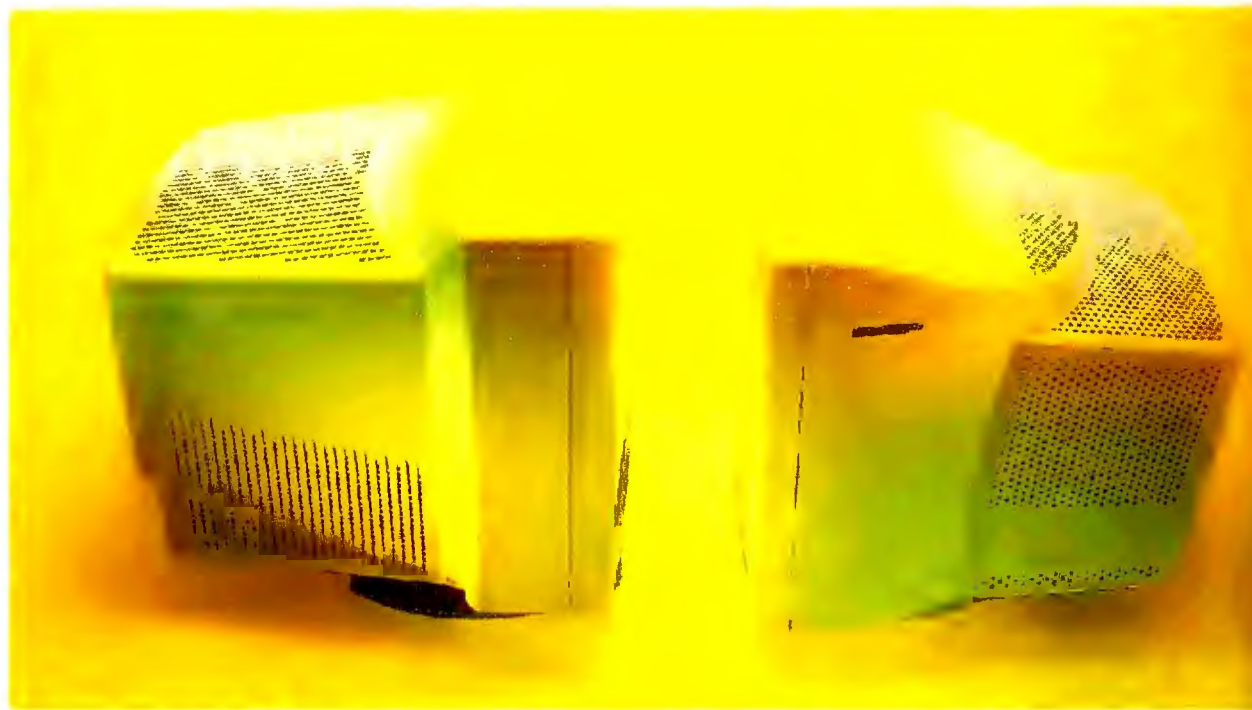


CHANCES ARE you'll buy your next PC over the phone, via the Web, through mail order, or even from a value-added reseller who gets a bounty direct from the manufacturer for each unit it sells. Though the players and the hardware remain much the same in this month's Top 20 charts, the way consumers buy computers has changed. Stores without doors are fast becoming the rule, and off-the-shelf systems may soon go the way of the dinosaurs.

### DEATH OF A SALESMAN

MORE AND MORE PC vendors are marketing their wares to small and medium-size businesses, which value a low price tag. Selling direct allows companies to offer basic machines at the lowest possible prices, so it's no surprise that all our Top 20 Best Buys this month can be purchased direct.

Dell, Gateway, and Micron have been bypassing the reseller for years. But now they have company: For example, Compaq's new Prosignia Desktop 330 and IBM's PC300GL Small Business Edition (which we'll review in March) target small



**SHORT-NECK** monitors vary in depth; the model at right saves only about a half-inch over a standard monitor.

Web, who also can select the exact components they want included in their PC.

Still, selling direct isn't exactly a new concept to companies such as Compaq, which have historically relied on channel and retail sales. In fact, Compaq has been quietly selling specific models from different product lines—such as the Armada and Presario series—on its Web site's Direct Plus and At Home sections for five or six years. The Prosignia line, however, represents Compaq's first product line that emphasizes direct sales across the board.

### BLUE LIGHT SPECIALS

MOST SYSTEMS on our charts can be purchased direct. That's good news for consumers. In fact, the average power system this month costs just \$2381.

As they make way for PCs with new processors, vendors are pricing their current stock to move. (For more information, see "Your PC in the New Millennium," page 104.)

New technologies, expected to appear in PCs by April or May, could have a big impact on the charts, pushing Pentium II-400 and even Pentium II-450 machines onto the sub-\$2000 budget chart. That's great for folks who want good performance but don't need next season's top-of-the-line processor. Falling PC prices should begin to even more

closely mirror price drops in Intel processors (see "AMD-Powered PCs Get Big Cuts," next page).

### BYE-BYE ISA?

DESPITE THE RAPID emergence of new technologies, old technology tends to stick around in PCs longer than you might expect. Many of us own Zip or LS-120 drives, yet we still use floppies regularly. Universal Serial Bus ports come standard in new PCs, but many users continue to connect peripherals via parallel or serial ports.

Last November, Microsoft and Intel introduced their "PC99" spec, which focuses on phasing out ISA slots. But here it is February 1999, and we still see ISA slots in all the PCs on our charts.

But don't expect ISA to vanish overnight. Sim Wong Hoo, chairman and CEO of Creative Labs, says that Creative has no plans to phase out the ISA-based Sound Blaster 16 card, targeted at corporate IT departments: "It's still a very big market because they buy in volume." He also says his company will continue to market the 6-year-old, \$49 product well into this year. In fact, he reports, "We're trying to stretch it into the year 2000."

Certainly PC users haven't abandoned their ISA-based peripherals. For one thing, PCI-based peripherals aren't always better. For example, though PCI modems use much newer technology than their ISA counterparts, they actually exhibited



**MODEM TO GO:** Diamond Multimedia's SupraExpress 56e.

businesses and can be custom-configured and bought over the Web or telephone.

To compete with computer vendors that sell direct, retail stores have had to change the way they do business. One large chain, CompUSA, sells built-to-order systems not only to in-store customers, but also to customers ordering via the phone or the



more reliable connections in our modem testing. That's because ISA modems normally come with their own built-in controller. (See January's *Top 10 Modems*, [www.pcworld.com/jan99/modems](http://www.pcworld.com/jan99/modems), for more details.) In this month's *Top 10 Modems* chart on page 225, we list the top seven internal and top three external V.90 modems—the former based on either ISA or PCI technology. Next month, look for PC Card modems and more internal desktop modems as part of our modem rotation.

## MONITOR PRICES: A NEW VISION

PRICES ON BOTH 19- and 21-inch monitors continue to drop. On the 19-inch half of the chart (page 221), only two monitors, Sony's \$699 Multiscan CDP-420GS and ViewSonic's \$699 MB90, are priced above \$600, while 21-inch models range from \$999 to \$1299. The best news: These price cuts don't come at the expense of image quality. The 19-inch Dell UltraScan P990, for instance, delivers bright, rich colors for only \$549.

Intriguing recent features on monitors include short necks and USB ports and hubs. Short-neck monitors can save a bit of space in cramped offices. About a year ago, the first such monitors we saw suffered from fuzziness in the corners of the screen. But Sony's 21-inch Multiscan CDP-520GS short-neck matches the display quality of its full-size peers.

USB monitors are beginning to make inroads into the Top 10 chart. The 19-inch ViewSonic MB90 with integrated speakers has a single upstream port—to handle the decidedly atypical demands of people who want to run two PCs on a single monitor—and four downstream ports for various USB peripherals.

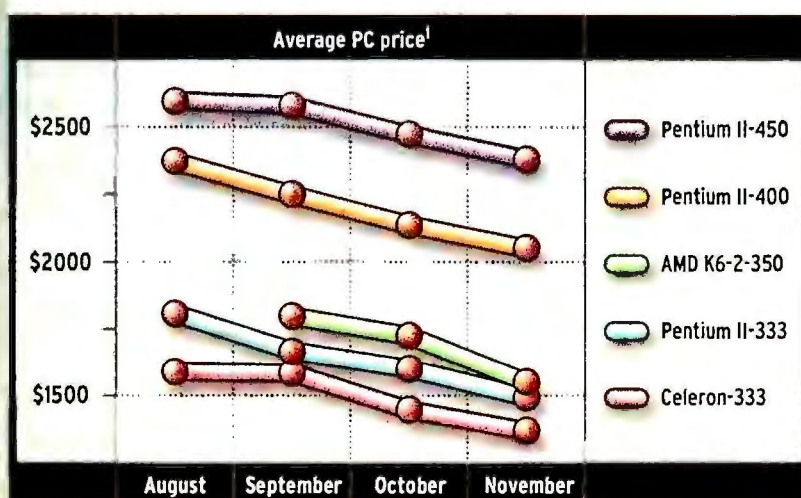
## POTENT PORTABLES

AFTER PROTRACTED delays, Accelerated Graphics Port technology has finally arrived in notebooks—including the WinBook XL2, which takes third place on this month's power notebooks chart (page 212). To see if the newly portable technology is worth its weight in pixels, we tested two AGP-equipped laptops against two using the standard PCI bus. While the AGP notebooks ran smoother and faster, their PCI counterparts produced jerky, blocky results. The improvements will cost you: Loaded with faster CPUs, more RAM, and higher-end video processors, AGP notebooks cost about \$500 more than their PCI counterparts.

*Michelle Campanale and Cameron Hefernan are associate editors for PC World. Senior Associate Editors Vince Bielski, Bryan Hastings, and Karen Silver; Associate Editor Andrew Brandt; Staff Editor Grace Aquino; Assistant Editor Mick Lockey; Editorial Assistant Kalai Murugesan; and freelance writers Gordon Meyer and JoAnne Robb contributed to the Top 100. Ulrike Diehlmann, Robert James, Elliott Kirschling, Jeff Kuta, Nancy Miller, and Mike Salayko of the PC World Test Center performed testing for the Top 100. See page 14 for contact information.*

## AMD-Powered PCs Get Big Cuts

AVERAGE PC PRICES sank by about \$100 between October and November of last year. Systems based on AMD's K6-2-350 processor fell the furthest—\$174 on average.



<sup>1</sup>Prices are as collected for our Top 20 charts. Months represent the dates in 1998 when we collected prices, not the magazine issue dates. The number of averaged PC prices ranges from 5 for the AMD K6-2-350 to 35 for the Pentium II-400.

QUESTIONS ABOUT OUR CHARTS? The following section should answer most of them.



**How do the charts work?** The Top 20 and Top 10 charts are evolving lists of the best PCs, printers, monitors, graphics boards, and modems we've tested. System charts are divided by price. Power desktops cost \$2000 or more; power notebooks cost \$2750 or more. We compare new products with previously reviewed hardware, updating the charts to reflect price cuts as well as other changes.



**Where do you get your prices?** We estimate street prices based on vendor information and our own research, including surveys of retail outlets. We recheck all prices every month.



**What does the overall rating mean?** This 100-point scale reflects results from our hands-on evaluations and performance tests. A score in the 90s is exceptional, while one in the 80s is among the best and one in the 70s above average.



**What does the PC WorldBench 98 score mean?** It's a measure of how fast a PC is in relation to our baseline machine, a Gateway PMMX-200 configured with 32MB of RAM, a 2GB hard drive, and 512KB of secondary cache. A PC that scores 200, for instance, is twice as fast as the baseline system.



**Where do the scores for reliability, support quality, and support policies come from?** Reliability and support quality scores are based on surveys of *PC World* readers and anonymous support calls made by *PC World* staff. The policies score is based on vendor support policies.








**What do all those word scores mean?** Word scores for performance and price are based on a product's rating in relation to other products in its category. For instance, we score the performance of Windows NT PCs separately from that of Windows 95 machines. (Based on our PC WorldBench 98 tests, Windows NT machines are faster on average than Win 95 PCs.)



**Check out *PC World's* Top 400 reviews online.** Point your browser to PC World Online ([www.pcworld.com/top400](http://www.pcworld.com/top400)) to explore our Top 400, which provides comprehensive reviews and ratings for products in 16 different categories. You'll also find reviews not available in print.



# TOP 20 POWER DESKTOPS

	SYSTEM	Last month	Month tested	Street price (11/20/98)	CPU	Comments
1	 Dell OptiPlex GX1 400 800/289-3355 www.dell.com	2	Aug 98	\$2145	Pentium II-400	Zippy corporate PC with easy-service design gets \$275 price cut; speakers extra.
2	 Micron Millennia 400 Max 888/634-8799 www.micronpc.com	1	July 98	\$2028	Pentium II-400	Micron slashes \$193 off fastest Win 95 PII-400; DVD-ROM and Zip drive included.
3	 Gateway GP6-450 800/846-2000 www.gateway.com	3	Jan 99	\$2314	Pentium II-450	General-business PC with management options, network card, modem sheds \$179.
4	 Dell Dimension XPS R450 800/388-8542 www.dell.com	4	Nov 98	\$2529	Pentium II-450	Well-built PC for small to midsize businesses has DVD-ROM drive but no Zip drive.
5	 Gateway E-4200 450 800/779-2000 www.gateway.com	n/a	<b>NEW</b>	\$2399	Pentium II-450	Managed PC with strong warranty, support, and network card; slowest on chart.
6	MidWest Micro Business Solutions 400 800/728-8582 www.mwmicro.com	5	Dec 98	\$2014	Pentium II-400	Inexpensive, network-ready PC runs NT and includes LS-120 drive.
7	Polywell Poly 8450 B5 800/999-1278 www.polywell.com	6	Jan 99	\$2195	Pentium II-450	Name change on fastest Win 98 system; powerful multimedia and value price.
8	NEC Direction SP B450 888/863-2669 www.necnow.com	7	Dec 98	\$2699	Pentium II-450	Expensive PC offers good speed, 19-inch monitor, and great reliability rating.
9	NEC PowerMate 8100 888/863-2669 www.necnow.com	11	Jan 99	\$2768	Pentium II-450	Pricy corporate PC has network card and US8 monitor, but no software bundle.
10	Sys Technology Performance Pro 450 800/613-9963 www.sys.com	13	Dec 98	\$2499	Pentium II-450	Price falls \$200 on fast, networked PC with LS-120; improved service and support.
11	HP Brio 8500 PII-450 800/752-0900 www.hp.com	n/a	Dec 98	\$2344	Pentium II-450	Fast Win NT PC gets includes network card and CD-RW drive but has fuzzy monitor.
12	Acma ZPower 6450 PII-450 800/786-6888 www.acma.com	14	Nov 98	\$2198	Pentium II-450	Acma takes \$197 off PC with 128M8 of RAM and Zip drive.
13	Premio Apollo BX 450 800/677-6477 www.premiopc.com	10	Jan 99	\$2224	Pentium II-450	Sturdy PC has lots of RAM and DVD-ROM drive but support policies are thin.
14	HP Vectra VL Series 8 HE 800/322-4772 www.hp.com	n/a	Nov 98	\$2370	Pentium II-450	HP's high-end, multimedia-savvy corporate PC gets a whopping \$490 price cut.
15	Quantex QP6/450 SM-4x SE 800/896-4898 www.quantex.com	n/a	<b>NEW</b>	\$2499	Pentium II-450	Small-business PC includes 4.8X DVD-ROM drive and good software bundle.
16	IBM PC 300 PL 800/426-2968 www.ibm.com	12	Jan 99	\$2519	Pentium II-450	Network-ready speed demon has network card and good price.
17	Compaq Prosignia Desktop 330 800/345-1518 www.compaq.com	n/a	<b>NEW</b>	\$2429	Pentium II-450	New small-business PC has network card and modem; mediocre internal design.
18	Compaq Deskpro EP 6450 800/345-1518 www.compaq.com	9	Nov 98	\$2343	Pentium II-450	Corporate PC includes convertible case and Zip drive.
19	NexTrend NexStar-450 PWJ 888/838-7827 www.nextrendpc.com	16	Jan 99	\$2599	Pentium II-450	Swift system packs Zip drive and hardware MPEG decoder.
20	MidWest Micro Office Pro 450 800/728-8582 www.mwmicro.com	17	Jan 99	\$2499	Pentium II-450	Midrange performer has Zip drive, 40X CD-ROM, and multimedia software bundle.



Best Buy

See features chart, page 194; test report, page 196.

n/a = not applicable

<sup>1</sup>A system's performance word score is relative to scores of other PCs running the same operating system. For more details see "Your Guide to the Top 100" on page 191.

<sup>2</sup>For more information about all products in this table, select PC World InfoNet no. 903 or visit [www.pcworld.com/infonet](http://www.pcworld.com/infonet).



STEEP DISCOUNTS ABOUND on this month's power chart, as five systems drop \$170 or more. Surprisingly enough, Hewlett-Packard makes the biggest cut, slashing \$490 off the price of its corporate Vectra VL Series 8 HE; this Pentium II-450 system replaces the PII-400 edition that made the chart last month. In fact, only three PII-400s remain on the power chart, but they're all especially good values. Two are Best Buys, and one of these, Dell's OptiPlex GX 1400, rises to become the first corporate-centric system to occupy the number one spot. Another managed PC, Gateway's new E-4200 450, also cracks the top five. It's somewhat slow compared to similarly equipped PCs, but it's cheap for its processor class.



## SCORECARD

★ Overall rating	PC WorldBench 98/operating system	Performance	Features and design	Vendor's system reliability	Price	Vendor's support quality/policies	PC World InfoNet number <sup>2</sup>
89	244/Win NT 4.0	good	good	good	inexpensive	good/outstanding	620
88	210/Win 95	good	very good	good	inexpensive	good/good	621
87	213/Win 98	good	very good	good	average	fair/outstanding	622
83	212/Win 98	good	very good	good	average	good/good	623
83	204/Win 98	good	very good	good	average	fair/outstanding	624
82	233/Win NT 4.0	good	outstanding	3	inexpensive	good <sup>4</sup> /good	625
82	224/Win 98	outstanding	very good	3	inexpensive	good <sup>4</sup> /fair	626
82	220/Win 98	very good	very good	outstanding	expensive	good <sup>4</sup> /good	627
82	218/Win 95	very good	very good	outstanding	expensive	good <sup>4</sup> /good	628
81	222/Win 98	very good	outstanding	3	average	good <sup>4</sup> /good	629
81	263/Win NT 4.0	outstanding	satisfactory	good	average	good/good	630
80	217/Win 98	very good	good	3	inexpensive	good <sup>4</sup> /good	631
79	214/Win 98	very good	very good	3	inexpensive	good <sup>4</sup> /good	632
78	216/Win 98	very good	very good	good	average	good/poor	633
78	213/Win 98	good	outstanding	3	average	fair <sup>4</sup> /good	634
78	219/Win 98	very good	good	fair	average	good/good	—
78	210/Win 98	good	very good	good	average	fair/good	635
77	214/Win 98	very good	good	good	average	fair/outstanding	636
77	218/Win 98	very good	very good	3	expensive	fair <sup>4</sup> /good	637
76	210/Win 98	good	outstanding	3	average	good <sup>4</sup> /good	638
Scorecard weightings ▶		Performance 25 percent	Features 25 percent	Reliability 15 percent	Price 15 percent	Quality/policies 10 percent each	

insufficient data to give a rating.


<sup>4</sup> Scores were derived from anonymous support-quality calls due to insufficient data from survey.

## This Month's Best Buys

### 1 DELL OPTIPLEX GX1 400

**PRO:** Attractively designed corporate system, easy access to interior, excellent monitor

**CON:** Relatively small hard drive, no AGP slot

 Up one notch from last month, the Dell OptiPlex GX1 400 is the new number one Best Buy on our

power chart. This \$2145 corporate-oriented midtower features integrated remote management hardware and an easy-to-access interior, and logs an impressive PC WorldBench 98 score of 244. Dell's high reliability and service scores should clinch a spot for the OptiPlex GX1 400 on any corporate IS manager's shopping list.

The OptiPlex's modular case design allows every part of the system to swivel,

glide, or swing open for easy access. Removing the cover is a snap: Just press a button on the front and flick the case-lock switch at the back, and the cover swings up and out of the way. Expansion cards mounted on a separate chassis slide out as you press a lever—no scraped knuckles here. The power supply pivots upward and provides easy access to RAM slots and the motherboard. Unfortunately, however, there's no AGP slot, so you won't be able to upgrade the integrated AGP graphics with a higher-end AGP graphics board in the future.


But in general, upgrades shouldn't enter into the picture for some time, thanks to the hardware Dell already includes. The 6.4GB hard disk suffices for most uses, but all the other Best Buys this month come with 10GB. Dell's bundled UltraScan 1000HS monitor, one of the best 17-inch Trinitron displays currently available, delivers excellent image quality.

Dell ships the OptiPlex with the Windows NT 4.0 operating system and covers the machine with a three-year warranty on parts and labor. Telephone support lines operate around the clock.

### 2 MICRON MILLENNIA 400 MAX

**PRO:** Fast Windows 95 PII-400, 4X DVD-ROM drive, Zip drive, affordable, good reliability

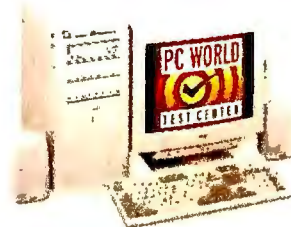
**CON:** Mediocre audio and monitor, sparse documentation, lackluster labor warranty

 The Micron Millennia 400 Max set the performance standard among Pentium II-400 systems when we first reviewed it in July 1998. Seven months later, its PC WorldBench 98 score of 210 still stands as the highest we've seen for a

Windows 95-based PII-400. At \$2028, it's easy on the wallet, too. The Millennia 400 Max comes

loaded with attractive features, and our readers tell us that Micron's systems are reliable.

This PC even looks fast, with chiseled curves and molded slots for its exter- ▶



Dell OptiPlex GX1 400



Micron Millennia 400 Max



	SYSTEM	CPU	Operating system	RAM (MB)	Secondary cache (KB)	Hard drive (GB)	Graphics adapter (AGP)	Video RAM (MB/type)	Monitor tube/viewable diagonal (inches)	56-kbps modem protocol
1	Dell OptiPlex GX1 400*	Pentium II-400	Windows NT 4.0	64	512	6.4	Integrated ATI 3D Rage Pro	8/SGRAM	17/15.9	not included
2	Micron Millennia 400 Max*	Pentium II-400	Windows 95	64	512	10	Diamond Fire GL 1000 Pro	8/SGRAM	17/16	x2
3	Gateway GP6-450*	Pentium II-450	Windows 98	64	512	10	ATI Xpert98	8/SDRAM	19/18	x2
4	Dell Dimension XPS R450*	Pentium II-450	Windows 98	128	512	10	STB Velocity 12Bzx	8/SGRAM <sup>3</sup>	17/16	x2
5	Gateway E-4200 450*	Pentium II-450	Windows 98	128	512	10	ATI Rage Pro Turbo	8/SGRAM	19/18	not included
6	MidWest Micro Business Solutions 400	Pentium II-400	Windows NT 4.0	128	512	12.7	STB Velocity 4400	16/SDRAM	17/15.8	not included
7	Polywell Poly 8450 B5	Pentium II-450	Windows 98	128	512	10	Matrox Millennium G200	8/SGRAM	17/16	V.90
8	NEC Direction SP B450	Pentium II-450	Windows 98	64	512	14.4	ATI Xpert9B	8/SDRAM	19/17.9	x2
9	NEC PowerMate 8100	Pentium II-450	Windows 95	64	512	14.4	Accel Graphics AccelStar 3D II	8/SDRAM	17/15	not included
10	Sys Technology Performance Pro 450	Pentium II-450	Windows 98	128	512	10.1	Matrox Mystique G200	8/SGRAM	17/15.8	V.90
11	HP Brio 8500 PII-450	Pentium II-450	Windows NT 4.0	64	512	10.1	Integrated ATI 3D Rage Pro	4/SGRAM	17/16	not included
12	Acma ZPower 6450 PII-450	Pentium II-450	Windows 98	128	512	10.1	Real 3D StarFighter AGP	8/SGRAM	17/16.1	V.90
13	Premio Apollo BX 450	Pentium II-450	Windows 98	128	512	10.2	Matrox Millennium G200	8/SGRAM	17/16	V.90
14	HP Vectra VL Series 8 HE	Pentium II-450	Windows 98	64	512	10.1	Integrated Matrox G200	8/SGRAM	17/16	not included
15	Quantex QP6/450 SM-4x SE	Pentium II-450	Windows 98	128	512	16.8	STB Velocity 4400	16/SDRAM	19/18	V.90
16	IBM PC 300 PL	Pentium II-450	Windows 98	64	512	9.1	Matrox Millennium G200	8/SGRAM	17/16	not included
17	Compaq Prosignia Desktop 330	Pentium II-450	Windows 98	128	512	16.8	STB Velocity 4400	16/SDRAM	17/16	V.90
18	Compaq Deskpro EP 6450	Pentium II-450	Windows 98	64	512	10	Matrox Millennium G200	4/SGRAM	17/16	K56flex
19	NexTrend NexStar-450 PWJ	Pentium II-450	Windows 98	128	512	14	STB Velocity 12Bzx	8/SGRAM	19/18.2	V.90
20	MidWest Micro Office Pro 450	Pentium II-450	Windows 98	128	512	13.6	STB Velocity 4400	16/SDRAM	19/18	K56flex

\* Best Buy

<sup>1</sup> PC World defines towers as taller than 20 inches, midtowers as 15.5 inches to 20 inches, and minitowers as shorter than 15.5 inches.<sup>2</sup> Five years on CPU and main RAM, three years on other parts.<sup>3</sup> Tested with 8MB of video RAM; now comes standard with 16MB.

nal storage slots. The system comes with floppy, Zip, and DVD-ROM drives; the ports on its back are helpfully color-coded; and the midtower case opens easily to reveal a tidily arranged interior with plenty of open drive bays, card slots, and DIMM sockets.

The Millennia 400 Max's Diamond Fire GL 1000 Pro AGP card delivers snappy graphics, but the 17-inch monitor is less impressive: Images appeared washed out and a bit fuzzy at the edges. The bundled Advent AV390PL speakers and subwoofer are sufficient for common business use, but you have to crank up the volume to get any bass out of the subwoofer. Micron also bundles Microsoft Office 97 Small Business Edition and an x2 56-kbps modem from 3Com.

Beyond information on individual components, documentation is sparse. Micron offers 24-hour phone support and a five-year warranty on CPU and RAM, but the company covers labor for only one year.

### 3 GATEWAY GP6-450

**PRO:** Good performance, includes network card and modem, easy setup

**CON:** No DVD-ROM drive



With a price of \$2314—\$179 lower than last month—and a respectable PC WorldBench 98 score of 213, the GP6-450 balances affordability with solid performance. Ultimately, the GP6-450 is built for business, packing both a 56-kbps modem and an ethernet card that's ready to plug into a cable modem or small business network. It also

ships with a 19-inch monitor—great for really large spreadsheets—but lacks a DVD-ROM drive; our test system included a 13X–32X CD-ROM drive instead.

During the PC World Test Center's 2D tests, the GP6-450 delivered high frame rates, guaranteeing sharp business presentations. The system's Altec Lansing speakers are okay for casual music listening but lack extended bass and treble.

Gateway systems tend to be easy to set up and use, and the GP6-450 is no exception. Color-coded ports make plugging in cables a breeze, and terrific documentation smooths out installation rough spots. The intuitive monitor and multimedia controls include such welcome extras as audio adjustments and programmable application-launching keyboard buttons.



## EXPANDABILITY

## CUSTOMER SUPPORT

CD/DVD-ROM drive speed	Sound board
14X-32X	integrated Yamaha OPL3
4X DVD-ROM	integrated Crystal PnP
13X-32X	Creative Audio PCI 64V
4.8X DVD-ROM	Turtle Beach Montego
13X-32X	Sound Blaster Audio PCI 64V
14X-40X	Aureal A3D PCI
2X DVD-ROM	Aztech PCI 338-A3D
14X-32X	integrated Crystal PnP
12X-32X	integrated Crystal PnP
17X-40X	Sound Blaster AWE64
20X-32X	Aztech AZT2320
12X-32X	integrated Crystal PnP
2X DVD-ROM	Sound Blaster AWE64
12X-32X	Aztech AZT2320
4.8X DVD-ROM	Creative Audio PCI 64V
14X-32X	integrated Crystal PnP
12X-40X	Creative Ensoniq 1371
12X-32X	integrated ESS 1B69
2X DVD-ROM	Sound Blaster PCI 128
17X-40X	Sound Blaster PCI 128

Case style <sup>1</sup>	Max. RAM (MB)	Open RAM sockets	Open drive bays (ext./int.)	Open slots
midtower	384	2	2/1	7
midtower	384	2	2/1	4
midtower	384	2	3/2	3
midtower	768	2	2/1	2
midtower	384	2	3/2	3
midtower	384	2	3/1	3
midtower	1024	3	3/1	3
midtower	384	2	3/1	4
midtower	384	2	2/1	5
midtower	1024	3	3/2	4
midtower	384	2	3/0	3
midtower	384	2	0/1	3
midtower	1024	3	3/2	3
minitower	384	2	2/1	4
midtower	768	1	2/3	4
desktop	384	2	1/0	4
midtower	384	2	1/1	2
desktop	384	2	0/1	3
midtower	1024	2	1/1	3
midtower	768	2	2/1	4

Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
varies <sup>2</sup> /1	24	Sat., Sun.	BBS, CIS, WWW
3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
3/1	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
varies <sup>2</sup> /3	24	Sat., Sun.	BBS, WWW
1/5	24	Sat., Sun.	WWW
3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
varies <sup>4</sup> /5	24	Sat., Sun.	WWW
3/90 days	24	Sat., Sun.	AOL, CIS, WWW
3/1	24	Sat., Sun.	BBS, WWW
3/3	9	none	BBS, WWW
3/1	5	none	AOL, BBS, CIS, WWW
3/1	24	Sat., Sun.	BBS, WWW
3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
3/1	24	Sat., Sun.	AOL, BBS, CIS, Prodigy, WWW
3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
3/3	24	Sat., Sun.	none
varies <sup>2</sup> /3	24	Sat., Sun.	BBS, WWW

<sup>1</sup> Six years on CPU and main RAM, three years on other parts.

<sup>2</sup> HP's offering of 11 hours of weekday support is not toll-free.



Gateway GP6-450

Three open slots ensure trouble-free expandability, and if the 10GB hard drive begins to fill up, you can use one of the three free externally accessible drive bays to add a second hard disk, a Zip drive, or a tape backup unit.

When the system is configured with 64MB of RAM, the tall midtower's roomy interior includes two free memory sockets, though you might want to order yours with 128MB, since doubling the RAM can cost as little as \$100.

Bundled with the GP6-450 are three extremely useful software titles for small-office/home-office use: Microsoft's Bookshelf 98, Expedia Streets 98, and Office

97 Small Business Edition. In our recent reliability and service survey, *PC World* subscribers rated the reliability of Gateway's business PCs highly, but the company earned only fair marks for service, as readers reported long waits for tech support. In our anonymous calls to Gateway's 24-hour line, however, our average wait was between 5 and 10 minutes, and the courteous reps gave good advice.

#### 4 DELL DIMENSION XPS R450

**PRO:** Impressive performance, extensive features including high-quality 4.8X DVD-ROM drive and MPEG 2 playback

**CON:** Modem is not V.90 standard



If you're venturing away from the corporate fold, Dell's latest Windows 98 midtower is a terrific

choice. At \$2529 it isn't a pocket-change purchase, but its fast performance, multimedia features, and strong reliability and support make it one of our top picks for power-hungry small or home businesses.

This Dimension sports Intel's 450-MHz Pentium II, and it shows: The R450 loads Microsoft Word and Internet Explorer on the screen almost instantly, chalking up a PC WorldBench 98 score of 212. File junkies and pack rats will benefit from the spacious 10GB hard drive.

Multimedia capability is one of this system's strengths. The DVD video output is as smooth as a baby's forehead, thanks to the XPS R450's effective MPEG 2 playback, substantial 128MB of RAM, and 17-inch Trinitron monitor. Even with half a dozen apps churning away in the ►



background, playback remained flawless. The included Turtle Beach Montego sound card and Altec Lansing ACS295 speaker-subwoofer combination offer powerful sound with a crystal-clear tone. Just make sure you have enough space under your desk to accommodate the subwoofer, which is approximately the size of a small microwave oven.

Besides price, the only nit we found to pick involves the

system's x2-standard 56-kbps modem. Unlike many of its competitors, Dell has yet to equip its PCs with modems built to the global V.90 standard. In every other respect, though, the Dimension XPS



Dell Dimension XPS R450

R450 is a well-built, well-documented system. Dell backs it with a support policy that includes 24-hour telephone support seven days a week, and our readers rate Dell's system reliability as good.

## 5 GATEWAY E-4200 450

**PRO:** Comprehensive warranty and support, sharp 19-inch monitor, remote management

**CON:** A bit slow for a PII-450 PC, difficult-to-access memory.



Gateway's corporate powerhouse, the E-4200 450, delivers solid performance at a competitive price.

Like all the PCs in Gateway's E series, it's designed for corporate IS departments that are building networks of managed PCs. You get DMI 2.0 compliance ►

## TOP 20 POWER DESKTOPS

## TEST REPORT

	SYSTEM	CPU	Operating system	RAM (MB)	Secondary cache (KB)	PC World-Bench 98 score	<b>Faster</b>	Average of tested Pentium II-450s <sup>1</sup>
1	Dell OptiPlex GX1 400*	Pentium II-400	Win NT 4.0	64	512	244		
2	Micron Millennia 400 Max*	Pentium II-400	Win 95	64	512	210		
3	Gateway GP6-450*	Pentium II-450	Win 98	64	512	213		
4	Dell Dimension XPS R450*	Pentium II-450	Win 98	128	512	212		
5	Gateway E-4200 450*	Pentium II-450	Win 98	128	512	204		
6	MidWest Micro Business Solutions 400	Pentium II-400	Win NT 4.0	128	512	233		
7	Polywell Poly 8450 B5	Pentium II-450	Win 98	128	512	224		
8	NEC Direction SP B450	Pentium II-450	Win 98	64	512	220		
9	NEC PowerMate 8100	Pentium II-450	Win 95	64	512	218		
10	Sys Technology Performance Pro 450	Pentium II-450	Win 98	128	512	222		
11	HP Brio 8500 PII-450	Pentium II-450	Win NT 4.0	64	512	263		
12	Acma ZPower 6450 PII-450	Pentium II-450	Win 98	128	512	217		
13	Premio Apollo BX 450	Pentium II-450	Win 98	128	512	214		
14	HP Vectra VL Series 8 HE	Pentium II-450	Win 98	64	512	216		
15	Quantex QP6/450 SM-4x SE	Pentium II-450	Win 98	128	512	213		
16	IBM PC 300 PL	Pentium II-450	Win 98	64	512	219		
17	Compaq Prosignia Desktop 330	Pentium II-450	Win 98	128	512	210		
18	Compaq Deskpro EP 6450	Pentium II-450	Win 98	64	512	214		
19	NexTrend NexStar-450 PWJ	Pentium II-450	Win 98	128	512	218		
20	MidWest Micro Office Pro 450	Pentium II-450	Win 98	128	512	210		

\*Best Buy

Application test times in minutes

0 10 20



Word 97



Word Pro 97



Excel 97



1-2-3 97



Paradox 8.0



Picture Publisher 7.0



**HOW WE TEST** All systems are tested with PC WorldBench 98, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs are tested with Windows 95, Windows 98, or Windows NT 4.0, and video resolution is set to 800 by 600 in 65,536 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench 98 score is a sum of the weighted, normalized result of each script: Word 97 (10 percent), Word Pro 97 (10 percent), Excel 97 (20 percent), 1-2-3 97 (20 percent), Paradox 8.0 (20 percent), and Picture Publisher 7.0 (20 percent). For more details on our benchmark and how we run it, see PC World Online ([www.pcworld.com/testing](http://www.pcworld.com/testing)). <sup>1</sup>Under Windows 98.





**Your PC Servicing training includes a Pentium® II 400 personal computer with MMX™ technology, 64 meg RAM, 5 gigabyte hard drive, Super VGA color monitor, 32X CD-ROM drive, and 56K baud fax/modem**

# **NRI** Schools

4401 Connecticut Avenue, NW  
Washington, DC 20008

☒ **YES!** Send me free information on how NRI can prepare me for a high-tech computer career. Check one box only.

- |   |  |
|---|--|
| <input type="checkbox"/> <b>PC Servicing</b>        | <input type="checkbox"/> PC Applications             |
| <input type="checkbox"/> Networking With Windows NT | <input type="checkbox"/> Computer-Aided Drafting     |
| <input type="checkbox"/> Industrial Electronics     | <input type="checkbox"/> Electronic Music Technology |
| <input type="checkbox"/> Telecommunications         | <input type="checkbox"/> Computer Programming        |
| <input type="checkbox"/> Mastering Microsoft Office | <input type="checkbox"/> Bookkeeping & Accounting    |

Name \_\_\_\_\_

Street \_\_\_\_\_ Apt. # \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Phone ( \_\_\_\_\_ ) \_\_\_\_\_



*A Division of The McGraw-Hill Companies*

Accredited Member, Distance Education and Training Council

**0141-0299**

**Call or send for FREE information:**

**1-800-321-4634, Ext. 3628**

**or reach us online at: [www.nrischools.com](http://www.nrischools.com)**





NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

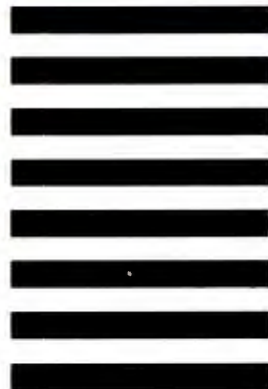
**BUSINESS REPLY MAIL**

FIRST-CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

***NRI* Schools**

4401 CONNECTICUT AVENUE NW  
WASHINGTON DC 20078-3543





# Take control of today's technology!

**NRI Schools now gives you a fast, easy way to break into the high-tech industry as a PC Servicing Technician**

**With NRI's PC Servicing course,** you can get the practical skills and experience to service any computer with confidence. From diagnostic software to CD-ROM tutorials to a high-end computer system, NRI gives you the technological tools and training you need to carve out a successful new career, even start a business of your own!

## Learn essential PC servicing skills with these unique course features:

- CD-ROM training from Norton interactive—designed by acclaimed software developer Peter Norton, this unique training tool has realistic simulations, special effects, full-color graphics, and role-playing lessons.
- ForeFront Troubleshooter™ Software and CD-ROM pinpoints system failures and diagnoses faulty components.
- Troubleshooting training—includes McGraw-Hill's easy-to-follow guides on troubleshooting and interactive computer-aided electronics diskettes relating to four key areas: AC electronics, DC electronics, semiconductors, and electronic circuits.
- Windows 98—this long-awaited version of Windows has more power, a new Web look, e-mail capabilities, single-click functionality, and System File Checker.



**You'll also perform hands-on experiments with NRI's exclusive labs: computer-aided electronics demonstrations, 8085 Microprocessor, and NRI Discovery Lab, a complete breadboarding system.**

**Your training includes a Pentium® II 400 personal computer, with MMX™ technology, 64 meg RAM, 5 gigabyte hard drive, Super VGA color monitor, 32X CD-ROM drive, and 56K baud fax/modem**



## A+ Certification—a credential that counts!

Your value as a computer service technician will soar with coveted A+ Certification. With NRI, you get essential study tips, test-taking strategies, and supplemental lessons, plus interactive tutorials and practice tests on CD-ROM. As you prepare for the exam, you'll also benefit from online support from NRI's personal instructors.

You cover these important exam subjects:

- Diagnosing & Troubleshooting
- Memory Management
- Networks
- Operating Systems
- Printers
- Portable Systems
- and more!



**Call or send for FREE information:**

**1-800-321-4634**

**Ext. 3628**

**or reach us online at: [www.nrischools.com](http://www.nrischools.com)**

**NRI Schools**

4401 Connecticut Avenue, NW  
Washington, DC 20008

☒ **YES!** Send me free information on how NRI can prepare me for a high-tech computer career. Check one box only.

- |   |   |
|---|---|
| <input type="checkbox"/> PC Servicing               | <input type="checkbox"/> Computer Programming     |
| <input type="checkbox"/> Networking With Windows NT | <input type="checkbox"/> Telecommunications       |
| <input type="checkbox"/> Industrial Electronics     | <input type="checkbox"/> Computer-Aided Drafting  |
| <input type="checkbox"/> Mastering Microsoft Office | <input type="checkbox"/> Bookkeeping & Accounting |

Name \_\_\_\_\_

Street \_\_\_\_\_ Apt. # \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

A Division of The McGraw-Hill Companies

Accredited Member, Distance Education and Training Council

0141-0299



and a 3Com Fast EtherLink XL network adapter as standard equipment. Toss in a 19-inch monitor, and the \$2399 price is a bargain. As with most corporate PCs, however, a modem costs extra.



Gateway E-4200 450

If you're searching for cutting-edge performance, you had best look elsewhere. This computer's PC WorldBench 98 score of 204 is higher than most PCs', but low for a Pentium II-450.

Though not as stylish as Gateway's G or GP machines, the E-4200 has a nice overall exterior design and easy-to-find ports on the back of the PC. Gateway's VX900 19-inch monitor, combined with ATI's Rage Pro Turbo graphics adapter, displayed clear text and brilliant images.

A chassis intrusion switch alerts IS of forced break-ins, while thumb screws make the case easy for users to open. Our system included five open drive bays, two free DIMM sockets, and three unused expansion slots—more than enough for most upgrade needs. The only major flaw is the location of the memory sockets, which are buried behind the case's internal power cables.

Gateway offers free 24/7 telephone tech support, and its three-year warranty on parts and labor qualifies as one of the most generous in the industry. Gateway's marks in our reliability and service survey were only fair, but in answering our anonymous calls, the company's support reps were knowledgeable, courteous, and helpful.

## New This Month

The following systems made our Power Desktops chart for the first time this month. For brief reviews of previously tested machines on the chart, visit our Web page ([www.pcworld.com/top400](http://www.pcworld.com/top400)).

### 15 QUANTEX QP6/450 SM-4X SE

**PRO:** Excellent speakers and graphics card, attractive software bundle, 4.8X DVD-ROM drive  
**CON:** Mediocre monitor, confusing reset button

Quantex's QP6/450 SM-4x SE takes an entirely different approach from Gateway's corporate-oriented E-4200 450. As part of Quantex's high-end multimedia line, the QP6/450 SM-4x SE should appeal more to power users running their own businesses. Fast graphics, a 4.8X DVD-ROM drive, great speakers, lots of extras, and a moderate \$2499 price distinguish this Quantex system.

But stylish it's not. The large square chassis has a utilitarian look. It also has one annoying feature: It's difficult to tell at first glance which of the two buttons on the front panel is for power and which is for system reset. Clearly, though, Quantex put its dollars behind such

highly desirable extras as a Zip drive, a V.90 56-kbps modem, and a 4.8X DVD-ROM drive. For multimedia tasks, STB's Velocity 4400 graphics board (powered by NVidia's hot TNT chip) gives you great 2D and 3D graphics, and Altec Lansing's ADA305 Digital PowerCube speaker set delivers terrific sound. The one unimpressive component is the 19-inch Quantex monitor, which displayed somewhat pixelated images.

The software bundled with the system targets personal productivity. In addition to Microsoft's Office 97 Small Business Edition, Quantex tosses in packages like Softkey Labels Unlimited and Softkey Day Planner.

If you need to upgrade this PC, getting inside the case is relatively easy, and a generous array of four open slots and five open drive bays is available. There's only one open memory socket, but that should not limit most users, since the system comes with 128MB of RAM.

On the other hand, the documentation included with the QP6-450 SM-4x SE is woefully inadequate. It covers the basics but doesn't drill down any specifics about the machine. If you run into trouble, you'll probably end up calling Quantex's toll-free tech support line, which fortunately is open 24 hours every day of the week. Based on our anonymous calls, the quality of support seems to be adequate.



QP6/450 SM-4x SE

### 17 COMPAQ PROSIGNIA DESKTOP 330

**PRO:** Direct-purchase model from Compaq with unusual service options for small-business support, network interface card and modem

**CON:** Pricy for a direct-purchase system, case requires special tools to open, messy interior  
Compaq aims to distinguish itself amid the crowd of direct vendors by offering the Prosignia Desktop 330. But the main reason most people buy direct is price, and the Prosignia, at \$2429, is no bargain for a direct-purchase system. For a mere \$70 more, Quantex's QP6/450 SM-4x SE has many more high-end components.

True to its business focus, the Prosignia Desktop 330 has a basic configuration: a V.90 56-kbps modem, a crisp 17-inch monitor, a network card, and plenty of memory and hard drive space. The Prosignia's PC WorldBench score of 210 is slightly below average for a Pentium II-450 system.

The Prosignia Desktop 330 also comes with a somewhat unusual list of extra-cost small-business support services, such as online backup, secure online document delivery, and assistance in establishing an online storefront.

Our biggest problem with the Prosignia Desktop 330 is its case design. You need to buy a set of specialized Torx screwdrivers just to get inside. Moreover, the sloppily organized power cables, which are situated next to the I/O slots, make adding DIMMs a chore. In our anonymous calls to Compaq's technical support line, we received adequate advice but had to wait on hold 20 minutes each time. ►

## BEYOND THE TOP 20



We evaluated the following systems along with the others, but they didn't score high enough to reach the *Top 20 Power Desktops* chart. For write-ups, go to PC World Online ([www.pcworld.com/t20pcs](http://www.pcworld.com/t20pcs)).

- ◆ NexTrend NexStar 450 TNT
- ◆ Aberdeen Inverness D27 PII-450
- ◆ Cyberdyne Centron 450 BM
- ◆ Kingdom Pinnacle 450
- ◆ Tagram T5700 PII-450
- ◆ NexTrend NexStar 700



# Mitsubishi Is Changing The Face Of Desktop Monitors.

*The Finesse Of Flat:* Introducing Mitsubishi's Diamond Pro® 900u With The Breakthrough DIAMONDTRON NF™ CRT.

Mitsubishi's new DIAMONDTRON NF (Natural Flat) CRT technology represents an unprecedented improvement in the way you'll look at monitors from this moment on. The revolutionary, truly flat-faced CRT creates distortion-free, intuitively correct images that are much easier on your eyes. Conventional CRTs produce curves and distortions that are hard on your eyes, increasing fatigue and reducing productivity.

DIAMONDTRON NF

CONVENTIONAL FLAT



You've come to expect crisp, clear images from Mitsubishi's award-winning DIAMONDTRON monitors, and now the innovative Diamond Pro 900u takes monitor performance to an even higher level. The Diamond Pro 900u delivers consistently accurate image quality – side to side, center to corner. In addition, Mitsubishi's patented CRT manufacturing process makes the Diamond Pro 900u stay brighter up to twice as long as conventional CRT designs. First in a family of DIAMONDTRON NF monitors, the 19-inch (18.0-inch DVI\*) Diamond Pro 900u has a maximum resolution of 1600 x 1200/75 Hz. For added flexibility it also features a self-powered USB hub that allows two independent computers to share the display and a single set of USB devices. DIAMONDTRON NF monitors are just flat-out better. For more information contact Mitsubishi Electronics today.

USA: 800-843-2515 • Canada: 800-387-9630  
QWIKFAX: 800-937-2094  
[www.mitsubishi-display.com/pb/pwd/900u](http://www.mitsubishi-display.com/pb/pwd/900u)



©1996 Mitsubishi Electronics America, Inc. DIAMONDTRON NF is a trademark of Mitsubishi Electric Corporation. Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation. Mac and the Mac OS logo are trademarks of Apple Computer, Inc. \*DVI (Diagonal Viewable Image)  
Circle 144 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

 **MITSUBISHI**  
DISPLAY PRODUCTS  
*Innovation On Display<sub>sm</sub>*





# Left Field



Way out yonder. Far, far away. Nowheresville. You can now scan and store images anywhere your heart desires with ImageDeck™—Microtek's new Stand-Alone Scanning Appliance™. All you need is a wall socket and something to scan. ImageDeck is a 36-bit, 600 x 600 dpi desktop scanning appliance that features a 100 MB Iomega Zip® Built-in™ drive, as well as a 3.5" floppy drive. Images can easily be transferred to a PC or a Mac. And if you attach your ImageDeck to a color printer, it doubles as a high-resolution color copier. So no matter where you go, there you are—scanning images and making color copies. For more, see us at [www.imagedeck.com](http://www.imagedeck.com).








*The ImageDeck scanning appliance from Microtek. Easy to use. Anywhere.*

**MICROTEK**  
Better Images Through Innovation.  
[www.imagedeck.com](http://www.imagedeck.com)

© 1999 Patent Pending. ImageDeck and Stand-Alone Scanning Appliance are trademarks of Microtek Lab, Inc. All other trademarks or registered trademarks are the property of their respective holders



# TOP 20 BUDGET DESKTOPS

	SYSTEM	Last month	Month tested	Street price (11/20/98)	CPU	Comments
1	 Gateway E-3200 400 800/779-2000 www.gateway.com	2	Dec 98	\$1813	Pentium II-400	Fully manageable corporate PC has network card, great support policies.
2	 Micro Express MicroFlex C400B 800/989-9900 www.microexpress.net	4	Jan 99	\$1699	Pentium II-400	Low price for a PII-400; plenty of RAM, DVD-ROM drive, mediocre monitor.
3	 Micro Express MicroFlex-35A 800/989-9900 www.microexpress.net	1	Dec 98	\$1199	AMD K6-2-350	Moderately fast PC includes robust multimedia components and a great warranty.
4	 Dell Dimension V333c 800/388-8542 www.dell.com	6	Nov 98	\$1629	Celeron-333	Big \$220 cut, but still pricey for its class; Zip drive and 4.8X DVD-ROM drive.
5	 Dell Dimension XPS R350 800/388-8542 www.dell.com	3	Nov 98	\$1899	Pentium II-350	Great all-around PC for small business includes 4.8X DVD-ROM drive.
6	Micron ClientPro 400 888/634-8799 www.micronpc.com	n/a	Oct 98	\$1999	Pentium II-400	Network-ready with built-in management; delivers average PII-400 performance.
7	CyberMax Enthusiast KII 350 800/437-4596 www.cybermaxpc.com	n/a	NEW	\$1149	AMD K6-2-350	Feature-rich PC offers loads of expandability but has a poor monitor.
8	Axis Systems Orion 100R PII-400 800/378-9014 www.axisys.com	7	Jan 99	\$1799	Pentium II-400	Fast PC with 4.8X DVD-ROM gets \$200 price cut, improved tech support.
9	Sys Technology TaskMaster 350K2 800/613-9963 www.sys.com	13	Jan 99	\$1559	AMD K6-2-350	Cut of \$140 on PC that's fast for an AMD K6-2-350; 17X-40X CD-ROM drive.
10	MidWest Micro Office Pro 350 800/728-8582 www.mwmlcra.com	n/a	NEW	\$1499	Pentium II-350	Average-price PC benefits from DVD-ROM drive and strong warranty.
11	Quantex QP6/400 SM-1x 800/896-4898 www.quantex.com	n/a	Sept 98	\$1950	Pentium II-400	Affordable PII-400 with 19-inch monitor and great support.
12	Compaq Deskpro EP C333 800/345-1518 www.compaq.com	9	Nov 98	\$1729	Celeron-333	Well-configured corporate PC is steep for a Celeron-333 system.
13	NEC Direction SP B350 888/863-2669 www.necnow.com	n/a	NEW	\$1299	Pentium II-350	Inexpensive PC is slow for its class, with so-so peripherals; lots of expansion room.
14	IDot.com 450 BX 888/388-4368 www.idot.com	20	Jan 99	\$1798	Pentium II-450	Former Entrepreneur BX450 is \$200 less, now has 32-bit sound, V.90 56-kbps modem.
15	Quantex QP6/400 M-2X 800/896-4898 www.quantex.com	n/a	NEW	\$1949	Pentium II-400	Small-business/home-office PC is multimedia-savvy but pricey; mediocre monitor.
16	Unicent Avanta E333 800/308-3614 www.unicent.com	11	Nov 98	\$999	Celeron-333	Cheapest system on chart could have better phone support.
17	PowerSpec MT 6320 PII-350 888/480-3353 www.powerspec.com	19	Jan 99	\$1298	Pentium II-350	PII-350 packs good speed and includes satisfactory components.
18	Acma NPower 6350 PII-350 800/786-6888 www.acma.com	n/a	NEW	\$1895	Pentium II-350	Corporate PC has Zip drive, network card, and good support; pricey for its CPU class.
19	NextPC N6-350 PII 350 888/838-7827 www.next-pc.com	n/a	Oct 98	\$1429	Pentium II-350	Fast small-office system benefits from \$139 price cut but lacks online support.
20	ProGen Polaris PII-450 888/776-9595 www.progen.com	n/a	Jan 99	\$1499	Pentium II-450	ProGen slashes \$380 off sluggish PC with MS Natural Keyboard and Intellimouse.



Best Buy

See features chart, page 204; test report, page 206.

n/a = not applicable

<sup>1</sup> A system's performance word score is relative to scores of other PCs running the same operating system. For more details see "Your Guide to the Top 100" on page 191.

<sup>2</sup> For more information about all products in this table, select PC World InfoNet no. 907 or visit [www.pcworld.com/infonet](http://www.pcworld.com/infonet).



THIS MONTH'S BUDGET SYSTEMS range in price from the bare-bones, 16th-place Unicent Avanta E333 at \$999 to the Micron ClientPro 400, which barely missed winning a Best Buy at \$1999. Price cuts have turned former power-chart contestants like the ClientPro and the NextPC N6-350 into affordable budget machines. But of the budget Best Buys, only the Micro Express MicroFlex-35A comes in at under \$1600, indicating that cheapness alone won't boost a system to the top. The seventh-place CyberMax Enthusiast KII 350 is our top-rated new system this month, thanks to a big 8.4GB hard disk, a DVD-ROM drive, and a low \$1149 price. Slow performance and a poor monitor keep it from rising higher.



## SCORECARD

★ Overall rating	PC WorldBench 98/operating system	Features and design	Price	Performance <sup>1</sup>	Vendor's system reliability	Vendor's support quality/policies	PC World InfoNet number <sup>2</sup>
83	224/Win NT 4.0	good	expensive	very good	good	fair/outstanding	668
83	204/Win 98	very good	average	very good	3	fair <sup>4</sup> /outstanding	669
83	179/Win 98	good	inexpensive	good	3	fair <sup>4</sup> /outstanding	670
82	170/Win 98	good	average	good	good	good/good	671
82	188/Win 98	good	expensive	good	good	good/good	672
80	228/Win NT 4.0	good	expensive	very good	good	good/good	673
80	161/Win 98	good	inexpensive	satisfactory	3	fair <sup>4</sup> /good	674
80	201/Win 98	very good	expensive	very good	3	fair <sup>4</sup> /good	675
80	181/Win 98	very good	average	good	3	good <sup>4</sup> /good	676
78	181/Win 98	very good	average	good	3	good <sup>4</sup> /good	677
78	199/Win 95	very good	expensive	very good	3	fair <sup>4</sup> /good	678
77	176/Win 98	good	expensive	good	good	fair/outstanding	679
77	170/Win 98	satisfactory	average	good	outstanding	good <sup>4</sup> /good	680
77	218/Win 98	very good	expensive	outstanding	3	good <sup>4</sup> /poor	681
75	199/Win 98	very good	expensive	very good	3	good <sup>4</sup> /good	682
75	171/Win 98	satisfactory	inexpensive	good	3	fair <sup>4</sup> /outstanding	683
74	180/Win 98	good	average	good	3	fair <sup>4</sup> /fair	684
74	188/Win 98	good	expensive	good	3	good <sup>4</sup> /good	685
74	181/Win 95	good	average	good	3	fair <sup>4</sup> /good	686
73	206/Win 98	good	average	very good	3	poor <sup>4</sup> /fair	687
Scorecard weightings ▶		Features 25 percent	Price 22 percent	Performance 18 percent	Reliability 15 percent	Quality/policies 10 percent each	

Insufficient data to give a rating.

<sup>4</sup> Scores were derived from anonymous support-quality calls due to insufficient data from survey.

## This Month's Best Buys

### 1 GATEWAY E-3200 400

**PRO:** Well-supported corporate PII-400 system with easy-access interior

**CON:** Limited expandability, mediocre monitor



Corporate PC buyers looking for a high-quality managed PC for less than \$2000 should seriously con-

sider Gateway's E-3200 400 desktop. For \$1813 you get a network-ready computer that's easy to service and has built-in remote management hardware. Performance isn't the E-3200 400's strongest suit, however. Despite the PC's speedy Pentium II-400 processor and Windows NT 4.0 operating system, it turned in a PC WorldBench 98 score of 224—about 6 percent lower than those of similarly

configured Windows NT-equipped systems, whose scores averaged 234.

But the E-3200 400 compensates for its less-than-thoroughbred gait with smart remote management features and a clever modular design. The motherboard packs DMI 2.0 and Intel LANDesk Client Manager software, which enables IS personnel to monitor the computer remotely. Such



Gateway E-3200 400

powerful management tools make the E-3200 400 a good fit for small companies that want more control over their fleet of PCs and for large businesses looking to outfit an entire division.

The E-3200 400's design also makes it remarkably easy to service. Normally tedious tasks that involve removing the case cover and exchanging a component (whether system memory or the processor) require very little time and very few tools. You have unimpeded access to the memory and expansion slots, and you can even remove and replace the entire motherboard in less than a minute. Best of all, putting the pieces back together is as straightforward as taking them apart. Color-coded cables for the keyboard, mouse, and monitor make it a cinch to get the system running again.

This Gateway's components, though not state-of-the-art, suffice for general business applications. The motherboard integrates a Crystal PnP sound chip and an ATI 3D Rage Pro AGP graphics chip, but you can install an additional 4MB of video memory if you need it. The 17-inch Gateway EV700 monitor offers unremarkable display quality for images and text. But image adjustments are easy enough: A flywheel control lets you change on-screen settings by turning a knob. The E-3200 400 also comes with a pair of unexceptional Altec Lansing GCS speakers, but multimedia isn't a priority for this PC. If you must have better speakers, you can pay \$30 more for the superior Boston Acoustics BA635 sound system.

The PC is backed by a generous three-year warranty on both parts and labor, and by around-the-clock tech support ▶



	SYSTEM	CPU	Operating system	RAM (MB)	Secondary cache (KB)	Hard drive (GB)	Graphics adapter (AGP)	Video RAM (MB/type)	Monitor tube/viewable diagonal (inches)	56-kbps modem protocol
1	Gateway E-3200 400*	Pentium II-400	Windows NT 4.0	64	512	10	integrated ATI 30 Rage Pro	4/SGRAM	17/15.9	not included
2	Micro Express MicroFlex C400B*	Pentium II-400	Windows 98	128	512	10	ATI Xpert@Work	8/WRAM	17/16.1	K56flex
3	Micro Express MicroFlex-35A*	AM0 K6-2-350	Windows 98	64	1024	7.5	Diamond Viper V330	4/SGRAM	17/15.9	K56flex
4	Dell Dimension V333c*	Celeron-333	Windows 98	64	128	8.4	integrated ATI 30 Rage Pro	8/SORAM <sup>2</sup>	17/15.9	x2
5	Dell Dimension XPS R350*	Pentium II-350	Windows 98	64	512	10	STB Velocity 128zx	8/SGRAM <sup>2</sup>	17/16	x2
6	Micron ClientPro 400	Pentium II-400	Windows NT 4.0	128	512	6.4	Diamond Viper V330	4/SGRAM	17/16	not included
7	CyberMax Enthusiast KII 350	AM0 K6-2-350	Windows 98	64	512	8.4	Mpact II AGP	8/RORAM	17/15.8	K56flex
8	Axis Systems Orion 100R PII-400	Pentium II-400	Windows 98	64	512	10	Matrox Millennium G200	8/SGRAM	17/16	V.90
9	Sys Technology TaskMaster 350K2	AM0 K6-2-350	Windows 98	64	512	10.1	Matrox Millennium G200	8/SGRAM	17/15.8	V.90
10	MidWest Micro Office Pro 350	Pentium II-350	Windows 98	64	512	6.4	ATI Xpert@Play 98	8/SGRAM	17/15.8	K56flex
11	Quantex QP6/400 SM-1x	Pentium II-400	Windows 95	64	512	11	Real 3D StarFighter AGP	8/SGRAM	19/18	K56flex
12	Compaq Deskpro EP C333	Celeron-333	Windows 98	64	128	10	Matrox Millennium G200	8/SORAM	17/15.9	K56flex
13	NEC Direction SP B350	Pentium II-350	Windows 98	32	512	4.3	ATI Xpert98	8/SGRAM	15/13.9	K56flex
14	IDot.com 450 BX	Pentium II-450	Windows 98	64	512	10.1	Matrox Millennium G200	8/SGRAM	17/16.1	V.90
15	Quantex QP6/400 M-2X	Pentium II-400	Windows 98	64	512	8.4	Diamond Fire GL 1000 Pro	8/SGRAM	19/17.9	V.90
16	Unicent Avanta E333	Celeron-333	Windows 98	64	128	4	integrated ATI 3D Rage Pro	4/SGRAM	15/13.7	V.90
17	PowerSpec MT 6320 PII-350	Pentium II-350	Windows 98	64	512	6.4	Permedia 2	4/SGRAM	17/15.9	V.90
18	Acma NPower 6350 PII-350	Pentium II-350	Windows 98	64	512	10.1	Diamond Stealth II G460	8/SORAM	17/16	V.90
19	NextPC N6-350 PII 350	Pentium II-350	Windows 95	64	512	8.4	Card Expert Intel740	8/SORAM	17/16	K56flex
20	ProGen Polaris PII-450	Pentium II-450	Windows 98	64	512	8.4	Matrox Millennium G200 AGP	8/SORAM	17/16	V.90

\* Best Buy


<sup>1</sup> PC World defines towers as taller than 20 inches, midtowers as 15.5 inches to 20 inches, and minitowers as shorter than 15.5 inches.

every day of the week. In our survey, readers rated the reliability of Gateway's business systems as good; and in responding to our anonymous calls, the company's representatives provided acceptable answers to our questions.

## 2 MICRO EXPRESS MICROFLEX C400B

**PRO:** Generous amount of memory, 3X DVD-ROM drive, good technical support policies

**CON:** Difficult-to-remove cover, mediocre monitor, outdated documentation

 The Micro Express MicroFlex C400B, formerly known as the C400A, jumps from fourth place to second this month. At \$1699, this Pentium II-400 PC is less expensive than many of its similarly configured peers. It

also comes with solid multimedia features, offers good upgrade potential, and carries generous warranty and tech support policies.

The new MicroFlex earned a PC WorldBench score of 204, which is about average for its processor and price class. But it packs 128MB of memory—double what most comparably priced units have—and such multimedia perks as a 3X DVD-ROM drive, S-video, and RCA cables. It also boasts a MIDI port, along with a set of Altec Lansing PowerCube speakers that are backed by a robust subwoofer and powered by a superior Creative Labs Sound Blaster PCI 128 sound card. The 17-inch Impression 7 Plus monitor is easy to adjust, thanks to



MicroFlex C400B

straightforward hardware controls and a helpful on-screen menu. In our tests, text and graphics looked sharp, but the corners of the screen tended to be fuzzy.

Upgrading the system is easy. But as with most MicroFlex mid-towers, getting inside means you must remove four screws and then lift off an awkward three-sided cover. Once you've cracked the case, you'll find plenty of room to move around in—and no nasty cable clutter. Unfortunately, putting the cover back on is as inconvenient as taking it off. You get numerous manuals with the system, but the outdated owner's guide, designed for Windows 3.1 users, contains nary a word about Windows 98.



## EXPANDABILITY

## CUSTOMER SUPPORT

CD/DVD-ROM drive speed	Sound board	Case style <sup>1</sup>	Max. RAM (MB)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
13X-32X	integrated Crystal PnP	desktop	384	2	1/1	1	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
3X DVD-ROM	Sound Blaster PCI 12B	midtower	384	1	3/0	4	4/4	24	Sat., Sun.	WWW
12X-32X	Sound Blaster PCI 12B	midtower	384	4	3/0	4	4/4	24	Sat., Sun.	WWW
4.8X DVD-ROM	Turtle Beach Montego	minitower	384	2	2/1	1	3/1	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
4.8X DVD-ROM	integrated Crystal PnP	midtower	384	2	3/1	4	3/1	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
20X-32X	integrated Crystal PnP	midtower	384	2	3/1	4	varies <sup>3</sup> /1	24	Sat., Sun.	BBS, CIS, WWW
2X DVD-ROM	Sound Blaster AWE64	midtower	256	1	3/3	4	3/1	24	Sat., Sun.	BBS, WWW
4.8X DVD-ROM	Sound Blaster PCI 12B	midtower	384	2	2/0	4	3/3	24	Sat., Sun.	WWW
17X-40X	Sound Blaster AWE64	midtower	768	2	3/2	4	3/5	24	Sat., Sun.	WWW
4.8X DVD-ROM	Sound Blaster AWE64D	midtower	768	2	3/1	4	varies <sup>3</sup> /3	24	Sat., Sun.	BBS, WWW
12X-32X	Ensoniq AudioPCI	midtower	384	2	3/3	3	3/1	24	Sat., Sun.	BBS, WWW
12X-32X	Compaq Premiere Labs	desktop	256	1	1/1	3	3/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
14X-32X	integrated Crystal PnP	midtower	384	2	3/0	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
17X-40X	Aztech PCI 33BA-3D	midtower	384	2	3/0	4	varies <sup>3</sup> /1	24	Sat., Sun.	WWW
4.8X DVD-ROM	Creative Audio PCI 64V	minitower	384	1	2/3	3	3/1	24	Sat., Sun.	WWW
12X-24X	integrated Yamaha OPL3-Sax	minitower	256	1	2/0	2	3/3	24	Sat., Sun.	BBS, WWW
12X-32X	integrated ESS Maestro2 PCI	minitower	384	2	2/0	2	1/1	17	Sat., Sun.	BBS
13X-32X	Sound Blaster PCI 12B	midtower	384	2	1/0	2	3/1	24	Sat., Sun.	BBS, WWW
14X-36X	integrated Ensoniq AudioPCI	midtower	768	2	2/3	5	3/3	24	Sat., Sun.	none
14X-32X	Aureal Vortex PCI Audio	minitower	384	2	1/1	0	3/1	12	none	BBS, WWW

<sup>2</sup> Tested with BMB of video RAM, now comes standard with 16MB.

<sup>3</sup> Five years on CPU and main RAM, three years on other parts.

Micro Express backs the MicroFlex C400B with an exceptionally long four-year warranty on both parts and labor and provides free 24-hour telephone technical support every day of the week.

### 3 MICRO EXPRESS MICROFLEX-35A

**PRO:** Neat interior, long warranty, good speakers

**CON:** Case is hard to open

Though it features a great interior design, a good audio subsystem, and a lengthy warranty, Micro Express's MicroFlex-35A couldn't hold its number one position for a second month. Nevertheless, Micro Express's MicroFlex-35A continues to offer the budget-conscious power user high-quality components, impressive performance, and

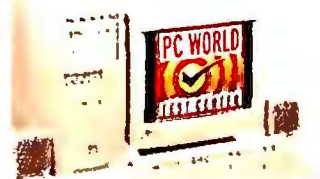
an extremely attractive \$1199 price.

You would pay approximately \$400 more for a comparably equipped computer powered by a Pentium II-350 processor. But opting for the bargain doesn't mean that you have to sacrifice speed. Inside the MicroFlex-35A's plain beige midtower case lies a 350-MHz K6-2 processor, the fastest yet from AMD. The system's PC WorldBench score of 179 equals that of an average Pentium II-350 system.

Despite its modest price, the MicroFlex-35A doesn't skimp on hardware. The combination of a 7.5GB hard disk, a 56-kbps modem, and a 12X-32X CD-ROM drive make it suitable for most business applications. And if you build

heavy-duty multimedia presentations, the included Diamond Viper V330 graphics card won't disappoint. The Viper series has fared well on our *Top 10 Graphics Boards* chart. The MicroFlex-35A's sound system is also powerful: Creative Labs' standard Sound Blaster PCI 128 audio card surrounds you with sound when it's connected to a four-speaker audio system. The card doesn't quite match Altec Lansing's ACS44 PowerCube speaker setup—two tiny but powerful cubic satellites and a subwoofer half the size of the midtower—but it still delivers great sound.

Though text and graphics images appeared crisp on the 17-inch Impression 7V color monitor, the display ►



MicroFlex-35A



made a poor impression on us: The monitor we reviewed had a bluish cast we couldn't eliminate. The MicroFlex-35A's interior is so neat and well-organized you'd think that a drill sergeant had designed it. If only getting inside were simpler. You have to remove four Phillips-head screws, and then lift off the three-sided steel case. Reseating the cover is even trickier; we had trouble aligning it and sliding it securely back into place.

The MicroFlex-35A comes with numer-

ous helpful manuals, and Micro Express backs its systems with an above-average four-year warranty on parts and labor, including one year of free on-site service. Toll-free phone support is available around the clock. In answers to our anonymous calls, Micro Express's technicians were helpful. They answered our easy-to-intermediate questions accurately and succinctly, but didn't bother to explain the particulars in their responses to our more difficult questions.

#### 4 DELL DIMENSION V333C

**PRO:** Speed on a par with PII-333 machines, includes Zip drive and 4.8X DVD-ROM drive

**CON:** Still not a great bargain, even following a \$220 drop in price



Dell's Dimension V333c is a small-business machine with multimedia on its mind. The Celeron-333 processor at the heart of this system helped it achieve a PC WorldBench 98 score of 170, which is competitive with PII-333 systems. But even after Dell pared

### TOP 20 BUDGET DESKTOPS

### TEST REPORT

	SYSTEM	CPU	Operating system	RAM (MB)	Secondary cache (KB)	PC WorldBench 98 score	Faster	Average of tested Pentium II-350s <sup>1</sup>
1	Gateway E-3200 400*	Pentium II-400	Win NT 4.0	64	512	224		
2	Micro Express MicroFlex C400B*	Pentium II-400	Win 98	128	512	204		
3	Micro Express MicroFlex-35A*	AMD K6-2-350	Win 98	64	1024	179		
4	Dell Dimension V333c*	Celeron-333	Win 98	64	128	170		
5	Dell Dimension XPS R350*	Pentium II-350	Win 98	64	512	188		
6	Micron ClientPro 400	Pentium II-400	Win NT 4.0	128	512	228		
7	CyberMax Enthusiast KII 350	AMD K6-2-350	Win 98	64	512	161		
8	Axis Systems Orion 100R PII-400	Pentium II-400	Win 98	64	512	201		
9	Sys Technology TaskMaster 350K2	AMD K6-2-350	Win 98	64	512	181		
10	MidWest Micro Office Pro 350	Pentium II-350	Win 98	64	512	181		
11	Quantex QP6/400 SM-1x	Pentium II-400	Win 95	64	512	199		
12	Compaq Deskpro EP C333	Celeron-333	Win 98	64	128	176		
13	NEC Direction SP B350	Pentium II-350	Win 98	32	512	170		
14	IDot.com 450 BX	Pentium II-450	Win 98	64	512	218		
15	Quantex QP6/400 M-2X	Pentium II-400	Win 98	64	512	199		
16	Unicent Avanta E333	Celeron-333	Win 98	64	128	171		
17	PowerSpec MT 6320 PII-350	Pentium II-350	Win 98	64	512	180		
18	Acma NPower 6350 PII-350	Pentium II-350	Win 98	64	512	188		
19	NextPC N6-350 PII 350	Pentium II-350	Win 95	64	512	181		
20	ProGen Polaris PII-450	Pentium II-450	Win 98	64	512	206		

\*Best Buy

Application test times in minutes

0

10

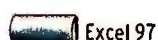
20



Word 97



Word Pro 97



Excel 97



1-2-3 97



Paradox 8.0



Picture Publisher 7.0



**TEST HOW WE TEST** All systems are tested with PC WorldBench 98, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs are tested with Windows 95, Windows 98, or Windows NT 4.0, and video resolution is set to 800 by 600 in 65,536 colors. We run automated scripts on six popular business applications, performing common tasks such as spelling checks, scrolls, saves, sorts, and recalculations. The PC WorldBench 98 score is a sum of the weighted, normalized result of each script: Word 97 (10 percent), Word Pro 97 (10 percent), Excel 97 (20 percent), 1-2-3 97 (20 percent), Paradox 8.0 (20 percent), and Picture Publisher 7.0 (20 percent). For more details on our benchmark and how we run it, see PC World Online ([www.pcworld.com/testing](http://www.pcworld.com/testing)). <sup>1</sup>Under Windows 98.



\$220 off its price tag, the \$1629 V333C remains more expensive than its Celeron-333-powered peers—probably due to

multimedia extras including a Zip drive and a 4.8X DVD-ROM drive.

Dell's setup and user guides are comprehensive,

and color-coded cables that match the well-labeled ports on the back of the case make initial setup a no-brainer. The warranty on this system is the same as for all Dimensions: Parts are covered for three years, labor for one. Toll-free technical support is available 24 hours every day of the week. In responses to our anonymous tech support calls, representatives answered our questions adequately.

## 5 DELL DIMENSION XPS R350

**PRO:** Ties for fastest PII-350 we've tested, DVD-ROM drive, huge hard disk, Trinitron monitor

**CON:** Pricey, case is difficult to open

Dell's \$1899 Dimension XPS R350 comes with all the goodies you'll find in more expensive peers. And this Pentium II-350 turns in a PC WorldBench score of 188, tying it for first among systems we've tested in its processor class.

The system includes a robust 10GB IBM ATA-33 hard disk, an Iomega Zip drive, and a 4.8X DVD-ROM drive. The stunning 17-inch Trinitron monitor, fast STB Velocity 128zx graphics card, and hardware-based MPEG 2 decoder deliver blazing graphics and video. The software bundle, anchored by Microsoft Office Small Business Edition, is all business.

The XPS R350's midtower case includes a platform base for extra stability, but the side panel is hard to remove. The well-arranged interior includes a fan that blows air directly onto the heat sink.

Dell's helpful documentation includes a foldout setup guide and troubleshooting manuals. Our readers rate Dell's 24-hour toll-free tech support as good. Reps were polite during our anonymous calls, but unwilling to help us without



Dell Dimension XPS R350

system identification numbers. Additionally, they gave incorrect advice when we asked difficult questions about FAT32 and updating drivers.

## New This Month

The following systems made our Budget Desktops chart for the first time this month. For brief reviews of previously tested machines on the chart, visit our Web page ([www.pcworld.com/top400](http://www.pcworld.com/top400)).

### 7 CYBERMAX ENTHUSIAST KII 350

**PRO:** Great set of features for the price

**CON:** Poor monitor quality

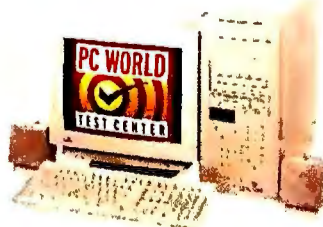
It's astounding how much computer a little over a grand will buy you these days. For just \$1149, CyberMax's Enthusiast KII 350 offers such features as a DVD-ROM drive and a 17-inch monitor along with plenty of expandability and acceptable performance.

The Enthusiast, powered by AMD's K6-2-350 processor, scored 161 on our PC WorldBench 98 test suite, on a par with systems running on Pentium II-300 CPUs. Its performance is also about average for computers priced under \$1200—so speed shouldn't be your first, or even second, priority if you are considering this machine.

The 17-inch CyberMax monitor bundled with this PC disappointed us. Displayed images lacked crispness, and colors seemed a bit dull. The system's sound quality, on the other hand, was quite pleasing, thanks in part to the Altec Lansing ACS 45.1 speaker and subwoofer combination. If you like to listen to music through your PC while you work, these speakers are a fine choice.

Open drive bays and adapter slots abound inside this midtower. Once we removed the screws and the sturdy casing, we found a spacious interior—and a tangle of wires. But we also found six free drive bays and four open expansion slots.

The Enthusiast ships with



Enthusiast KII 350

both a quick setup guide and a thorough system manual to get you up and running. CyberMax backs its systems with a warranty of three years on parts and one year on labor. Technical support representatives are available around the clock.

### 10 MIDWEST MICRO OFFICE PRO 350

**PRO:** DVD-ROM drive, comprehensive warranty

**CON:** Undersize keyboard

If you're in the market for a versatile small-business or home-office system, MidWest Micro's newly reconfigured Office Pro 350 may hit the spot. At \$1499, it qualifies as the lowest priced Pentium II-350-powered PC we've seen with a 4.8X DVD-ROM drive, and is a good \$100 less than the average Pentium II-350 system. With a PC WorldBench 98 score of 181 (at the median for its configuration) it

commands excellent performance for the price. Microsoft's Office 97 Small Business Edition is included in the package, enabling you to get up and working quickly.

Whether you display text or graphics, the Office Pro 350 more than holds its own. The 17-inch Clearmax CM-1726 monitor, in association with the ATI Xpert@Play 98 graphics adapter, gives a sharp picture even at 1280 by 1024 resolution. The ATI adapter nicely supports Toshiba's latest-generation 4.8X DVD-ROM drive. Finally, Altec Lansing's ADA 305 Digital PowerCube speakers round out this strong multimedia package.

The easy-to-open midtower case houses four free drive bays, four open expansion slots, and two unused DIMM sockets—all with unobstructed access. In fact, just about the only main thing we disliked about this system was its small, difficult-to-use keyboard.

MidWest Micro provides a longer-than-average parts and labor warranty along with unlimited 24-hour telephone technical support. Our anonymous calls to MidWest Micro's support line were an- ▶



Office Pro 350



swered by knowledgeable representatives who went the extra mile to help us, making sure we understood their answers to our more difficult questions.

### 13 NEC DIRECTION SP B350

**PRO:** Inexpensive, plenty of room for expansion, good support

**CON:** Slow for its processor class; small hard drive and monitor, limited RAM

NEC's Web site touts the Direction SP B series as "superior performance systems for the power enthusiast." Speed-hungry users should look elsewhere, however. The SP B350's PC WorldBench score of 170 makes it the slowest Pentium II-350 system we've ever encountered; it trails

the average PII-350 by 8 percent.

Performance aside, the Direction SP B350 is a no-frills system



NEC Direction SP B350

with a relatively low price of \$1299. No frills means a petite 4.3GB hard drive, 32MB of RAM, and a 15-inch monitor. That's downright lilliputian compared to other Pentium II-350 systems we've seen, which typically carry at least a 6.4GB hard drive, 64MB of RAM, and a 17-inch monitor.

The Direction heads the right way on several fronts, though, with three free PCI slots, one free ISA/PCI slot, and a clean, easy-to-access interior. And NEC systems earned an outstanding reliability score in our recent subscriber survey.

### 15 QUANTEX QP6/400 M-2X

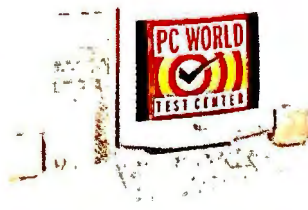
**PRO:** Generous software bundle, built-in Zip drive, 4.8X DVD-ROM drive, and V.90 56-kbps modem

**CON:** Somewhat outdated graphics card; insufficient system documentation

You won't mistake Quantex's \$1949 QP6/400 M-2X for an overachiever: Its price, performance, and features are all middling for its class.

Highlights include a built-in Zip drive, a 4.8X DVD-ROM drive, a V.90 56-kbps modem, and an 8.4GB hard disk.

Quantex seems to have used the grab-bag approach in selecting components for this general-use system. For instance, the



Quantex QP6/400 M-2X

Diamond Fire GL 1000 Pro graphics card in our review unit, despite using latest-generation technology, doesn't rate as one of the stronger boards for after-hours gaming. On the other hand, the system offers sound good enough to challenge some stereo systems, and a stack of useful software including Corel's Office Suite 8, Compton's Interactive Encyclopedia, and the American Heritage Talking Dictionary.

Getting inside the system for upgrades proves easy—just turn three thumbscrews and pull. But once you're in, you'll have to push some of the clutter aside to access any of the three free card slots or the one free DIMM socket.

Unfortunately, if you experience any problem with an upgrade, the system manual won't offer much help. The user guide includes lots of information on system tools, viruses, and multimedia, but it doesn't outline the system design or cover basic system setup. Thankfully, Quantex offers toll-free technical support around the clock, and its courteous reps provide good support. All of our anonymous calls were answered in less than 10 minutes. Quantex backs its systems with a three-year parts, one-year labor warranty.

### 18 ACMA NPOWER 6350 PII-350

**PRO:** Well-designed for the office; Zip drive; network card and modem; remote management

**CON:** Pricey for a Pentium II-350; second-rate graphics card and speakers

Most corporate computers on the market come from giant vendors like Compaq, Dell, and IBM. But there are some little-guy exceptions, like Acma. This company's NPower 6350 PII-350 supports DMI 2.0 remote along with a good array of special features. As with most corporate systems, however, you pay a premium for the business-oriented profile. The average Pentium II-350 machine costs \$200 less than the \$1895 NPower.

With a PC WorldBench 98 score of 188, the NPower 6350 PII-350 won't leave many of its users suffering from performance anxiety. Among similarly config-

ured systems running Windows 98, the NPower earns one of the top speeds.

Office-minded extras include both a network interface card and a V.90 56-kbps modem, and, for added storage, a Zip drive (though the system comes with a voluminous 10.1GB hard drive). As is the

case with many business-focused systems, the NPower's perks don't extend to state-of-the-art multimedia components such as a DVD-ROM drive—instead, you get a 13X-32X CD-ROM drive.

The 17-inch monitor displays crisp, rich color, but the Diamond Stealth II G460 graphics card is outmoded. Audio is so-so—you probably won't be happy playing one of Mozart's concertos through the SoundBlaster SBS50 speakers—but it will suffice for the workplace.

There's no need for your IS department to padlock the Acma NPower 6350 PII-350's case—taking the top off requires that two people simultaneously push on two tabs in the lower corners of the case and pull at the chassis. But once inside the machine, you shouldn't have any trouble accessing the two free card slots or two free DIMM sockets. The NPower limits your peripherals, however, by including only one free drive bay. This means that, for example, you can't add both a hard drive and a tape backup unit.

Acma backs its systems with a fairly standard three-year parts, one-year labor warranty and unlimited toll-free technical support around the clock. The quality of support seems to be high; in answering our anonymous calls, the company's technicians provided us with quick, direct, and helpful answers to our intermediate and difficult questions. ▶

### BEYOND THE TOP 20



We evaluated the following systems along with the others, but they didn't score high enough to reach the *Top 20 Budget Desktops* chart. For write-ups, go to PC World Online ([www.pcworld.com/t20pcs](http://www.pcworld.com/t20pcs)).

- ◆ Axis Systems Metropolis Gx3 PII-350
- ◆ Sys Technology Performance 333c
- ◆ Tagram TA 3500 AMD K6-2-333



# GET REAL

Real Solutions...

Real Value...

Real People...



*Computing Solutions  
Built for Business™*

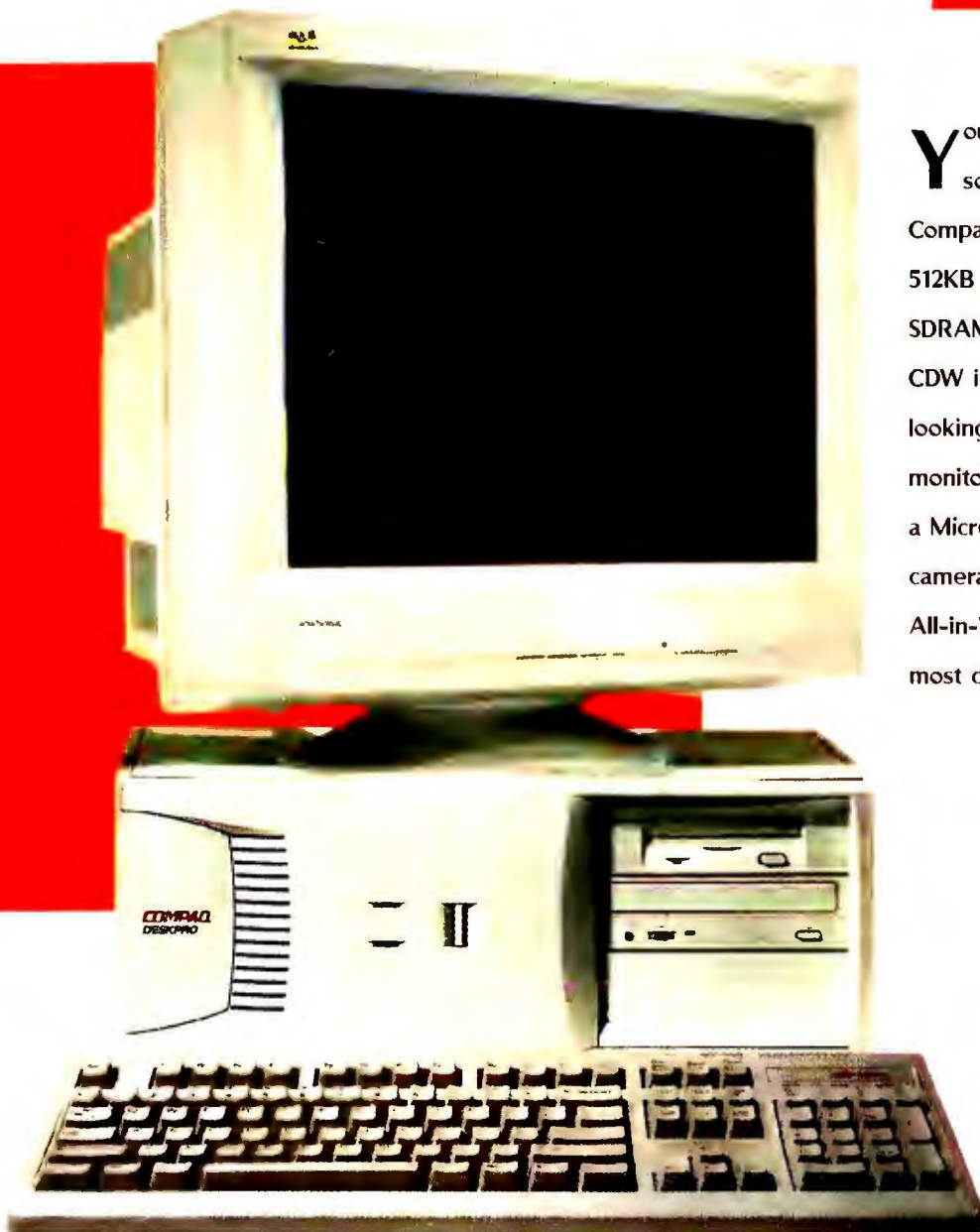
**800-306-4239  
[www.cdw.com](http://www.cdw.com)**

Circle 47 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



Desktop publishing  
made easy

# REAL



Monitor sold separately

**Y**ou need a custom-built solution and nobody knows computing solutions better than your CDW® account manager. Start with a Compaq Deskpro EP desktop with a 350MHz Intel Pentium® II processor, 512KB Level 2 cache, 100MHz Front Side Bus Technology (FSB), 64MB SDRAM, 6.4GB SMART II Ultra-ATA hard drive and 24X Max CD-ROM. CDW is your #1 authorized direct source for Compaq products! If you're looking for high-quality color images and output, consider a ViewSonic monitor with a 19" SuperClear screen display, 18" viewable image size and a Microtek scanner. Complete this great desktop solution with a digital camera from Kodak Digital Science, Adobe's GraphicStudio and ATI's All-in-Wonder Pro. CDW will install your hardware free of charge and in most cases, ship your order the very same day. Call now!

## COMPAQ

Deskpro EP

**\$1114.35\*** CDW 113190

\*While supplies last

### Desktop Publishing Options

**ViewSonic®**

PS790  
19" color  
monitor  
with short 15"  
monitor depth  
**\$549.95**  
CDW 114966

**Simple  
TECHNOLOGY**

64MB RAM  
upgrade  
For Compaq  
Deskpro EP series  
**\$157.55**  
CDW 115517

**Adobe**

GraphicStudio  
Includes Illustrator,  
Photoshop and  
PageMaker  
**\$947.89**  
CDW 131861

**ATI**

All-in-Wonder  
Pro  
**\$154.52**  
CDW 115299

**MICROTEK**  
Better Images Through Innovation

ScanMaker  
X6EL  
36-bit color  
scanner  
**\$228.95**  
CDW 130774

**Kodak®** SOLUTIONS  
digital science

DC210 Plus  
Digital  
Camera  
**\$499.00**  
CDW 126687

**GET  
REAL**

**800-306-4239**  
**www.cdw.com**



# SOLUTIONS

## Take your show on the road

**D**eliver your ideas with power! Let CDW® customize a PC solution for your mobile lifestyle and we'll help you make the world your office. The Toshiba Satellite 4010CDT notebook offers optimum performance featuring a 266MHz Intel Pentium® II processor, 32MB RAM, 4GB hard drive, 24X Max CD-ROM drive, 12.1" active-matrix display and 56Kbps (K56flex) modem. A notebook case from Targus is the perfect way to carry and protect your notebook. Turn your bright ideas into brilliant presentations with Microsoft's PowerPoint 97 then use NEC's portable projector to display those powerful presentations when you are on the road. Call CDW for all of your mobile computing needs.

Your CDW account manager is constantly trained on new technology and can suggest real solutions to meet your various needs and changing situations. CDW is the country's #1 direct solutions provider. We specialize in networking solutions, delivering more than 10,000 server solutions annually.



### TOSHIBA

Satellite

4010CDT

**\$1798.88**

CDW 128704

### Mobile Presentation Options



NEC Technologies

MultiSync LT80

Portable projector

**\$4128.99**

CDW 110037

**Simple**  
TECHNOLOGY

32MB memory upgrade

For Toshiba Satellite 4010CDT

**\$91.57**

CDW 126677



Universal Notebook  
Case

**\$69.99**

CDW 19486

**Microsoft®**

PowerPoint 97

For Windows 95 and NT  
Workstation

**\$298.81**

CDW 81952

## Share information more effectively

### Server Options

**3Com®** Superstack II  
Switch 3300

10/100 Ethernet switches

12-port **\$1415.14** CDW 112158

24-port **\$2202.13** CDW 106636



1601 Router

**\$1139.17**

CDW 85693

**Y**our dedicated CDW® network account manager is trained to determine which solutions are the right ones for you and your business. Cisco's 1601 Router connects small offices with Ethernet LANs to the Internet and company intranets using several wide-area-network technologies.

Try the Superstack II Switch 3300 from 3Com with its matrix port for high-speed connections between switches. Extend your server's performance with the Compaq Prosignia 740 server, featuring a 450MHz Intel Pentium® II processor, 64MB ECC SDRAM and 4.3GB hard drive. CDW provides toll-free technical support for the life of your equipment. Call today and see why nobody does service better than CDW.

Prosignia  
740 server

**\$2743.41**

CDW 136553



Computing Solutions  
Built for Business™

**800-306-4239**

**www.cdw.com**

All products sold by CDW are third party products and are subject to the warranties and representations of the applicable manufacturers, including but not limited to Y2K compliance. Accordingly, CDW makes no representation or warranty with respect to the Y2K compliance of products sold. 56K modems are capable of 56Kbps downloads, however, current regulations limit download speed to 53Kbps. Internet connectivity requires access services from an Internet access provider. Contact your local access provider for rates, terms and conditions.

©1999 CDW® Computer Centers, Inc. 200 N Milwaukee Avenue, Vernon Hills, IL 60061 PCW4369E 2/99

**Circle 46 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)**



# TOP 10 NOTEBOOK PCs

POWER NOTEBOOK		Last month	Month tested	Street price (11/20/98)	CPU	Comments
1	 Dell Latitude Cpi D300XT 800/388-8542 www.dell.com	1	Nov 98	\$3148	Pentium II-300	Thin laptop rides a \$251 price drop to a fourth straight month as Best Buy.
2	Gateway Solo 2500LS 800/315-2536 www.gateway.com	2	Nov 98	\$3074	Pentium II-300	Notebook with strong battery and fixed CD-ROM and floppy drives sheds \$125.
3	WinBook XL2 800/965-9349 www.winbook.com	4	Jan 99	\$3199	Pentium II-300	Presentation unit features huge screen, AGP bus, LS-120 disk drive.
4	Dell Inspiron 7000 D300GT 800/388-8542 www.dell.com	3	Nov 98	\$3499	Pentium II-300	Stellar multimedia notebook now \$50 less; weight restricts it to desktop use.
5	Toshiba Tecra 8000 800/867-4422 www.toshiba.com	5	Nov 98	\$3499	Pentium II-266	Light magnesium interior frame makes portable a worthy road machine.
BUDGET NOTEBOOK						
1	 Unicent Voyager 1212 800/308-3614 www.unicent.com	n/a		\$1899	Pentium II-266	Great deal on a speedy and light notebook that is ideal for travel.
2	Gateway Solo 2500SE 800/315-2536 www.gateway.com	1	Sept 98	\$1999	Pentium II-233	Light laptop with built-in drives performs well on the road or on your desktop.
3	Gateway Solo 3100SE 800/315-2536 www.gateway.com	2	Jan 99	\$2499	Pentium II-233	You pay a premium for this very light, thin notebook designed for travel.
4	Micron GoBook 2 Z66 888/634-8799 www.micronpc.com	3	Nov 98	\$2498	Pentium II-266	Uniquely designed two-layer traveler has several battery and weight options.
5	AMS Tech Roadster 15CTA 800/258-2088 www.amstech.com	4	Jan 99	\$1395	AMD K6-2-300	Low-cost notebook with bright screen and good performance now \$100 less.



Best Buy

See features chart, page 214.

n/a = not applicable

<sup>1</sup>Includes computer; adapter; power cord; and floppy, DVD-ROM, or CD-ROM drive.<sup>2</sup>For more about products here, select the number on the product information card or visit [www.pcworld.com/infonet](http://www.pcworld.com/infonet).<sup>3</sup>Insufficient data to give a rating.

FOR THE FOURTH month in a row, Dell's Latitude Cpi D300XT reigns atop the power notebook chart. It's not the first time a Dell system has enjoyed a long run as a Best Buy, even though the company's notebooks are no more cutting-edge than those from other vendors. High scores in reliability and service—two categories our readers value greatly—help keep Dell on top.

To be sure, we occasionally hear from a reader who's hopping mad about a Dell support fumble. But in our surveys, the latest of which polled more than 6800 *PC World* readers, Dell consistently ranks among the vendors with the largest percentage of satisfied customers. For the Latitude line, the company offers one of the best support packages, including a three-year warranty on parts. Notebooks in Dell's Inspiron line, which also appear regularly on our charts, are backed for three years on labor, too. Only Gateway comes close to matching Dell's record.

On the budget chart we have a new Best Buy, a lightweight Pentium II-266 from Unicent. The only one of nine new note-

books tested this month to earn a spot on our list, the \$1899 Voyager 1212 is an outstanding performer for the price.

## AGP GOES PORTABLE

A YEAR AFTER becoming standard equipment in Pentium II desktops, the Accelerated Graphics Port—a bus designed to improve computer graphics—is beginning to appear on some high-end notebooks. Does AGP make a difference? In our informal tests (for details about these, see *PC World Online*, [www.pcworld.com/nov98/agpnotes](http://www.pcworld.com/nov98/agpnotes)), notebooks equipped with AGP rendered both 2D and AGP-optimized 3D graphics, such as bar and pie charts used in presentations, much more

smoothly than laptops that transferred graphics data through the older PCI bus. Programs launched faster, and 3D graphics lost the jerky, pixelated appearance familiar to users of PCI-based notebooks. But the improvements aren't due to the bus alone: AGP-equipped notebooks usually come packed with lots of video RAM, faster processors, and bigger hard drives. Though many AGP portables are too expensive at the moment to gain widespread acceptance, they'll eventually become the standard. And so will good-looking 3D applications on the go.

But not all advances are as welcome. For example, we're sorry to say good-bye to energy-efficient Pentium MMX mobile chips; they'll be replaced very soon by a new generation of power-hungry Intel CPUs. Intel claims most notebook users are willing to sacrifice battery life for power. What do you think? Frustrated by the few hours you get off a battery charge? Ever get to a presentation and find yourself powerless? Send us your dead battery stories at [vince\\_bielski@pcworld.com](mailto:vince_bielski@pcworld.com).



# SCORECARD

★ Overall rating	PC WorldBench 98 score/performance	Price	Vendor's system reliability	Features and design	Vendor's support quality/policies	Battery life (hours:min)/rating	Traveling weight <sup>1</sup>	PC World InfoNet number <sup>2</sup>
90	159/outstanding	average	good	very good	good/good	3:05/good	average	610
87	158/outstanding	average	good	very good	good/fair	4:09/very good	heavy	611
87	164/outstanding	average	fair	very good	good/poor	2:22/satisfactory	heavy	612
86	162/outstanding	average	good	very good	good/fair	3:37/good	unacceptable	613
85	154/very good	average	good	very good	good/fair	2:42/satisfactory	light	614
Power scorecard weightings ▶	Performance 22 percent	Price 14 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent	
86	149/outstanding	inexpensive	3	very good	adequate <sup>4</sup> /poor	3:22/good	light	615
85	125/good	average	good	good	good/fair	3:15/good	light	616
84	138/very good	expensive	good	very good	good/fair	2:47/satisfactory	very light	617
84	144/outstanding	expensive	fair	very good	good/fair	5:44/outstanding	heavy	618
84	122/good	very inexpensive	3	good	good <sup>4</sup> /fair	2:35/satisfactory	average	619
Budget scorecard weightings ▶	Performance 14 percent	Price 22 percent	Reliability 22 percent	Features 16 percent	Support 10 percent	Battery life 8 percent	Weight 8 percent	All products: 902

<sup>1</sup>Score was derived from anonymous support-quality calls due to insufficient data from survey.


## This Month's Best Buys

### POWER NOTEBOOKS

#### 1 DELL LATITUDE CPi D300XT

**PRO:** Very fast; excellent keyboard

**CON:** Modem not included

 Another price drop, this time to a reasonable \$3148, seals this corporate-targeted notebook's place at the top of our power chart for another month. A pleasure to use, the Latitude CPi D300XT earned a PC WorldBench score of 159, placing it among the fastest notebooks we've ever tested.

As with its predecessor, the nearly identical Latitude CPi D266XT, the D300XT's pleasing charcoal-gray case measures 1.75 inches thick (a little thinner than the current notebook standard of 2 inches) and includes one modular bay on the side. Weighing in at 7.4 pounds and offering slightly more

than 3 hours of battery life, the D300XT is more than adequate for work away from the office. You can increase its travel life by buying the optional \$169 second battery and using two batteries at once.

The Latitude CPi D300XT comes with a responsive, accurate touchpad and an excellent keyboard. Its adequate-size keys offer crisp action and occupy the expected positions, so adapting from a desktop keyboard to the D300XT's is a breeze. And you shouldn't have to worry about upgrading the unit's hard drive any time soon: At

6.4GB, it's one of the largest notebook hard drives currently available.

The CPi D300XT's brilliant screen produces a sharp image from edge to edge. We do have one gripe with the casing around the display, though: It's wider at the top of the screen, so when the lid is closed, it protrudes slightly over the edge of the notebook's case. As a result, if the portable should ever fall onto its side, the fragile

screen would absorb much of the shock.

As with most notebooks, the D300XT's built-in stereo speakers yield tinny sound. But MIDI music sounds better thanks to a software wavetable synthesizer.


Though Dell generally earns high service and reliability marks from *PC World* readers, we've sometimes encountered long waits during our anonymous calls to its technical support line.

### BUDGET NOTEBOOKS

#### 1 UNICENT VOYAGER 1212

**PRO:** Fastest notebook under \$2000 on chart, long-lasting battery, lightweight

**CON:** Basic design, generic documentation, short support hours, frail keyboard

 Unicent, a direct marketer that made a name for itself with its supercheap desktop systems, now tops our budget notebooks chart with the phenomenally inexpensive Voyager 1212.

We've practically never seen a Pentium II-266 laptop with active-matrix screen and 4GB hard drive selling for less ▶



Dell Latitude CPi D300XT



	POWER NOTEBOOK	CPU	Traveling weight (pounds)	RAM (MB)	Hard drive (GB)	Color screen type	Screen diagonal (inches)	Screen resolution	Maximum screen colors	Battery type	Pointing device
1	Dell Latitude CPi D300XT*	Pentium II-300	7.4	64	6.4	active	13.3	1024 x 768	262,144	lithium ion	touchpad
2	Gateway Solo 2500LS	Pentium II-300	8.3	64	4	active	13.3	1024 x 768	65,536	lithium ion	touchpad
3	WinBook XL2	Pentium II-300	8.0	128	6	active	14.1	1024 x 768	16.8 million	lithium ion	touchpad, eraserhead
4	Dell Inspiron 7000 D300GT	Pentium II-300	9.7	64	8	active	14.1	1024 x 768	16.8 million	lithium ion	touchpad
5	Toshiba Tecra 8000	Pentium II-266	7.2	64	6.1	active	13.3	1024 x 768	262,144	lithium ion	eraserhead
<b>BUDGET NOTEBOOK</b>											
1	Unicent Voyager 1212*	Pentium II-266	7.3	64	4	active	12.1	800 x 600	16.8 million	lithium ion	touchpad
2	Gateway Solo 2500SE	Pentium II-233	7.1	32	2.1	active	12.1	800 x 600	262,144	lithium ion	touchpad
3	Gateway Solo 3100SE	Pentium II-233	6.1	64	4	active	12.1	800 x 600	16.8 million	lithium ion	eraserhead
4	Micron GoBook 2 266	Pentium II-266	8.3	64	3	active	12.1	800 x 600	16.8 million	lithium ion	touchpad
5	AMS Tech Roadster 15CTA	AMD K6-2-300	7.9	32	2.1	active	12.1	800 x 600	16.8 million	NiMH	touchpad

\*Best Buy ● Yes ○ No

†Includes computer; adapter; power cord; and floppy, DVD-ROM, or CD-ROM drive.

‡One year on battery.

than two grand. So the \$1899 Voyager is a nice choice for individuals or small businesses on a budget, especially when you consider its long battery life. Just don't expect top-drawer components.

The modestly equipped Voyager's plain, boxy, silver-colored case won't turn many heads. And its convenient but limiting configuration—which includes built-in floppy and CD-ROM drives—prevents you from swapping in a DVD-ROM drive or adding a second battery. On the other hand, the Voyager features an easy-to-remove hard drive: Just press a lever and pull the drive out of the right side of the case. The battery also lifts out easily.

Some of the Voyager's other features clearly indicate that the notebook was designed for travel. The battery lasts 3 hours and 22 minutes, at least 20 minutes longer than most Pentium II-266 notebooks with 12.1-inch screens we've tested. With a case measuring 1.75 inches and a traveling weight of 7.3 pounds, the Voyager is a hair thinner and a feather lighter than a standard notebook. A built-in modem means you don't have to bother with a fragile PC Card connector.

Durability, though, doesn't seem to be one of the Voyager's strengths. The laptop's touchpad and keyboard are comfortable, but the keys felt so loose and springy

we half expected one to pop off. Using the external volume control buttons also gave us pause; we had to press so hard on the strangely designed and fragile-looking buttons located at the top of the keyboard that we feared they'd break.

Like most small vendors, Unicent provides a support package that looks skimpy next to a Dell or Gateway plan. The Voyager's manual, presented successively in four languages, covers little beyond the basics. The company limits technical support hours to 12 hours on weekdays and 7 hours on Saturday. If you don't need wall-to-wall coverage, though, the Voyager offers first-rate speed at a bargain-basement price.



Unicent Voyager 1212

## Near Misses

Eight of the notebooks we tested this month failed to make our charts. Three are highlighted below; the other five are listed in the "Beyond the Top 10" box on page 215.

THIS MONTH'S chart missers ranged from a jumbo corporate model from Compaq to a new version of a thin IBM ThinkPad. Of these, a Pentium MMX-233 from Progen came closest to earning a

spot, narrowly missing our budget chart.

Progen's \$1499 Venture M233 reminds us of a pair of sensible shoes: not flashy, but affordable and comfortable. The boxy, black, 8.3-pound notebook comes with

just about everything built in—a floppy drive, a CD-ROM drive, and a 56-kbps modem. The entire notebook, including the firm keyboard and the smooth touchpad, feels well built. At this price, you don't get a big hard drive (just 2GB), but you do

get a spacious 13.3-inch active-matrix screen. The Venture M233 has a middle-of-the-road battery life of about 3 hours and a modest PC WorldBench 98 score of 112, which is nevertheless higher than most similarly configured notebooks.

The notebook's audio features, documentation, and support plan are nothing to write home about—phone calls aren't answered on weekends—but they'll do in a notebook this cheap. If nothing on our budget chart grabs your attention, take a close look at this inexpensive option.

## FLEXIBLE FUJITSU

NO OTHER NOTEBOOK—not even one from NEC's trailblazing Versa line—offers as many mix-and-match drive and



## EXPANDABILITY

## CUSTOMER SUPPORT

CD/DVD-ROM drive speed	56-kbps modem protocol	Maximum RAM (MB)	Modular expansion bays	Bay for second battery	Optional docking station	Infrared port	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
12X-24X	not included	128	1	●	●	●	3/1	24	Sat., Sun.	BBS, WWW
8X-20X	V.90	128	0	○	●	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
2X DVD	V.90	128	0	○	○	●	1/1	13	Sat.	BBS, WWW
2X DVD	K56flex	192	1	●	○	●	3/3	24	Sat., Sun.	BBS, WWW
12X-24X	V.90	256	1	○	●	●	3 <sup>2</sup> /3	24	Sat., Sun.	BBS, CIS, WWW
12X-24X	K56flex	128	0	○	○	●	1/1	12	Sat.	BBS, WWW
8X-20X	not included	160	0	○	●	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
8X-20X	K56flex	96	0	○	○	●	1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
10X-24X	x2	96	1	●	●	●	varies <sup>3</sup> /1	24	Sat., Sun.	BBS, CIS, WWW
10X-24X	K56flex	96	0	○	○	●	3/3	11	none	BBS, CIS, WWW

<sup>3</sup> Five years on CPU and main RAM, one year on other parts.

battery options as Fujitsu's LifeBook E350. If you can afford these extras, you can configure this attractive 8.2-pound desktop replacement in dozens of ways, depending on your computing needs. Unfortunately, Fujitsu's spotty record on support and notebook reliability prevents us from recommending its portables for now.

We're also not crazy about the LifeBook's ErgoTrac—a big round button that takes the place of a touchpad—because we suspect that some users will find it hard to master. And the E350's mouse buttons are hard plastic slivers that our thumbs missed nearly every time.

On the positive side, we found the E350 easy to type on, once we got used to the slightly rounded wrist rest (which at first gave our hands the sensation of being pushed away). The LifeBook's brightness slider, one of its better features, beats the pants off standard hot-key combinations for screen adjustments. We also loved its LED status indicator. Located at the top of the keyboard, it reports on notebook activities with easy-to-see flashing letters.

The LifeBook accommodates a wide range of devices thanks to the two multi-purpose bays on its front. The left bay accepts the floppy drive; the right bay takes a DVD-ROM drive, LS-120 drive, Zip drive, or second hard drive (all sold at

extra cost). Either bay will hold the CD-ROM drive or a battery, an unusually flexible arrangement. According to Fujitsu, all the options can be hot-swapped and shared across the E series of notebooks.

We haven't tested any similarly configured notebooks, but the E350's PC World-Bench 98 score of 146 is about what we'd expect from a PII-300 equipped with Windows 95 and only 32MB of RAM.

A useful "Getting Started" foldout guide labels parts of the notebook, lists the utilities, and provides tips on how to optimize battery life. The thorough user guide includes a glossary, a big troubleshooting section, and lots of helpful illustrations.

### HORSEPOWER IN HAND

YEEE-HAW! AMS Tech's Rodéo 1010CT is a frisky little filly whose long-lived battery will let you ride the range half the day before heading back to the ranch. She's a mite homely, with a gray, boxy finish, and she's not built to take lots of extra accessories. You'll have to scrape by with less documentation and shorter support hours than those big-city companies offer, too—that's why the Rodéo doesn't make our chart. But those are the only burrs under our saddle. For a Pentium II-300 with a DVD-ROM drive and an active-matrix screen, \$2495 is pretty darn good. The

Rodéo's basic design includes fixed DVD-ROM and floppy drives, so you can't swap in other options. The Rodéo's touchpad and keyboard worked just fine, but we noticed that the keys have a loose, springy sound and feel to them, giving us a slight case of the yips about its durability. Screen resolution is limited to 800 by 600, but that's not a problem unless you have a hankerin' for every last millimeter of desktop or spreadsheet.

The Rodéo's stereo speakers, which are located near the notebook's hinges, deliver that sheriff's star sound—slightly tinny. We cottoned to AMS Tech's unique solution for adjusting audio, though. Instead of a dial, three function keys—for turning the sound up, down, and off—make controlling volume from the keyboard as easy as falling off a horse. ■

### BEYOND THE TOP 10







Other models evaluated this month (listed below) failed to score high enough to make the *Top 10 Notebook PCs* chart. For reviews, visit PC World Online ([www.pcworld.com/top400](http://www.pcworld.com/top400)).

- ◆ Compaq Prosignia 160
- ◆ Gateway Solo 5150LS
- ◆ IBM ThinkPad 560Z
- ◆ Progen Venture PII-300
- ◆ Toshiba Satellite 4015CDS



# TOP 10 HOME PCs

	POWER SYSTEM	Last month	Month tested	Street price (11/20/98)	Comments
1	 <b>Dell Dimension XPS R450</b> 800/388-8542 www.dell.com	1	Dec 98	\$2559	<b>PRO:</b> Fine performance for the second-cheapest power PC, great for demanding applications. <b>CON:</b> Limited software package.
2	 <b>Micron Millennia 450 Max</b> 888/634-8799 www.micronpc.com	2	Dec 98	\$2899	<b>PRO:</b> Fastest home PC to date, hardware extras including joystick and gamepad. <b>CON:</b> Very pricey.
3	<b>Compaq Presario 5600</b> 800/888-0220 www.compaq.com	4	Dec 98	\$2599	<b>PRO:</b> Great speed, built-in ethernet, DSL capability, FireWire. <b>CON:</b> So-so reliability and support ratings.
4	<b>Gateway G6-450</b> 800/315-2536 www.gateway.com	n/a	NEW	\$2489	<b>PRO:</b> Fast, super graphics performance, terrific sound system, great selection of software. <b>CON:</b> Mediocre reliability rating.
5	<b>Sony VAIO PCV-E308DS</b> 800/315-7669 www.sony.com/pc	5	Jan 99	\$2899	<b>PRO:</b> Supereasy set up, lots of digital imaging software, FireWire. <b>CON:</b> Tied for most expensive PC on chart, poor upgradability.
<b>BUDGET SYSTEM</b>					
1	 <b>Quantex QP6/333 M-1c</b> 800/896-4898 www.quantex.com	n/a	NEW	\$1099	<b>PRO:</b> Fast, super price even for a Celeron system. <b>CON:</b> Standard keyboard not very solid, limited software package.
2	<b>Dell Dimension V333c</b> 800/388-8542 www.dell.com	1	Dec 98	\$1499	<b>PRO:</b> Very fast and easy to use, first-class reliability rating. <b>CON:</b> Expensive for a budget system, limited range of bundled software titles.
3	<b>Gateway G6-333c</b> 800/315-2536 www.gateway.com	4	Jan 99	\$1512	<b>PRO:</b> Fast for a Celeron PC, bundled with Canon BJC-4300 color bubble-jet printer. <b>CON:</b> So-so performance with games, mediocre reliability rating.
4	<b>Compaq Presario 2266</b> 800/888-0220 www.compaq.com	5	Jan 99	\$948	<b>PRO:</b> Very cheap, decent speed for the price. <b>CON:</b> Sluggish graphics performance, skimpy software bundle.
5	<b>Micron Millennia 350</b> 888/634-8799 www.micronpc.com	3	Dec 98	\$1499	<b>PRO:</b> Fastest budget machine we've tested to date. <b>CON:</b> Fairly high price tag, modest software package.
 Best Buy    n/a = not applicable    For more about products here, select the number on the product information card or visit <a href="http://www.pcworld.com/infonet">www.pcworld.com/infonet</a> .					



WHEW! The holiday madness is finally over. We're left with pounds of poultry, dollars of debt, and (for those of us still shopping) more home PC choices than ever. In the past three months we tested 33 home systems ranging from fast, expensive muscle machines to no-frills budget systems. What did we learn from the latest holiday rush? That there's a home PC to match every need.

The PCs we tested this month illustrate our point. Of six new systems, two made the Top 10. Gateway's speedy Pentium II-450 is designed to satisfy the power hungry, while consumers on a budget will welcome an affordable Celeron-333-based system from Quantex that perfectly balances performance and price.

## POWER-PACKED PCS

GATEWAY'S NEW G6-450, number four on the power list, is a slightly reconfigured version of the G6-450 that we first tested in December. Costing \$254 less than last month, this \$2489 PC lacks the Philips CDD3610 CD-R/RW drive found on the earlier model—though that drive remains available as a \$225 option—and comes

with less expensive (but still crisp-sounding) Boston Acoustic BA635 speakers. On the other hand, Gateway beefed up other components. The company increased the size of the hard drive from 10GB to 14GB and upgraded the graphics card from an STB Velocity 128 ZX to an STB Velocity 4400, which packs 16MB of RAM. That advance, together with an updated Toshiba DVD-ROM drive, helped the G6-450 post the highest graphics scores we've seen yet.

The new Gateway machine has plenty of room for expansion, with three free PCI slots (plus one shared) and three open external drive bays. It comes with a bonanza of software as well as Gateway's own

HelpSpot, an easy-to-use program for diagnosing PC problems.

The system's top-notch performance and features were slightly offset by Gateway's middling reliability scores, which prevent the PC from earning Best Buy honors on the power chart.

Two powerful, well-built home PCs won those honors this month—Dell's Dimension XPS R450 and Micron's Millennia 450. Their close overall scores are due, in part, to some new tests that help determine a PC's graphics capability. For instance, tests of DVD-ROM drives to gauge a PC's audio and video playback quality now factor into the overall Graphics score.

Though the Dell and the Micron raced to a photo finish, there are differences between the two. The Dimension XPS R450 is slightly less expensive, but it has fewer

features. The Millennia 450 Max, on the other hand, is a gamer's dream machine that comes equipped with loads of goodies like a joystick, a game pad, and lots of cool games. For more details about both the Dell



Gateway G6-450



# SCORECARD

★ Overall rating	PC WorldBench 98 score/rating	Price	Setup/ease of use	Graphics	Reliability/support	Features	PC World InfoNet number <sup>1</sup>
85	218/outstanding	expensive	good/outstanding	outstanding	outstanding/fair	Pentium II-450, 128MB of SDRAM, 10GB hard drive, 2X DVD-ROM drive, V.90 56-kbps modem, 17-inch monitor, Turtle Beach Montego sound card.	658
85	221/outstanding	very expensive	very good/good	outstanding	good/good	Pentium II-450, 128MB of SDRAM, 14.4GB hard drive, 2X DVD-ROM drive, x2 56-kbps modem, 19-inch monitor, Iomega Zip drive, Sidewinder joystick.	659
82	216/outstanding	expensive	outstanding/good	good	fair/fair	Pentium II-450, 128MB of SDRAM, 12.9GB hard drive, 2X DVD-ROM drive, V.90 56-kbps modem, 19-inch monitor, built-in ethernet.	660
81	212/outstanding	expensive	outstanding/outstanding	outstanding	fair/good	Pentium II-450, 64MB of RAM, 14GB hard drive, 2X DVD-ROM drive, V.90 56-kbps modem, 19-inch monitor, Boston Acoustics BA635 speakers.	661
81	201/good	very expensive	outstanding/good	outstanding	good/good	Pentium II-450, 128MB of SDRAM, 10GB hard disk, 2X DVD-ROM drive, V.90 56-kbps modem, 17-inch monitor.	662
<b>Power scorecard weightings</b>	<b>Performance 20 percent</b>	<b>Price 10 percent</b>	<b>Setup/ease 15 percent</b>	<b>Graphics 15 percent</b>	<b>R &amp; S 25 percent</b>	<b>Features 15 percent</b>	
77	169/outstanding	inexpensive	good/good	good	good/good	Celeron-333, 64MB of SDRAM, 4GB hard disk, 12X-24X CD-ROM drive, K56flex 56-kbps modem, 15-inch monitor.	663
73	169/outstanding	expensive	fair/outstanding	good	outstanding/fair	Celeron-333, 64MB of SDRAM, 8.4GB hard disk, 32X-40X CD-ROM drive, x2 56-kbps modem, 17-inch monitor, Harman/Kardon HK195 speakers.	664
73	174/outstanding	expensive	outstanding/good	fair	fair/good	Celeron-333, 64MB of SDRAM, 6.4GB hard drive, 2X DVD-ROM drive, V.90 56-kbps modem, 17-inch monitor, Canon BJC-4300 printer.	665
73	130/good	very inexpensive	good/fair	poor	fair/fair	IBM 6x86MX-PR300, 64MB of SDRAM, 3GB hard drive, 12X-32X CD-ROM drive, V.90 56-kbps modem, 15-inch monitor.	666
72	178/outstanding	expensive	very good/good	good	good/good	Pentium II-350, 64MB of SDRAM, 10GB hard drive, 24X-32X CD-ROM drive, x2 56-kbps modem, 17-inch monitor.	667
<b>Budget scorecard weightings</b>	<b>Performance 15 percent</b>	<b>Price 20 percent</b>	<b>Setup/ease 15 percent</b>	<b>Graphics 5 percent</b>	<b>R &amp; S 40 percent</b>	<b>Features 5 percent</b>	<b>All products: 906</b>

and the Micron, see our December 1998 roundup "Home PCs for the Holidays" ([www.pcworld.com/dec98/homepcs](http://www.pcworld.com/dec98/homepcs)).

## LOW-COST WINNER

DEBUTING AT number one on the budget chart, Quantex's brand-new QP6/333 M-1c pushes last month's Best Buy, Dell's Dimension V333c, down a notch to second place.

At \$1099, the QP6/333 M-1c is not quite a sub-\$1000 system, but it is the first Celeron-333-based system on our chart to come close. It's a great choice for anyone who needs real speed and expandability at a good price, plus the backing of a company with good reliability and service ratings.

The 15-inch CTX VL500 monitor included at this price, however, is a little disappointing: Its text display is crisp, but colors in graphics look washed out. In addition, the keys on the keyboard feel somewhat loose and insubstantial (read: cheap). The limited software bundle does include Corel's WordPerfect Suite 8, Internet the City, and Amazon Trail II.



QP6/333 M-1c

## OFF THE CHART

THIS MONTH we also tested one of IBM's latest offerings, the Aptiva E4N. Its high price, slightly disappointing performance, and mediocre service rating kept it from making the budget chart. The E4N, powered by AMD's K6-2-350 processor, posted a PC WorldBench 98 score of 165—closer to Pentium II-333 performance. For \$1498, the E4N carries only a 15-inch monitor, one free expansion slot, and one free drive bay.

You don't get much software, either—just Lotus SmartSuite 97 and a CD with IBM's proprietary system apps. But while demanding buyers may want to pass, buyers seeking a hassle-free system will like the clear documentation and well-marked cables, which help ease setup.

Another newcomer that didn't make the budget chart is Packard Bell's Platinum 7800. At \$1278, it's priced very aggressively for a Pentium II-350 system with a 17-inch monitor. Setup is a snap, thanks to clearly written documentation and the monitor's built-in speakers; and an abun-

dance of easily accessible expansion slots and drive bays should make the task of adding new components every bit as easy. Like all Packard Bell systems, this one comes with loads of troubleshooting and maintenance utilities, such as CyberWarner, CyberCoach, and CyberTrio.

So why didn't the 7800 make the chart? Poor service ratings and performance that's well below average for a Pentium II-350 system hold it back.

Kirk Steers is a contributing editor for PC World. Testing was performed by Ulrike Diehlmann of the PC World Test Center. ■

## BEYOND THE TOP 10













We evaluated the following systems this month, too, but they didn't score high enough to make the *Top 10 Home PCs* chart list. For write-ups, see PC World Online ([www.pcworld.com/t10homepcs](http://www.pcworld.com/t10homepcs)).

- ◆ IBM Aptiva E4N
- ◆ Packard Bell Platinum 7800
- ◆ NEC Ready 9910
- ◆ NexTrend NexStar 450 PWH



## TOP 10 PRINTERS

	SMALL-BUSINESS/HOME COLOR	Street price (11/4/98)	Overall rating	Speed for plain text/full-page graphics (ppm)	Print quality for text/color graphics	Comments	PC World InfoNet number
1	 <b>Canon BJC-5000</b> 800/652-2666 www.ccsi.canon.com	\$229	83	2.3/0.4	good/ adequate	 <b>FEATURES:</b> Ink jet, rated 7.5 ppm monochrome/3 ppm color. 1440-by-720-dpi maximum resolution, 130 sheets input and output. <b>SUMMARY:</b> \$20 price drop, good text quality, and top-notch paper-handling options (it accepts sheets up to 11 by 17 inches, for example) offset below-average speeds.	688
2	 <b>Epson Stylus Photo 700</b> 800/463-7766 www.epson.com	\$249	83	1.3/0.4	adequate/ good	 <b>FEATURES:</b> Ink jet, speed unrated. 1440-by-720-dpi maximum resolution, 100 sheets input, 30 output. <b>SUMMARY:</b> \$30 price drop; good graphics print quality on plain paper—and outstanding quality on specialty media—but text speed is particularly slow. Comes with a strong photo-oriented software bundle.	—
3	<b>Canon BJC-4400</b> 800/652-2666 www.ccsi.canon.com	\$149	82	2.1/0.4	adequate/ adequate	 <b>FEATURES:</b> Ink jet, rated 6.5 ppm monochrome/2.5 ppm color. 720-by-360-dpi maximum resolution, 100 sheets input and output. <b>SUMMARY:</b> An even better buy with \$30 price drop. Good paper-handling capabilities help compensate for slow page generation and middling print quality.	689
4	<b>Epson Stylus Color 1520</b> 800/463-7766 www.epson.com	\$499	81	3.3/1.2	good/ good	 <b>FEATURES:</b> Ink jet, rated 6 ppm monochrome/5 ppm color. 1440-by-720-dpi maximum resolution, 100 sheets input, 35 output. <b>SUMMARY:</b> Whopping \$300 price drop, and it prints big—on sheets up to 13 by 19 inches. Print quality at default settings is fine; but at special settings on ink jet stock, output looks truly outstanding.	—
5	<b>Lexmark 3200 Color Jetprinter</b> 800/539-6275 www.lexmark.com	\$179	81	2.1/0.4	good/ good	 <b>FEATURES:</b> Ink jet, rated 6 ppm monochrome/2.5 ppm color. 1200-by-1200-dpi maximum resolution, 100 sheets input, 25 output. <b>SUMMARY:</b> Solid print quality for a reasonable price, but performance is somewhat slow and the design could be sturdier. The number seven 5700 Color Jetprinter offers more features.	690
6	<b>HP DeskJet 895Cse</b> 800/552-8500 www.hp.com	\$399	81	4.6/0.9	good/ good	<b>FEATURES:</b> Ink jet, rated 10 ppm monochrome/6 ppm color. Maximum resolution unrated, 100 sheets input, 50 output. <b>SUMMARY:</b> Though it costs more than we'd like, a robust design, strong paper-handling capabilities, and good print quality land it on the Top 10 for the first time. Fastest text printing on the chart and second-fastest graphics printing also help.	691
7	<b>Lexmark 5700 Color Jetprinter</b> 800/539-6275 www.lexmark.com	\$249	81	2.9/0.3	good/ good	 <b>FEATURES:</b> Ink jet, rated 8 ppm monochrome/4 ppm color. 1200-by-1200-dpi maximum resolution, 100 sheets input, 25 output. <b>SUMMARY:</b> Slightly faster on text than the Canon BJC-5000, but with less impressive print quality. Home users will especially like the bundled CD-ROM of related software.	692
<b>CORPORATE COLOR</b>							
1	 <b>Lexmark Optra SC 1275</b> 800/539-6275 www.lexmark.com	\$2149	94	7.5/0.5	good/ good	 <b>FEATURES:</b> Laser, rated 12 ppm monochrome/3 ppm color. Standard 16MB of RAM, 600-by-600-dpi maximum resolution, 400 sheets input, 250 output. <b>SUMMARY:</b> A great choice for busy offices gets better with an \$850 price drop. High printing speeds, extensive paper-handling options, and an easy-to-use design help, too.	693
2	<b>Tally T8104</b>  800/843-1347 www.tally.com	\$2429	90	9.8/0.5	good/ good	 <b>FEATURES:</b> Laser, rated 16 ppm monochrome/8 ppm color. Standard 24MB of RAM, 1200-by-600-dpi maximum resolution, 250 sheets input and output. <b>SUMMARY:</b> Fastest text speed on corporate chart, low price, and good print quality make this new model a contender, bumping the QMS Magicolor 2 CX despite the latter's superior color quality.	694
3	<b>Minolta Color PageWorks PS</b> 888/264-6658 www.minoltaprinters.com	\$3299	86	6/0.4	good/ good	<b>FEATURES:</b> Laser, rated 12 ppm monochrome/3 ppm color. Standard 20MB of RAM, 600-by-600-dpi maximum resolution, 400 sheets input, 250 output. <b>SUMMARY:</b> Impressive text quality and good paper-handling features help make up for somewhat slow speed, particularly on text. Gray-scale graphics are a bit coarse.	695
 <b>Best Buy</b>  <b>Recommended for home</b>  <b>Windows 95-certified Plug and Play</b> <b>All products: 908</b>							



**HOW WE TEST** The overall rating for both small business/home and corporate color printers is based on print quality (25 percent), price (25 percent), features (15 percent), speed (10 percent), service and support (10 percent), and ease of use (15 percent). For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



**COLOR PRINTER PRICES** are dropping like stalks of sugar cane before a machete, which means you can find great bargains for your office or home (or plantation), such as our Best Buy

Canon BJC-5000. Despite the reshuffling atop our Top 10 chart, however, price reductions on older printers prevented five pricey new models we tested this month from making the list; only one newcomer, the Tally T8104, earns a spot.



## SLASH AND BURN

DO YOU LUST after a color laser printer? You just got lucky. Prices of color laser have gone from about \$8000 to \$3500 in the past two years. Lexmark, for example, now sells its Optra SC 1275 for \$2149. Our favorite color laser back in November—when it cost \$2999—the SC 1275 still impresses us with its speed and versatility.

Ink jets are getting cheaper by the minute, too. Canon knocked \$20 off its wide-format BJC-5000, which assumes top spot on our small-business/home chart. The \$229 BJC-5000 costs less than any other ink jet we've seen that prints large-format pages (a maximum of 11 by 17 inches), and it can run two black or two color cartridges simultaneously, speeding up intensive print jobs. We also like the BJC-5000's text print quality, features, and paper handling.

Canon lopped \$30 off the price of another ink jet, the BJC-4400, which now costs \$149 and has jumped from seventh place to third. A home office bargain, the BJC-4400 handles a wide range of papers, though its print quality could be better.

Epson announced an even steeper price reduction—from \$799 to \$499—on its wide-format Stylus Color 1520. Outmaneuvering several new models with similar network connectivity, paper handling, and performance but with price tags around \$800, the 1520 rises to fourth place. (For details on these older printers, see "All Color, All the Time," December 1998,

[www.pcworld.com/dec98/printers](http://www.pcworld.com/dec98/printers).)

Meanwhile, most of the new color printers we looked at this month could use price cuts. We tested three: NEC's SuperScript 4400, Tally's T8104 (built on the same engine), and Lexmark's Optra Color 1200. We also examined three new ink jets: Epson's Stylus Color 740, Lexmark's Optra Color 45, and Xerox's DocuPrint C20. The latter two use the same software.

## NEW AND NOTEWORTHY

IF YOU NEED to print 11-by-17-inch pages and want office-level speed, paper capacity, and networkability, the expensive (\$5999) Optra Color 1200 may fill the bill you foot. The 1200 produces sharp text, but it distorted some colors on our tests. It's much faster than the new tabloid-format ink jets, churning out almost 9 text pages per minute compared to the Xerox C20's and Lexmark 45's 2.7 ppm, for example. The 1200 also supports two extra 250-sheet paper trays and an optional hard disk; you can even receive (but not send) faxes by adding a tri-port device. But move the furniture: With all its paper trays extended, this model measures about 4 feet by 2 feet.

NEC's \$3499 SuperScript 4400 fell just shy of the chart despite strong text quality and good speeds. Colors were a bit green, but still remarkably appealing. The Tally T8104 was the only new printer to make



**THE PRICEY \$399 HP DeskJet 895Cse** climbs onto the chart with a robust design, fine paper handling, and good print quality.

the chart, debuting at number two among corporate color models. It produces clean text and realistic grays and colors, though all prints look a little light. We liked the Tally's print speeds and its low price of \$2429—including ethernet connectivity.

Even as color laser prices lurch toward affordability, new networkable, high-speed ink jets shoot for small businesses. This month we tested two office-minded ink jets, Lexmark's \$899 Optra Color 45 and Xerox's \$799 DocuPrint C20. Both tabloid-format models are costly, and we weren't impressed with their speeds (both printed text at 2.7 ppm and graphics at 0.3 ppm). The two produced readable text and good, albeit somewhat gritty, gray-scale and color graphics. But the software they share needs work: users face nightmarish installation and a confusing driver.

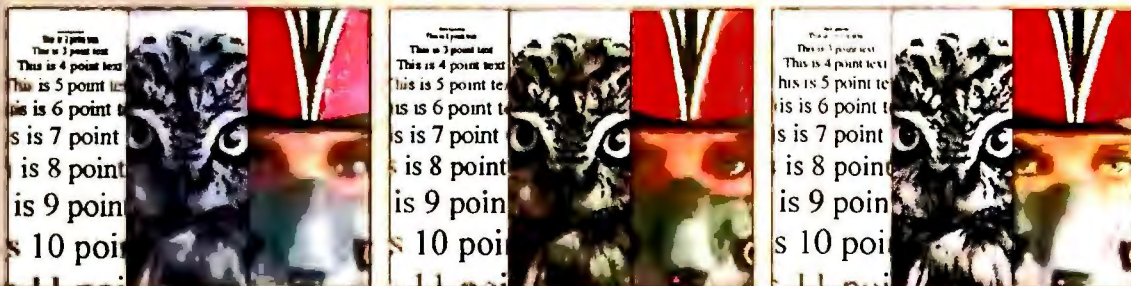
This month's only new ink jet geared toward home users—Epson's Stylus Color 740 was admirably swift for a \$279 unit: 3.3 ppm on text and 1.1 ppm on graphics. A USB port comes standard, and the software bundle includes Adobe PhotoDeluxe and Broderbund's PrintShop PressWriter. But the 740 generated merely adequate text, spotty grays, and middling color.

Absent from our charts after a long run is Hewlett-Packard's DeskJet 722C, an enduring favorite and our December Best Buy for small businesses. We'll test its successor, the DeskJet 882C, as soon as we can get our hands on one.

—Dan Littman ■

## PRINT QUALITY SAMPLES

## Realistic Grays and Color With Canon



## CANON BJC-5000

Our new Best Buy, the BJC-5000 shines with dark, even text and realistic gray-scale images. Colors are detailed, though a bit flat, and they stand out on ink jet paper.

## HP DESKJET 895CSE

New to our chart, the sixth-place 895Cse prints rich black text; bright, if grainy color; and smooth, detailed grays. Print quality on ink jet stock is excellent.

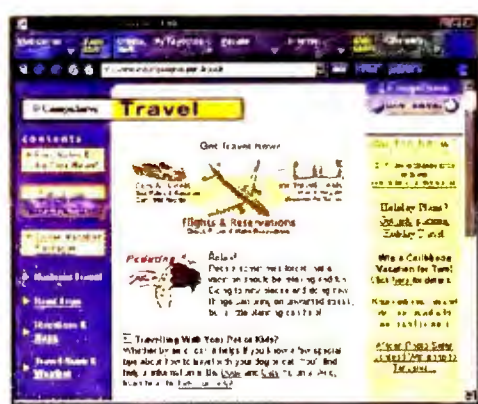
## TALLY T8104

The only new model to make our chart this month, the Tally produces crisp text, though it's a little wispy on small type. Grays and colors are light but detailed.



# See why CompuServe is the Internet online service *for the* next millennium.

Experience  
CompuServe 2000  
for 100 Hours FREE\*  
Call 1-800-848-8199 Today




Exclusive areas  
bring you more  
useful content  
than ever.

## The All-New CompuServe 2000 Is Better, Faster And Easier To Use Than Ever!

If you're looking for an online service that's easy to use, has fast, reliable Internet connections, and can bring you the Internet's most useful tools and resources, you're search is over.

Check out the all-new CompuServe 2000. You'll experience the services the world has come to trust from the Internet's original online service, *plus* new features and technological advances that will make your online experience faster, easier *and* more productive. And now you can try it all for 100 FREE\* hours by calling 1-800-848-8199.

 **CompuServe®**

Serious Information. Dependable Internet Access.







The redesigned  
toolbar makes it  
easy to navigate  
no matter where  
you are.

\* Free trial is available to new CompuServe members, age 18 or older. Trial period ends one month after initial sign-on. Offer available to U.S. and Canadian residents only. A major credit card is required. To avoid being charged a membership fee, simply cancel your membership before the trial period ends. Communication charges may apply in some areas and premium services carry surcharges, even during trial time. Members may incur charges on their telephone bill, depending on their location and calling plan, even during trial time. See online registration and terms of service for complete details. Offer expires 12/99. CompuServe is a registered trademark. © 1998 CompuServe Interactive Services, Inc.



# TOP 10 MONITORS

	19-INCH MONITOR	Month tested	Street price (11/09/98)	Overall rating	Quality of text/graphics	Comments	PC World InfoNet number
1	 Dell UltraScan P990 800/289-3355 www.dell.com	NEW	\$549	86	very good/ very good	<b>FEATURES:</b> 17.8-inch viewable area, .26mm stripe pitch Trinitron tube, up to 90-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, one-year warranty, 24-hour toll-free support. <b>SUMMARY:</b> Low price, crisp text, and vivid colors eclipse short warranty, which extends to three years if monitor is purchased with a Dell system.	601
2	Iiyama VisionMaster 450 800/394-4335 www.iiyama.com	Apr 98	\$599	85	excellent/ very good	<b>FEATURES:</b> 17.6-inch viewable area, .26mm dot pitch tube, up to 94-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, three-year warranty, 12-hour weekday toll-free support. <b>SUMMARY:</b> Bright graphics, razor-sharp text, and \$200 price cut keep it near the top, but on-screen controls lack numeric gauges for adjustment.	602
3	Sony Multiscan CDP-420GS 800/476-6972 www.sonypc.com/newdisplays	NEW	\$699	81	very good/ very good	<b>FEATURES:</b> 18-inch viewable area, .25mm stripe pitch Trinitron tube, up to 85-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, three-year warranty, 24-hour weekday toll-free support. <b>SUMMARY:</b> Expensive monitor has a finely balanced picture and an extensive array of intuitive, well-organized on-screen controls.	603
4	Princeton AGX 900 800/747-6249 www.prgr.com	NEW	\$599	80	very good/ very good	<b>FEATURES:</b> 17.7-inch viewable area, .25mm stripe pitch Trinitron tube, up to 88-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, three-year warranty, 24-hour toll-free support. <b>SUMMARY:</b> Low price, graceful design, wide array of controls; but image quality lags a bit, and submenus for controls can be hard to navigate.	604
5	ViewSonic MB90 800/888-8583 www.viewsonic.com	NEW	\$699	80	very good/ very good	<b>FEATURES:</b> 18-inch viewable area, .26mm stripe pitch Sonictron tube, up to 88-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, three-year warranty, 11-hour weekday toll-free support. <b>SUMMARY:</b> Lively colors, built-in speakers and subwoofer, and USB ports override high price and relatively short tech support hours.	605
21-INCH MONITOR							
1	 Cornerstone Imaging P1500 800/562-2552 www.bigmonitors.com	NEW	\$1245	85	very good/ excellent	<b>FEATURES:</b> 19.8-inch viewable area, .27mm dot pitch tube, up to 97-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, five-year warranty, 11.5-hour weekday toll-free support. <b>SUMMARY:</b> Excellent graphics score; crisp, dark text; and long warranty are strong points. We'd have liked longer tech support hours, though.	606
2	Iiyama VisionMaster Pro 502 800/394-4335 www.iiyama.com	NEW	\$999	84	very good/ very good	<b>FEATURES:</b> 19.4-inch viewable area, .28mm stripe pitch Diamond-tron tube, up to 102-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, three-year warranty, 12-hour weekday toll free support. <b>SUMMARY:</b> Inexpensive model features high refresh rate and color correction utilities, but control buttons aren't sensitive.	607
3	Sony Multiscan CDP-520GS 800/352-7669 www.sonypc.com/newdisplays	NEW	\$1200	84	very good/ excellent	<b>FEATURES:</b> 19.9-inch viewable area, .25mm stripe pitch Trinitron tube, up to 85-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, three-year warranty, 24-hour toll-free support. <b>SUMMARY:</b> Short depth, large viewable area, and colors that nearly equal those on the Cornerstone; no controls for focus and convergence.	608
4	Princeton Caliente C2001 800/747-6249 www.prgr.com	Apr 98	\$999	83	very good/ very good/	<b>FEATURES:</b> 19.4-inch viewable area, .28mm stripe pitch Diamond-tron tube, up to 100-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, three-year warranty, 24-hour toll-free support. <b>SUMMARY:</b> \$500 price drop. Small viewable area; displays graphics a tad better than text; on-screen control buttons seem flimsy.	609
5	IBM P202 800/843-2515 www.pc.ibm.com/us/ accessories/monitors	NEW	\$1299	82	very good/ excellent	<b>FEATURES:</b> 19.8-inch viewable area, .25mm stripe pitch Trinitron tube, up to 85-Hz refresh rate, <sup>1</sup> Plug and Play ready, <sup>2</sup> TCO'95 compliant, three-year warranty, 24-hour toll-free support. <b>SUMMARY:</b> Strong colors and sharp text can't compensate for high price. Controls were hard to navigate and required extra button pressing.	-
 Best Buy  For reviews of products that didn't make the chart, visit <a href="http://www.pcworld.com/t10monitors">www.pcworld.com/t10monitors</a> . All products: 901							



**HOW WE TEST** Ten judges rate a monitor's text and graphics quality. We evaluate each unit on how well it displays typical business letters, a newsletter, spreadsheets, Web pages, and scanned images. The overall rating is based on text and graphics quality (25 percent each), features and ease of use (25 percent), price (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.

<sup>1</sup>Highest refresh rate at 1280 by 1024 resolution. <sup>2</sup>Plug and Play monitors and graphics cards can communicate bidirectionally. However, Windows 95 does not fully utilize monitor Plug and Play.



**NEW 19-INCH MONITORS** are more affordable than ever. A few models feature the newest advance, reduced depth, which saves desktop space, as well as USB ports, fast becoming a new standard.

Among 19-inch models, Dell's new UltraScan P990 leads the way, combining terrific image quality, price, and ease of use. On the 21-inch front, meanwhile, Cornerstone Imaging's P1500 earns a Best Buy with a five-year warranty and great picture quality. ■



# PROTECT

Your Entire  
Office with  
One UPS

## Internet Office™ UPS

► COMPUTER

► MONITOR

► MODEM/FAX

► PRINTER

► SCANNER



Dedicated UPS battery backup and surge-only outlets protect your entire computer setup—even printers!

Outlet configuration accommodates bulky transformers

Available models include 500 VA and 700 VA stand-alone units, 280 VA slim-line design and 500 VA under-monitor configuration

**NEW!** Serial port and **FREE** PowerAlert® software for graceful unattended shutdown

**NEW!** 2-line modem/fax or dataline protection stops backdoor surges

**NEW!** Convenient battery replacement door

### FREE LAPTOP SURGE SUPPRESSOR

(A \$24.95 Value!)

Purchase any Internet Office UPS through participating retail and catalog outlets. Then fax your invoice to (773) 869-1351, Dept. PCW today! \* To locate a retail outlet near you, call (773) 869-1000.


\*Offer valid on invoices dated through March 31, 1999. Offer not valid with any other promotions.





**TRIPP LITE**  
POWER PROTECTION

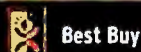


# TOP 10 GRAPHICS BOARDS

	PCI BOARD	Month tested	Street price (12/4/98)	Overall rating	Mixed-media business rating	3D rating	Features rating	Comments	PC World InfoNet number
1	 <b>STB Velocity 4400 PCI</b> 800/234-4334 www.stb.com	NEW	\$149	89	good	average	excellent	<b>FEATURES:</b> 16MB of SDRAM, 250-MHz RAMDAC, NVidia RIVA TNT chip, bundled graphics plug-ins, video editing tool, and 3D game. <b>SUMMARY:</b> STB board boasts excellent features, pleasing performance, and top-notch support policies.	648
2	<b>Matrox Millennium G200 SD PCI</b> 800/844-8305 www.matrox.com/mga	NEW	\$129	87	good	excellent	good	<b>FEATURES:</b> 8MB of SGRAM, 250-MHz RAMDAC, MGA-G200 chip, bundled 3D modeling and image editing tools and 3D game. <b>SUMMARY:</b> Affordable board performs well in graphics-heavy apps—a good upgrade for most business users and casual gamers.	649
3	<b>Diamond Monster Fusion PCI</b> 800/468-5846 www.diamondmm.com	Jan 99	\$150	86	good	excellent	average	<b>FEATURES:</b> 16MB of SDRAM, 250-MHz RAMDAC, 3Dfx Voodoo Banshee chip, bundled 3D games. <b>SUMMARY:</b> Splendid all-around performance, especially in 3D; a fine choice for gaming and standard graphics jobs. AGP version costs \$160.	650
4	<b>Metabyte Wicked3D Vengeance</b> 510/494-9700 www.wicked3d.com	NEW	\$119	85	good	excellent	average	<b>FEATURES:</b> 16MB of SGRAM, 250-MHz RAMDAC, 3Dfx Voodoo Banshee chip, bundled 3D game. <b>SUMMARY:</b> Remarkably fast 3D performance qualifies this board for hot gaming, but it's short on useful utilities like color calibration and zoom.	651
5	<b>Guillemot Maxi Gamer Phoenix</b> 877/484-5536 www.guillemot.com	Jan 99	\$110	83	good	excellent	average	<b>FEATURES:</b> 16MB of SGRAM, 250-MHz RAMDAC, 3Dfx Voodoo Banshee chip, bundled 3D games. <b>SUMMARY:</b> Although this card lacks zoom and virtual desktop utilities, it's a terrific value for users who dabble in graphics apps and play 3D games.	652

## AGP BOARD

1	 <b>Matrox Millennium G200</b> 800/844-8305 www.matrox.com/mga	Oct 98	\$129	93	excellent	excellent	excellent	<b>FEATURES:</b> 8MB of SGRAM, 250-MHz RAMDAC, MGA-G200 chip, bundled 3D modeling and image editing tools. <b>SUMMARY:</b> Faster than its PCI sibling. To view games on a TV, consider Matrox's \$129 Mystique G200 or the feature-rich \$299 Marvel G200-TV.	653
2	 <b>STB Velocity 4400</b> 800/234-4334 www.stb.com	Dec 98	\$149	93	good	excellent	excellent	<b>FEATURES:</b> 16MB of SDRAM, 250-MHz RAMDAC, NVidia RIVA TNT chip, bundled 3D games, video editing tool, and graphics plug-ins. <b>SUMMARY:</b> Costs \$50 less this month and performs well in 3D tasks, but a notch below the Matrox in mixed-media rating.	654
3	<b>Diamond Viper V550</b> 800/468-5846 www.diamondmm.com	NEW	\$169	92	excellent	excellent	good	<b>FEATURES:</b> 16MB of SDRAM, 250-MHz RAMDAC, NVidia RIVA TNT chip, bundled graphics plug-ins, 3D game, plus tools for VRML authoring, 3D visualization, and photo editing. <b>SUMMARY:</b> Generous software bundle lands Viper in third. PCI version is \$200.	655
4	<b>Creative Labs Graphics Blaster RIVA TNT</b> 800/998-5227 www.soundblaster.com	NEW	\$170	92	good	excellent	good	<b>FEATURES:</b> 16MB of SDRAM, 250-MHz RAMDAC, NVidia RIVA TNT chip, no bundled software. <b>SUMMARY:</b> This Creative Labs card performs well and comes with weekend support, making it a nice option for both business and home users.	656
5	<b>Hercules Terminator Beast</b> 800/532-0600 www.hercules.com	Dec 98	\$95	91	good	excellent	good	<b>FEATURES:</b> 8MB of SDRAM, 250-MHz RAMDAC, S3 Savage3D chip, no bundled software. <b>SUMMARY:</b> Excellent 3D performance and a low price make the Terminator Beast a good upgrade for gaming fanatics, but the company offers skimpy support.	657



For reviews of products that didn't make the chart, visit [www.pcworld.com/t10graphics](http://www.pcworld.com/t10graphics).

All products: 905



**TEST HOW WE TEST** We test boards under Windows 95. Business tests include PC WorldBench 98, a PowerPoint test, and a Macromedia Director script. Our 3D score is based on four games, each evaluated on frame rate and image quality. For AGP cards we add a texturing test using Caligari's TrueSpace3. We tested PCI boards in a Micron Millennia Mmc PC with a Pentium MMX-233 and 32MB of RAM. AGP boards were tested in an NEC Direction 333 with a PII-333 and 64MB of RAM. Overall rating is based on performance (PCI 50 percent, AGP 55 percent), features (25 percent), price (PCI 15 percent, AGP 10 percent), and support policies (10 percent). For all scores, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



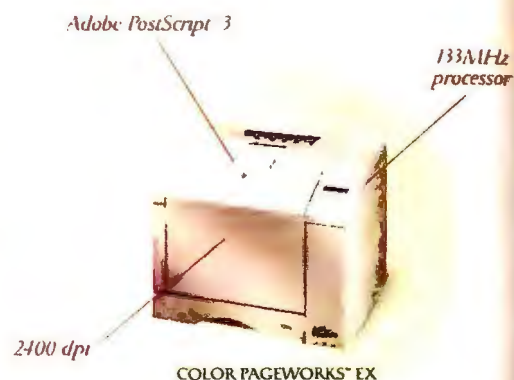
OF THE FIVE new graphics cards entering the ring this month, two are true heavyweights: STB's Velocity 4400 triumphs over Matrox's Millennium G200 SD on the PCI chart, while the AGP ver-

sion of the Matrox wins over the STB by a split decision. Among the other contenders, Metabyte's Wicked3D Vengeance PCI card lives up to its name with wickedly fast 3D performance, and new boards from Diamond and Creative Labs crack the AGP list. ■



You **WANT** PostScript® 3 color.  
You **WANT** speed.  
You **WANT** resolution.

*You just didn't know you wanted Minolta.*



Wants vs. needs. The debate has raged for centuries. The fact is, you probably *need* speed, resolution, and Adobe PostScript® 3 more than want them. And that's the point.

What you don't need is a pricey logo. Like HP's, for example. That's more of a want. And, sorry, there's no Maslow's hierarchy of wants.

The new Minolta Color PageWorks™ EX gives you all the benefits of PostScript 3 language (like faster Web printing, faster Windows® printing, and smooth handling of vector and layered images), plus Contone level 2400 dpi output and a Fiery® controller with a speedy 133MHz processor.

It's just the latest in a whole line of Color PageWorks laser printers from Minolta. The company that's coming up with more and more of the printers people want. And need.

For more information or to get a free CD-ROM, call 1-888-264-6658, or visit: [www.minoltaprinters.com](http://www.minoltaprinters.com)







 Color PageWorks PS, 5/98  Color PageWorks PS, 5/98  PageWorks 6L, 4/98  Color PageWorks, 3/98  Color PageWorks, 1/98

© 1998 Minolta Co., Ltd., Osaka, Japan. PageWorks is a trademark of Minolta Co., Ltd. HP is a trade name of Hewlett-Packard Company. All other trademarks or registered trademarks are the property of their respective companies. Information herein is subject to change without notice.

Circle 150 on card or go to [www.pcworld.com/info](http://www.pcworld.com/info)

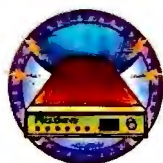


# TOP 10 MODEMS

	INTERNAL V.90 MODEM	Month tested	Street price (11/23/98)	Overall rating	56-kbps downloads / 33.6-kbps transfers (min:sec per MB)	Comments	PC World InfoNet number
1	 <b>IBM 56K Modem Internet Kit</b> 800/772-2227 www.ibm.com/pc/us/accessories	Jan 99	\$99	80	3:33/5:57	<b>FEATURES:</b> Supports x2, 16-bit ISA card, V.80 videoconferencing, USR/TI chip set, distinctive ring, voice mail, speakerphone, DSVD, Caller ID, QuickLink Message Center III software. <b>SUMMARY:</b> A great SOHO modem, the 56K has voice features, excellent 56-kbps performance, and around-the-clock support.	—
2	<b>Zoom FaxModem 56K PCI Dualmode</b> 800/631-3116 www.zoomtel.com	Jan 99	\$64	79	4:16/5:40	<b>FEATURES:</b> Supports K56flex, PCI card, Rockwell chip set, MNP-10EC error control, V.80 videoconferencing, voice mail, distinctive ring, Communicate software. <b>SUMMARY:</b> Top choice for SOHO on a strict budget. It's low-cost, has voice features, and is backed with long support hours. But it runs a little slow on 56-kbps transfers.	696
3	<b>Diamond Multimedia SupraExpress 56i</b> 800/468-5846 www.diamondmm.com	Jan 99	\$100	78	3:41/5:41	<b>FEATURES:</b> Supports K56flex, 16-bit ISA card, Rockwell chip set, V.80 videoconferencing, distinctive ring, voice mail, speakerphone, Caller ID, FaxTalk Communicator software. <b>SUMMARY:</b> Excellent candidate for home offices; performs well and has lots of features; support reps available 14 hours each weekday and on Saturdays.	697
4	<b>Amquest Host PCI 56K Dual Mode Voice/Speakerphone</b> 800/237-9988 www.amquestmodem.com	NEW	\$49	78	3:35/5:39	<b>FEATURES:</b> Supports K56flex, PCI card, MNP-10EC, V.80 videoconferencing, Rockwell chip set, voice mail, speakerphone, VoiceView, ASVO, OSVD, Caller ID, Amquest @fax.com software. <b>SUMMARY:</b> Ultra-low-cost; performs well and is packed with voice features, but it's hard to install and requires the COM2 assignment.	698
5	<b>Viking V.90 56K ISA Modem</b> 800/338-2361 www.vikingcomponents.com	NEW	\$95	77	3:23/5:41	<b>FEATURES:</b> Supports K56flex, 16-bit ISA card, Rockwell chip set, voice mail, speakerphone, QuickLink III software. <b>SUMMARY:</b> ISA modem sports great 56-kbps performance, and Viking backs it with around-the-clock support. Just as well, because the modem's skimpy manual isn't much help.	699
6	<b>Wisecom Accelerator Pro 56K Voice Fax Modem</b> 888/947-3266 www.wisecominc.com	Jan 99	\$80	77	3:48/5:39	<b>FEATURES:</b> Supports K56flex, 16-bit ISA card, Rockwell chip set, MNP-10EC, distinctive ring, voice mail, speakerphone, OSVD, ASVO, Caller ID, SuperVoice software. <b>SUMMARY:</b> Voice modem is reasonably priced, but tough-to-read manuals make it better for users who already know how to install and configure these devices.	700
7	<b>Apache Micro Peripherals NetExpress 56K</b> 800/330-1328 www.apache-micro.com	Jan 99	\$88	76	3:46/5:42	<b>FEATURES:</b> Supports K56flex, 16-bit ISA card, Rockwell chip set, distinctive ring, voice mail, speakerphone, ASVO, Caller ID, MegaConnect Lite software. <b>SUMMARY:</b> This affordable modem comes with voice features, but the company limits support to 8 hours per day, weekdays only.	701
<b>EXTERNAL V.90 MODEM</b>							
1	 <b>Diamond Multimedia SupraExpress 56e</b> 800/468-5846 www.diamondmm.com	retested this month	\$120	80	3:23/5:40	<b>FEATURES:</b> Supports K56flex, Rockwell chip set, V.80 videoconferencing, distinctive ring, voice mail, Caller ID, permanently attached serial cable, FaxTalk Communicator software. <b>SUMMARY:</b> Great all-around modem; affordable, easy to install, fastest external model here, small and portable, backed by long support hours.	702
2	<b>E-Tech CyberBullet Modem E56K RVP</b> 888/609-8885 www.e-tech.com	retested this month	\$85	79	3:23/5:41	<b>FEATURES:</b> Supports K56flex, Rockwell chip set, V.80, distinctive ring, voice mail, speakerphone, ASVO, serial cable, earphones, Cheyenne BitWare software. <b>SUMMARY:</b> Costs less than other external modems here, has voice features, performs almost as well as the SupraExpress. But we found little help in its thin manuals.	703
3	<b>Shark Multimedia Leopard XT-56K</b> 800/800-3321 www.sharkmm.com	retested this month	\$100	76	3:33/5:41	<b>FEATURES:</b> Supports K56flex, Rockwell chip set, MNP-10EC, distinctive ring, voice mail, speakerphone, VoiceView, ASVD, manual volume control, serial cable, Caller ID, DialTone software. <b>SUMMARY:</b> Low price for highly portable, loaded modem. But it can't support V.90 and K56flex at the same time.	704
 <b>Best Buy</b>			 For reviews of products that didn't make the chart, visit <a href="http://www.pcworld.com/t10modems">www.pcworld.com/t10modems</a> .				<b>All products:</b> 909



**HOW WE TEST** We test V.90 (56-kbps) and V.34 (33.6-kbps) performance over a Telecomm Analysis Systems simulated phone network. We connect each modem to two common Internet service provider modems, Ascend's Max 6000 and 3Com's Total Control. Using each ISP modem, we perform two tests. In the Network Model Coverage test, we send a .zip file over several different line conditions. For the File Type test, we send a mix of four files—graphics, text, program, and compressed files—over one line condition. We average the results for the two ISP modems to calculate NMC and FT scores, which make up, respectively, 60 and 40 percent of the total performance score. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.



WE REVISITED EXTERNAL modems using the speed tests that debuted last month (see "V.90 Modems: The End of the Line," [www.pcworld.com/jan99/modems](http://www.pcworld.com/jan99/modems)). Diamond's SupraExpress

56e still leads the pack, with great performance and features in an exceptionally small and light box. Meanwhile, IBM's 56K Modem Internet Kit remains our top internal modem—it's affordable, very fast, easy to install, and backed by 24-hour support. ■





# Self-Paced Windows Training That Gets Results

KEYSTONE LEARNING SYSTEMS CORP.

Microsoft® Certified  
Solution Provider



**Alison Balter**

Microsoft Certified  
& Access Instructor



**Paul Sheriff**

Microsoft Certified Developer  
& Visual Basic Instructor



**Dan Balter**

Microsoft MCSE  
& Windows NT Instructor

## Access 97

Beginning	\$49.95
Intermediate	\$49.95
Advanced	\$49.95
Expert	\$49.95
<b>Special-All Four</b>	<b>\$159.95</b>
MOUS Test Preparation	

## Outlook 98

Basics/Int/Adv (ea)	\$49.95
<b>Special-All Three</b>	<b>\$129.95</b>

## Word 97

Beg/Int/Adv (ea)	\$49.95
Mail Merge	\$49.95
Forms/DTP (ea)	\$49.95
Internet	\$49.95
Proficient	\$49.95
Expert	\$49.95
<b>Special-All Nine</b>	<b>\$349.95</b>
MOUS Test Preparation	

## Excel 97

Beg/Int/Adv (ea)	\$49.95
Power Features	\$49.95
Pivot Tables	\$49.95
Shortcuts & Ideas	\$49.95
Proficient	\$49.95
Expert	\$49.95
<b>Special-All Eight</b>	<b>\$299.95</b>
MOUS Test Preparation	

## Windows 95

Beg/Int/Adv (ea)	\$49.95
Plus & Special Feat.	\$49.95
Installation	\$49.95
Networking	\$49.95
<b>Special-All Six</b>	<b>\$239.95</b>

## Visual Basic 6.0

Level 1/2/3/4 (ea)	\$89.95
Level 5/6/7/8 (ea)	\$89.95
Level 9/10/11 (ea)	\$89.95
Level 12/13 (ea)	\$89.95
<b>Special-Any Six</b>	<b>\$449.95</b>
<b>Special-All Thirteen</b>	<b>\$859.95</b>

## SQL Server 6.5

Level 1/2/3 (ea)	\$89.95
Sys. Ad. Lev. 1-2(ea)	\$89.95
<b>Special-All Five</b>	<b>\$379.95</b>

## Java

Level 1/2/3 (ea)	\$89.95
Level 4/5/6 (ea)	\$89.95
<b>Special-All Six</b>	<b>\$449.95</b>

## HTML

Level 1	\$89.95
Level 2	\$89.95
Level 3	\$89.95
Level 4	\$89.95
Level 5	\$89.95
Level 6	\$89.95
<b>Special-All Six</b>	<b>\$449.95</b>

## Front Page 98

Level 1	\$89.95
Level 2	\$89.95
Level 3	\$89.95
<b>Special-All Three</b>	<b>\$249.95</b>

## QuickBooks 5.x

Beg/Int/Adv (ea)	\$49.95
Inventory & Payroll	\$49.95
Time Track & Online	\$49.95
<b>Special-All Five</b>	<b>\$199.95</b>

## Windows NT 4.0

Server Admn. Lev 1	\$89.95
Server Admn. Lev 2	\$89.95
Covers Exam 70-67	
Enterp. Admn. Lev 1	\$89.95
Enterp. Admn. Lev 2	\$89.95
Covers Exam 70-68	
Serv. & Wrk. Install	\$89.95
Covers Exam 70-63 & 70-73	
Workstn. Admn. Lev 1	\$89.95
Workstn. Admn. Lev 2	\$89.95
Workstn. Admn. Lev 3	\$89.95
Covers Exam 70-73	
Advanced Level 1	\$89.95
Advanced Level 2	\$89.95
Advanced Level 3	\$89.95
NT Resource Kit	\$89.95
Workstn. User Level 1	\$59.95
Workstn. User Level 2	\$59.95
<b>Both Videos</b>	<b>\$89.95</b>
<b>Special All Fourteen</b>	<b>\$899.95</b>

## Exchange Server 5.5

Sys. Ad. Lev 1/2/3 (ea)	\$89.95
Sys. Ad. Lev 4/5/6 (ea)	\$89.95
User	\$49.95
<b>Special-All Four</b>	<b>\$499.95</b>

## TCP/IP for NT 4.x

Level 1/2/3 (ea)	\$89.95
<b>Special-All Three</b>	<b>\$249.95</b>
Covers Exam 70-59	

## Project 98

Level 1/2/3 (ea)	\$89.95
Level 4/5 (ea)	\$89.95
<b>All Five Videos</b>	<b>\$379.95</b>

Over  
**750**  
Titles

Average: 2 hours of  
training per video



KeyStone's  
Quick Reference



## MCSE Certification

VIDEO COMBINATIONS

### MCSE Plus Internet

- 8 Windows NT, 3 Networking Ess., 3 TCP/IP, 3 IIS, 7 SQL Server, 6 Exchange Server
- 9 Transcender Exam Simulations for:  
NT-Server Cert™ 4.0 (Exam 70-67), Workstation Cert™ 4.0 (Exam 70-73)  
Enterprise Cert™ 4.0 (Exam 70-68), Net-Cert™ 2.5 (Exam 70-59), Explorer Cert™ (Exam 70-87)  
Exchange Cert™ 5.5 (Exam 70-81), TCP/IP Cert™ 4.0 (Exam 70-59)  
SQL-Admin Cert™ 6.5 (Exam 70-26), Internet Cert™ 4.0 (Exam 70-87)
- 30 videos with over 59 hours of training (Save \$799.50)

**\$2,999.95**

### MCSE Certification Plus

- 8 Windows NT, 3 Networking Ess., 3 TCP/IP, 6 Exchange Server
- 6 Transcender Exam Simulations for:  
NT-Server Cert™ 4.0 (Exam 70-67), Workstation Cert™ 4.0 (Exam 70-73)  
Enterprise Cert™ 4.0 (Exam 70-68), Net-Cert™ 2.5 (Exam 70-59)  
Exchange Cert™ 5.5 (Exam 70-81), TCP/IP Cert™ 4.0 (Exam 70-59)
- 20 videos with over 38 hours of training (Save \$445.00)

**\$1,999.95**

### MCSE Certification Pro

- 8 Windows NT, 3 Networking Ess., 3 TCP/IP, 6 Exchange Server
- 20 videos with over 38 hours of training (Save \$380.00)

**\$1,299.95**

## Office 97

VIDEO COMBINATIONS

### Microsoft Office Plus

- 3 Word, 3 Excel, 3 Access (Beg/Int/Adv)
- 3 PowerPoint, 3 Windows, 1 Outlook
- 16 videos with over 32 hours of training

**\$579.95**

### Microsoft Office Professional

- 3 Word, 3 Excel, 3 Access (Beg/Int/Adv)
- 3 PowerPoint, 1 Outlook
- 13 videos with over 26 hours of training

**\$495.95**

### Microsoft Office Standard

- 3 Word, 3 Excel, 2 PowerPoint, 1 Outlook
- 9 videos with over 18 hours of training

**\$349.95**

Ask About Tru-Media™ Multimedia Training



## 4 Easy Ways to Order:

**CALL** ▶ **1-800-976-1040**

8 0 1 - 3 7 5 - 8 6 8 0

**FAX** ▶ **1-801-373-6872**

**WEB** ▶ **www.klscorp.com/pcw**

**MAIL** ▶ **KeyStone Learning Systems Corp.**  
2241 Larsen Parkway • Provo, UT 84606

Circle 123 on card or go to **www.pcworld.com/infonet**

AD# PW29



Domestic Shipping 2-3 Days: \$5.00 for the  
first two videos; plus \$1.50 for each  
additional video tape. International Orders:  
Shipping cost will vary, call for details.

All Videos Available in PAL (European Format)  
Prices and course may vary



# Write On.



Make a full  
CD in 20  
minutes!



Twice as  
fast as the  
HP SureStore  
7200e!



Far out! Create your own CDs on the fastest parallel port cd-rewriter available. Delivers 4x write speed on virtually any Pentium\*. With one cool, inexpensive package, you can be your own author and publisher! Plus, you get unlimited rewritable storage—up to 650MB of data or 74 minutes of audio per disc. The backpack cd-rewriter accepts both CD-R and CD-RW media, so you can write once or write and rewrite. It also comes bundled with software that lets you store data, archive photographs and record music. What a great way to preserve the sounds from those



old LPs you've got lying around. (You don't still own a turntable, do you?)

In case you haven't heard, the backpack family of products includes diskette drives, hard drives and cd-rom drives. The backpack cd-rewriter, like all the rest, is compatible with notebook and desktop PCs. It also comes with smart printer-pass-through technology. You're just one cable connection away from a world of music and data. Outasight, man!



**backpack** cd-rewriter 

**MicroSolutions**  
The port•ability leader.

Ph: 800-890-7227 (US and Canada)  
or 815-756-3411, Fax: 815-756-2928  
Internet: [www.micro-solutions.com](http://www.micro-solutions.com)

\*Or Pentium equivalent.

4x model also available. Standard EPP/ECP port required.

4x model writes at 2x on slower computers.

Circle 159 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# Major breakthrough in faster system performance!



## NEW: DISKEEPER 4.0 – Defragments Paging Files for Unparalleled System Speed!

Files are commonly shattered into hundreds or even thousands of fragments. A file that has 200 fragments takes two hundred times longer to access. A file with 200,000 fragments takes 200,000 times longer and so on—slowing your system to a fraction of its potential speed. DISKEEPER for Windows NT has consistently set the standard for eliminating this primary performance bottleneck. And now, *new* DISKEEPER 4.0 provides exclusive technology that allows you to defragment the Paging File, creating the most complete, cutting-edge defragmentation solution available anywhere!

- **NEW!** Defragments the PAGING FILE at boot time.
- **EXCLUSIVE!** Consolidates and defragments Directory Files.
- **EXCLUSIVE!** Remotely schedules, monitors and controls defragmentation across the network.
- **EXCLUSIVE!** "Set It and Forget It"™ auto-scheduling options.
- Group scheduling for groups of Windows NT systems—or even entire domains with just a few clicks. (Server version)
- 100% safe and completely compatible with your existing Windows NT 4.0 system.

Stop WAITING and get performance gains you can actually see! Download a trialware copy of the new DISKEEPER 4.0.

Volume licensing and Government/Education discounts available. For best pricing call your local Reseller or call **1-800-829-6468**.

Why BUY a non-network defragmenter for Windows NT 4.0 when **DISKEEPER LITE** does a better job for **FREE!**

Download: [www.diskeeper.com](http://www.diskeeper.com)



**Executive Software**  
www.execsoft.com

701 N. Brand Boulevard, 6th Floor  
Glendale, CA 91203-1242

© 1998 Executive Software International, Inc. All Rights Reserved. DISKEEPER, EXECUTIVE SOFTWARE, the Executive Software logo and "Set It and Forget It" are trademarks owned by Executive Software. Microsoft, BackOffice, the BackOffice logo and Windows NT are trademarks of Microsoft Corporation. \*Reproduced by permission of Microsoft Press.

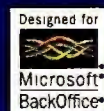
Circle 84 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

*"Disk fragmentation can cause performance problems. You should consider running a defragmentation program on a regular basis."*

— Microsoft Windows NT Server Resource Guide\*



[www.diskeeper.com/dkinfo](http://www.diskeeper.com/dkinfo)





# ☒ YES! BILL ME LATER

Rush me one year (12 monthly issues) of PC WORLD for only \$24.95. That's 65% off the annual cover price of \$71.88. Plus I'll also receive a FREE Windows 98 Tips Mouse Pad—just for trying PC WORLD.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

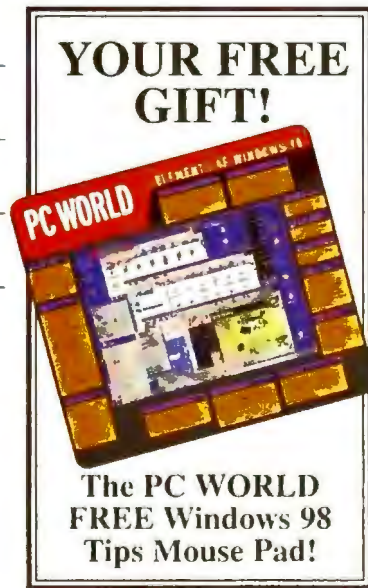
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

E-MAIL (Optional) \_\_\_\_\_

**Mail this card • Call 800-825-7595 • or Fax 303-604-7786**

Offer good in the US only. For delivery in Mexico, please add \$20 USD per subscription for postage. In Canada, please add \$20 for postage, plus 7% GST (#124669680). All other countries send \$70.95 USD to PC World, P.O. Box 55029, Boulder CO 80322-5029, USA. Savings based on annual US newsstand rate of \$71.88.

# PC WORLD





Plug into PC WORLD Online now!

<http://www.pcworld.com>



**BUSINESS REPLY MAIL**

FIRST-CLASS MAIL PERMIT NO 1262 BOULDER CO

POSTAGE WILL BE PAID BY ADDRESSEE

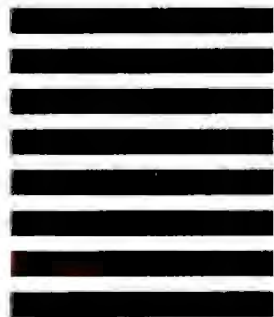
**PC WORLD**

SUBSCRIPTION DEPARTMENT

PO BOX 51833

BOULDER CO 80323-1833

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES





# Get the Best for 1999!



**Midwest Micro PRH-450  
Multimedia Pro PC with DVD**  
Pentium® II processor with 512K Cache 450 MHz  
8 Ultra ATA Hard Drive  
8-in-Wonder Pro 3D 2X AGP Graphics Card  
8 MB, TV-Tuner & Video Capture  
max 1726 Monitor (15.8" display)  
DVD-ROM Drive  
Blaster PCI 128 3D WaveTable Sound Card  
Leasing ADA-305 Speakers  
CI V.90 Modem for Windows  
Soft® Works Suite 99

**\$1999**

**1-888-447-8727**

Circle 153 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)





# MIDWEST MICRO

Quality PCs—built for less and built to order

## Solis Notebooks by Midwest Micro

### Solis Notebooks Ship with:

- Modular 3.5" Floppy Drive • Modular 24X Max CD-ROM Drive • 512K L2 Pipeline Burst Cache • NeoMagic 128-Bit Graphics • Touchpad
- USB Port & Zoom Video Connection • Stereo Speakers • Smart Lithium Ion Battery • Microsoft® Windows® 98 • 6.4 Pounds\*
- 1 Year Extendable Limited Warranty<sup>A</sup> & 7x24 Tech Support

#### ST14-2233

- Intel® Mobile Pentium® II processor 233 MHz
- 14.1" Active-Matrix TFT Display
- 32 MB SDRAM
- 2 GB Ultra ATA Hard Drive
- Microsoft Works
- JCCom 56K V.90 PC Card Modem, add \$72
- 2<sup>nd</sup> Smart Lithium Ion Battery, add \$129

#028315

**\$1899**

Business Lease \$65/mo. (36 months)

#### ST14-2266

- Intel® Mobile Pentium® II processor 266 MHz
- 14.1" Active-Matrix TFT Display
- 64 MB SDRAM
- 4 GB Ultra ATA Hard Drive
- Microsoft Office Small Business Edition
- Upgrade to a 120 MB Floppy Drive, add \$119
- Intel 10/100 Combo PC Card Adapter, add \$91

#028311

**\$2299**

Business Lease \$79/mo. (36 months)

#### ST14-2300

- Intel® Mobile Pentium® II processor 300 MHz
- 14.1" Active-Matrix TFT Display
- 64 MB SDRAM
- 6.4 GB Ultra ATA Hard Drive
- Microsoft Office Small Business Edition
- Upgrade to a DVD-ROM Drive & Decoder Card, add \$309
- U.S. Robotics 56K x2 Cellular-Capable w/XJACK Modem, add \$265

#028312

**\$2649**

Business Lease \$91/mo. (36 months)



\* System weight with floppy drive in modular bay.

## MidWest Micro Office Pro PCs

### Office Pro PCs Ship with:

- 104-Win Keyboard • 2 USB Ports • ATX7 Mini-Tower Case • Microsoft IntelliMouse™
- Microsoft Internet Explorer 4.0 • Microsoft Windows 98 • 5/3 Year Limited Warranty<sup>A</sup> & 7x24 Tech Support • 1<sup>st</sup> Year On-Site Service provided by DecisionOne<sup>B</sup>

#### PRO-333

- Intel® Pentium® II processor with 512K Cache 333 MHz
- 64 MB SDRAM
- 6.4 GB Ultra ATA Hard Drive & 3.5" Floppy Drive
- 3D AGP Graphics with 4 MB
- Clearmax 1726 Monitor (15.8" display)
- 40X Max CD-ROM Drive
- MS® Office Small Business Edition
- 100 MB Internal Zip Drive (includes one Iomega cartridge), add \$79

#025472

**\$1199**

Business Lease \$63/mo. (24 months)

#### PRO-350

- Intel® Pentium® II processor with 512K Cache 350 MHz
- Intel® 440BX Chipset
- 64 MB 100 MHz SDRAM
- 10 GB Ultra ATA Hard Drive
- SuperDisk™ 120 MB Floppy Drive (includes one LS-120 Disk)<sup>1</sup>
- 3D AGP Graphics with 8 MB
- Clearmax 1726 Monitor (15.8" display)
- 40X Max CD-ROM Drive
- MS Office Small Business Edition
- 3COM Fast EtherLink XL Network Adapter, add \$61

#025473

**\$1399**

Business Lease \$73/mo. (24 months)

#### PRO-400

- Intel® Pentium® II processor with 512K Cache 400 MHz
- Intel® 440BX Chipset
- 64 MB 100 MHz SDRAM
- 13.5 GB Ultra ATA Hard Drive & 3.5" Floppy Drive
- 100 MB Internal Zip Drive (includes one Iomega cartridge)
- ATI® XPERT 98 3D 2X AGP Graphics Card with 8 MB & TV-Out
- Clearmax 1726 Monitor (15.8" display)
- 40X Max CD-ROM Drive
- MS Office Small Business Edition
- Upgrade to a 1926 Monitor (18" display), add \$239

#025474

**\$1699**

Business Lease \$58/mo. (36 months)

#### PRO-450

- (Intel® Pentium® II processor with 512K Cache 450 MHz)

#025475

**\$1899**

Business Lease \$65/mo. (36 months)

#### PRO-450

- Intel® Pentium® II processor with 512K Cache 450 MHz
- Intel® 440BX Chipset
- 128 MB 100 MHz SDRAM
- 13.5 GB Ultra ATA Hard Drive & 3.5" Floppy Drive
- STB® Velocity 4400 TNT 3D 2X AGP Graphics Card with 16 MB
- Clearmax 1926 Monitor (18" display)
- Sony CD-R/RW Drive (4X Write/2X Rewrite/24X Read)
- Sound Blaster® PCI 128 Wavetable Sound Card
- Altec Lansing® ACS-44 Speakers with Subwoofer
- MS Office Small Business Edition
- Upgrade to a 16.8 GB Ultra ATA Hard Drive, add \$199

#025476

**\$2399**

Business Lease \$82/mo. (36 months)

**Go Configure!™**

## MidWest Micro Basics Multimedia PCs

### Basics Multimedia PCs Ship with:

- 3.5" Floppy Drive • 104-Win Keyboard • 1 USB Port
- 3 Bay Micro-Tower Case • Genius® NetScroll Mouse
- Microsoft Internet Explorer 4.0 • Microsoft Windows 98
- 1 Year Extendable Limited Warranty<sup>A</sup> & 7x24 Tech Support
- 1<sup>st</sup> Year On-Site Service provided by DecisionOne<sup>B</sup>

#### MR-300CA

- Intel® Celeron™ processor with 128K Cache 300 MHz
- 64 MB SDRAM
- 4.3 GB Ultra ATA Hard Drive
- Integrated ATI Rage Pro 3D 2X AGP Graphics with 8 MB
- Clearmax 1428 Monitor (13.2" Display)
- 40X Max CD-ROM Drive
- Integrated Yamaha® Wavetable PCI Sound
- Amplified Stereo Speakers
- 56K PCI V.90 Modem for Windows<sup>2</sup>
- Microsoft Works
- Upgrade to a 1528 Monitor (13.8" display), add \$39

**\$899**

#023160

#### MR-366C

- Intel® Celeron™ processor with 128K Cache 366 MHz
- 64 MB SDRAM
- 6.4 GB Ultra ATA Hard Drive
- Integrated ATI® Rage Pro 3D 2X AGP Graphics with 8 MB
- Clearmax 1428 Monitor (13.2" Display)
- 40X Max CD-ROM Drive
- Integrated Yamaha Wavetable PCI Sound
- Amplified Stereo Speakers
- 56K PCI V.90 Modem for Windows<sup>2</sup>
- Microsoft Works
- Upgrade to Altec Lansing ACS-44 Speakers with Subwoofer, add \$45

**\$999**

#023166



**DecisionOne On-Site Setup** Get up and running fast! Have a DecisionOne technician professionally set up your system in your home or office for only \$119. Ask your sales rep for more details.

**http://pw.mwmicro.com**



## MidWest Micro Office Pro Server

### PRS-450E

- Intel® Pentium® II processor with 512K ECC Cache 450 MHz
- SMP Compliant (Dual-Processor Ready)
- Intel® 440BX Chipset
- 128 MB 100 MHz ECC SDRAM (Expandable to 1 GB)
- 9 GB Ultra Wide SCSI-3 Hard Drive & 3.5" Floppy Drive
- Integrated Dual Channel SCSI Controller (Wide & Narrow)
- 32X SCSI Pioneer CD-ROM Drive
- Integrated Intel® EtherExpress PRO/100 PCI Adapter
- Expansion Slots: 3 PCI, 1 ISA, 1 Shared PCI/ISA
- 4 DIMM Slots
- 9-Bay Tower Chassis with 300 Watt ATX Power Supply
- 4 Cooling Fans
- Emergency Management Port (EMP)
- Integrated Cirrus PCI Graphics with 2 MB
- Clearmax 1528 Monitor (13.8" display)
- 104-Win Keyboard & MS Mouse
- Microsoft Windows NT Workstation 4.0
- LANDesk® Server Manager
- 5/3 Year Limited Warranty<sup>1</sup> & 7x24 Tech Support
- 3 Years of On-Site Service provided by DecisionOne<sup>2</sup>
- 2<sup>nd</sup> Pentium® II processor 450 MHz, add \$699
- Upgrade to MS Windows NT Server 4.0 (5 User Licenses), add \$629

#025319

**\$2699**

Business Lease \$93/mo. (36 months)

For a complete line of Servers and custom configuration options, dial 1-800-728-8590 and ask to speak to a Network Specialist.



Pictured with optional Microsoft SideWinder™ Game Pads and MS Natural Keyboard Elite™

## Go Configure!™

With MidWest Micro you've got the green light to mix and match, pick and choose, add or subtract—to create the perfect PC.

Toll Sales: **1-937-368-2309**  
Toll Fax: **1-937-368-2306**

Dealers Call: **1-800-883-1461**  
InfoFax: **1-800-445-2025**

MidWest Micro is an ISO 9001 Registered company

## MidWest Micro Multimedia Pro PCs

### Multimedia Pro PCs Ship with:

- Microsoft Works Suite 99—Word, Encarta® Encyclopedia, Works, Money Basic, Graphics Studio Greetings & Expedia™ Streets • Choice of one Lifestyle Series Software Collection • 104-Win Keyboard • 2 USB Ports • ATX7 Mini-Tower Case • Microsoft IntelliMouse • Microsoft Internet Explorer 4.0 • Microsoft Windows 98
- 5/3 Year Limited Warranty<sup>1</sup> & 7x24 Tech Support • 1<sup>st</sup> Year On-Site Service provided by DecisionOne<sup>2</sup>

### Lifestyle Series:

Entertainment- The Neverhood, Golf & Revenge of Arcade  
Reference- Virtual Globe, Bookshelf & Plus! 98 w/ Windows 98 Starts Here  
DVD Reference- Graphics Studio Home Publishing DVD, Bookshelf & Plus! 98 w/ Windows 98 Starts Here (Requires a DVD-ROM Drive)  
Gamers- Flight Simulator, CART Precision Racing & Urban Assault [add \$20 for the Gamers Series]

### PRH-333

- Intel® Pentium® II processor with 512K Cache 333 MHz
- 64 MB SDRAM
- 8.4 GB Ultra ATA Hard Drive & 3.5" Floppy Drive
- 3D AGP Graphics with 8 MB SGRAM
- Clearmax 1726 Monitor (15.8" display)
- 40X Max CD-ROM Drive
- AUREAL A3D 128 Voice Wavetable PCI Sound Card
- Altec Lansing ACS-44 Speakers with Subwoofer
- 56K PCI V.90 Modem for Windows<sup>2</sup>
- Upgrade to a SuperDisk 120 MB Floppy Drive (includes one LS-120 disk), add \$69

#025460

**\$1299**

Business Lease \$68/mo. (24 months)

### PRH-350

- Intel® Pentium® II processor with 512K Cache 350 MHz
- Intel® 440BX Chipset
- 64 MB 100 MHz SDRAM
- 10 GB Ultra ATA Hard Drive & 3.5" Floppy Drive
- 3D AGP Graphics with 8 MB
- Clearmax 1726 Monitor (15.8" display)
- 40X Max CD-ROM Drive
- Sound Blaster® PCI 128 Wavetable Sound Card
- Altec Lansing ACS-44 Speakers with Subwoofer
- 56K PCI V.90 Modem for Windows<sup>2</sup>
- Upgrade to ADA-305 USB Speakers w/ Subwoofer & Multichannel Surround Sound, add \$75

#025496

**\$1379**

Business Lease \$72/mo. (24 months)

### PRH-450

Featured on the opening!

- Intel® Pentium® II processor with 512K Cache 450 MHz
- Intel® 440BX Chipset
- 64 MB 100 MHz SDRAM
- 10 GB Ultra ATA Hard Drive & 3.5" Floppy Drive
- ATI® All-in-Wonder Pro™ 3D 2X AGP Graphics with 8 MB, TV-Tuner, Video Capture & TV-Out
- Clearmax 1726 Monitor (15.8" display)
- 4.8X DVD-ROM Drive
- DVD Software Collection
- Sound Blaster PCI 128 Wavetable Sound Card
- Altec Lansing ADA-305 USB Speakers with Subwoofer & Multichannel Surround Sound
- 56K PCI V.90 Modem for Windows<sup>2</sup>
- Upgrade to a Sound Blaster Live! Value PCI 256 Wavetable Sound Card, add \$39

#025416

**\$1999**

Business Lease \$69/mo. (36 months)

### PRH-450

- Intel® Pentium® II processor with 512K Cache 450 MHz
- Intel® 440BX Chipset
- 128 MB 100 MHz SDRAM
- 13.5 GB Ultra ATA Hard Drive
- SuperDisk™ 120 MB Floppy Drive (includes one LS-120 Disk)<sup>1</sup>
- ATI Rage 128 FURY 3D 2X AGP Graphics with 32 MB, Hardware DVD Decoder & HDTV-Out
- 3Dfx™ Voodoo2 3D Accelerator with 12 MB
- Clearmax 1926 Monitor (18" display)
- 4.8X DVD-ROM Drive
- DVD Software Collection
- Sound Blaster Live! Value PCI 256 3D Wavetable Sound Card
- Altec Lansing ADA-305 USB Speakers with Subwoofer & Multichannel Surround Sound
- 56K PCI V.90 Modem for Windows<sup>2</sup>
- Upgrade to Monsoon MM1000 Flat Panel Speakers with Subwoofer, add \$99

#025464

**\$2599**

Business Lease \$89/mo. (36 months)

### PRH-400

- (Intel® Pentium® II processor with 512K Cache 400 MHz)

#025417

**\$1799**

Business Lease \$62/mo. (36 months)

### PRH-400

- (Intel® Pentium® II processor with 512K Cache 400 MHz)

#025465

**\$2399**

Business Lease \$82/mo. (36 months)

For a complete copy of Guarantees or Limited Warranties, write MidWest Micro, Attn: Warranties, 6910 State Route 36, Fletcher, OH 45326 or visit our Web site at [www.mwmicro.com](http://www.mwmicro.com). \*Ask Sales Rep for details. On-site service provided pursuant to customer service agreement with DecisionOne. For complete terms of DecisionOne Service Agreement, write MidWest Micro, Attn: Warranties, 6910 State Route 36, Fletcher, OH 45326 or visit our Web site at [www.mwmicro.com](http://www.mwmicro.com). On-site service provided only or hardware replacement if necessary as determined by telephone-based service technician. DecisionOne is a third party service provider unaffiliated with MidWest Micro. <sup>1</sup>Also runs standard 3.5" Floppy Disks. Includes SuperDisk Tools and accelerator software. <sup>2</sup>Maximum data transfer rate may vary due to the particular modem you are communicating with, telephone lines and communication protocols.

Policy: No service charge for credit card orders. Prices are subject to change. Repair or replacement of defective products is at MidWest Micro's discretion. We are not responsible for errors in typography and photography. Original shipping and handling fees, as well as return shipping charges are non-refundable. There are no returns for credit after 30 days. All returns must be shipped in original packaging. Call or write MidWest Micro for more information on warranties and policies.

Disclaimer: Intel, the Intel Inside logo and Pentium are registered trademarks and Celeron are trademarks of Intel Corporation in the United States and other countries. Microsoft®, MS and Windows are registered trademarks of the Microsoft Corporation. All products are trademarks of their respective manufacturers. All registered and unregistered trademarks are the sole property of their respective companies. Prices do not include shipping or applicable sales tax.

GSA Schedule #GS-35F-4142D



Sales: Mon-Fri 8am-9pm  
Sat 10am-4pm EST

# 1-888-447-8727

Circle 153 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

AD# W02



# HERE'S HOW


**WINDOWS TIPS**

SCOTT DUNN

## Format Floppies on the Fly



FLOPPY DISKS ARE almost universally reviled for being too slow and too small, yet almost everyone depends on them for backing up individual files and sharing data among computers. But formatting floppies is a chore. You have to open Explorer, then navigate to the floppy drive, and choose the Format command from a menu. This is where a batch file can come in handy.

If you just want to format a disk, fire up Notepad and type **format a: /autotest** (type **b:** instead of **a:** if that's the drive you want to use). Save the file to a desired folder as something like **fmt.bat**, making sure to use the three-letter BAT extension. (I keep a separate folder just for batch files.)

But be warned: The **/autotest** switch

tells DOS to format a floppy disk without prompting you for confirmations. If you accidentally execute this batch file on a floppy containing data, use the DOS Unformat command to reverse the dire effects. Unfortunately, this rescue technique works only with Windows 3.x and DOS 6.x. If you use Windows 9x, look for

the file 'mirror.com' on your hard disk. You may have to dig out your old DOS floppies and find a file called 'mirror.co\_'. Start a DOS window (choose *Start•Programs•MS-DOS Prompt*), and at the C: prompt, type **expand a:\mirror.co\_ c:\dos\mirror.com** (your path may differ), and then press **<Enter>**. Now open the **fmt.bat** file in Notepad and add the line **c:\dos\mirror a:** above the format line in Notepad. Mirror takes some space on the floppy, but it'll let you recover data after an unintended format.

Note that this batch file won't work with NT, nor will it allow for quick formatting. To overcome these limitations, change the format line to **format a: /q <c:\windows\cr.txt** (your path may be slightly different).

If you're not using NT, you can include the mirror line as before. Save and close the file. Now right-click an empty area of the folder identified in the command line (here, it's the Windows folder) and choose *New•Text Document*. Name it **cr.txt**. Double-click the new file to open it for editing. Press **<Enter>** twice to insert two carriage returns, then type **N** followed by **<Enter>** again. This will reply to the Format command's prompts. Save the file, and exit.

If you prefer to see the normal Windows Format dialog box (Windows 9x and NT only), right-click the *Start* button and click *Open* or *Explore*. Double-click *Programs*, then navigate to the folder from which you'd like to launch the formatter. Right-click an empty area and choose *New•Shortcut*. In the Command Line box, type **rundll32.exe shell32.dll,SHFormatDrive**, taking note of the lowercase/uppercase letters as shown (see **FIGURE 1**). Click *Next* and type a name for your shortcut (like **Floppy Formatter**). Click *Finish*. If you want, you can assign a keyboard shortcut to launch this formatter: Right-click the new icon, select *Properties*, click the *Shortcut* tab, then click in the 'Shortcut key' field and type a letter or number. The system will



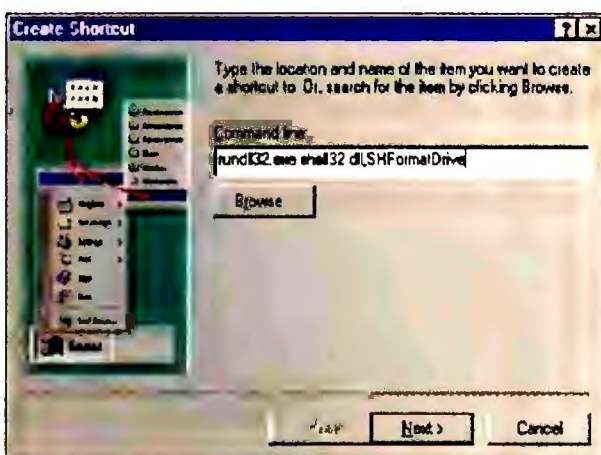


FIGURE 1: START THE WINDOWS format dialog box from a shortcut containing this command line.

automatically add 'Ctrl + Alt + ' to what you type, and that key combination will be your keyboard shortcut. Whenever you want to format a floppy, just choose your new command from the Start menu or press its keyboard shortcut.

### LOST IN DISK SPACE



FILE MANAGEMENT often requires knowing how much space your files occupy and how much disk space you have left. Here are some quick takes on making assessments:

**Files only.** Need to take stock of the number of files you have and the space they consume in a folder or drive? You'll need the status bar handy, so if it's not visible, choose *View•Status Bar* (in Explorer) or *Options•Status Bar* (in File Manager). If you're running NT or Windows 9x, make sure no files are selected to get a proper reading. To deselect all files, click an empty area of the folder (see FIGURE 2). Note that the status bar object count includes everything in the folder, including subfolders, but that the size listing does *not* count subfolders.

**Files and folders.** To get a measure of the files, folders, and subfolders occupying a drive or folder, do the following: In Win-



FIGURE 2: THE STATUS BAR shows the number and size of selected files in a folder (top) or of all files in the folder (bottom).

dows 9x and NT, select the objects, right-click on one, and choose *Properties* (or press <Alt>-<Enter>). (If you care only about how many objects are in your selection, look at the status bar.) In Windows 3.x, display a folder in File Manager, choose *File•Search*, and make sure \*.\* appears in the Search For box (or change the file spec to analyze only a certain file type). Verify that *Search All Subdirectories* is selected and click OK. Press <Ctrl>-/ to select all files in the Search Results window and choose *File•Properties*, or press <Alt>-<Enter> to see the Properties box that lists the number of files and the space they occupy.

**Free space.** Often the question isn't how much space your files take up, but rather how much room is left. Open an Explorer window (the two-pane window in Windows 9x and NT) or click the left pane of File Manager. Then, with the status bar visible, deselect all objects as explained earlier. Another option is to select a folder in the tree pane to make the status bar show, among other things, the free space available on that disk or partition.

**Graphic reminder.** If you run Windows 9x or NT, you can get a pie chart representation of free and used disk space. In My Computer, right-click the icon for the disk you want to examine, and choose *Properties*. With Windows 98 or Internet Explorer 4, make sure *As Web Page* is checked on the View menu, and select a drive (in the right pane if you're using Explorer) to see the pie chart in the preview area.

### RELOCATE WALLPAPER FILES



WALLPAPER GRAPHICS are a great way to customize your desktop. Unfortunately, Windows plunks wallpaper files into the Windows folder, amid the million other files located there. In IE 4 and Windows 98, Microsoft has added a folder just for wallpaper files (the Web\Wallpaper folder in your Windows folder). But if you already have your wallpaper files stored elsewhere, or for space reasons would prefer to keep them on another drive, you can designate a different folder for those image and HTML files. Prepare to fudge with the Windows Registry to do it, though.

Here's what to do: First, back up the fol-

- WINDOWS TIPS**
- 232 Discover Windows 98's hidden treasures, speed up your boot-up time.

- WINDOWS NT**
- 236 Install Windows 9x and NT on different partitions on the same hard disk.

- ANSWER LINE**
- 246 How much electricity are you wasting? And what can you do about it?

- INTERNET TIPS**
- 248 You can do more with your browser than just look at the Web. We show you how.

- WORD PROCESSING**
- 252 Pick a different template as your default, clean up the Letter Wizard.

- SPREADSHEETS**
- 254 Selectively display data with Excel's Autofilter, create rankings in lists.

- HARDWARE TIPS**
- 262 Reset your CMOS password, understand and prevent hard disk errors.

- UPGRADE GUIDE**
- 264 A step-by-step tutorial for upgrading your Windows system to NT 4.0.



DON'T MISS ADDITIONAL HERE'S HOW information at [www.pcworld.com/heres\\_how](http://www.pcworld.com/heres_how).

lowing files in your Windows folder: user.dat, system.dat, user.dao, and system.dao. Next, choose *Start•Run*, type *regedit*, and press <Enter> to launch the Registry Editor. Travel down the folder tree in the left pane until you come to 'HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion'. With the CurrentVersion folder selected in the left pane, look in the right pane for an icon labeled 'WallPaperDir'. Double-click it and edit the path in the 'Value data' box to reflect your preferred wallpaper folder. Then click OK and exit the Registry Editor.

To see the effect, just right-click the desktop and choose *Properties*. With ►



the Background tab in front, the list of wallpapers you see should include all wallpaper-compatible files (.bmp, .gif, .jpg, and .html) in the Windows folder and in the folder you designated. And if you click

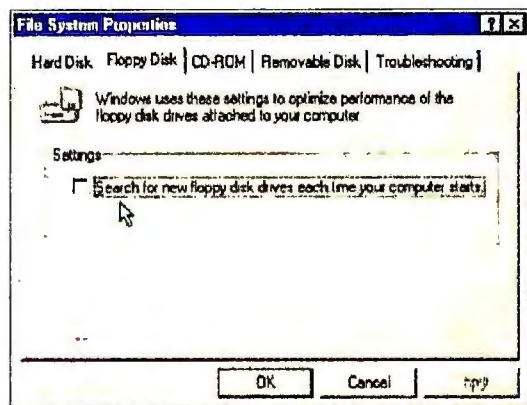


FIGURE 3: WINDOWS MAY start a wee faster if it doesn't update floppy info each time.

Browse, you'll see the contents of the folder containing the currently selected file in the list. Happy decorating.

## SKIP THE FLOPPY BOOT CHECK

**98** AT BOOT-UP, Windows 98 checks to see if a floppy drive is present, which adds a few seconds to the process. You can start your system a bit faster by bypassing this drive check.

Right-click My Computer and choose Properties. Click the Performance tab and then click File System. In the File System



FIGURE 4: ADD FREQUENTLY USED text to the Clipboard instantly with ClipTray.

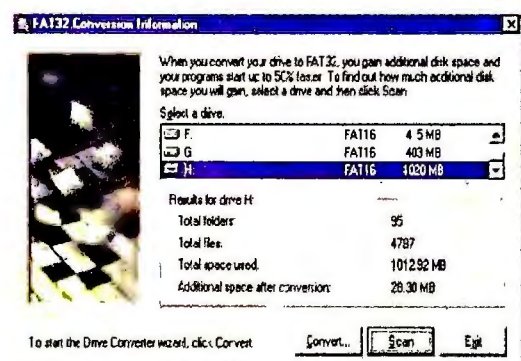


FIGURE 5: SEE HOW MUCH space you can gain on your hard disk with FAT32.

Properties dialog box, click the Floppy Disk tab. Then uncheck Search for new floppy disk drives each time your computer starts (see FIGURE 3). You may need to press <F5> in My Computer to refresh the floppy drive listing after each boot.

## HIDDEN TREASURES

**98** NOT ALL of the new utilities in Win 98 are available on the Start menus. But if you have the Windows 98 upgrade CD, you can install the Windows 98 Resource Kit Sampler, which includes the following little programs of varying usefulness:

**ClipTray** lets you place frequently used text into the Windows Clipboard, so you can paste it into documents—great for entering boilerplate copy. To select a saved text element, just right-click the ClipTray icon in the Windows 9x taskbar tray (see FIGURE 4). Put ClipTray in your StartUp folder to keep it running every day.

**Fat32 Conversion Information** estimates how much disk space you'll gain by converting your drive to FAT32 (see FIGURE 5).

**Link Check Wizard** analyzes all your Windows shortcuts and determines which ones no longer point to existing files or applications. Select the ones you want to remove, click Finish, and your system is suddenly a little tidier. This tool is a handy little housecleaner, particularly if program uninstalls leave a boneyard of dead shortcuts in your Start button's Program area.

**Microsoft File Information** may not answer every question you have about your Windows installation, but if you can cope with the geekspeak, it can show you which .cab archive houses which files.

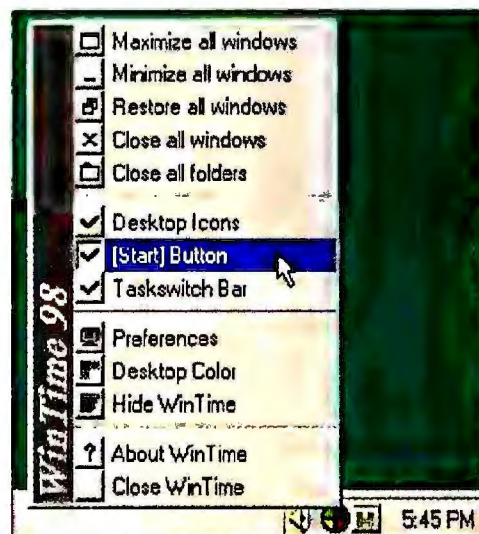
**QuickTray** lets you add application or file icons to the system tray for one-click launching of your key files or applications.

**TextViewer** is just what its name implies—a basic way to view the contents of

## WINDOWS TOOLBOX

### Good Things in a Small Package

WINTIME IS YET ANOTHER utility yearning to occupy space in your taskbar's tray area. Its many functions let




you hide windows or make them stay on top, hide buttons on the taskbar, hide the Start button, and even hide its own tray icon (a great way to discourage tampering on demo or classroom PCs). Other options allow you to start the screen saver from a customizable "hot corner," or schedule task reminders. You can display a menu for digging up

buried windows, and for minimizing, maximizing, restoring, or closing applications. Download it for free from PC World Online's FileWorld ([www.fileworld.com/magazine](http://www.fileworld.com/magazine)).

.htm, .txt, .ini, .inf, .bat, or other text-only files (.html files appear as HTML code, not as they would in a browser). Unfortunately, it suffers from the same file-size limitations as Notepad.

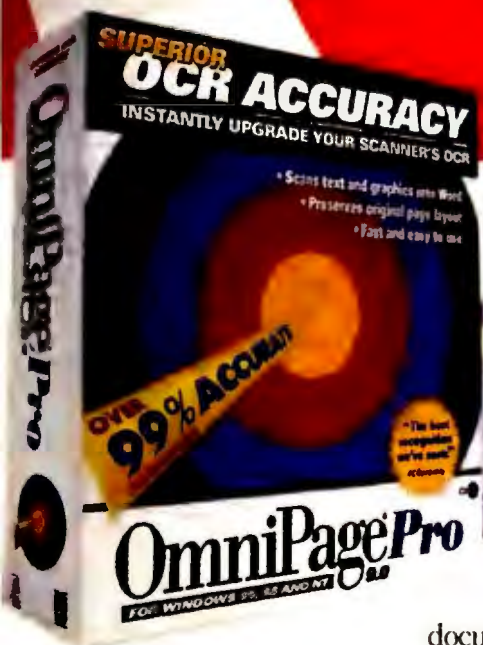
**Tweak UI** is the indispensable Control Panel icon for customizing the Windows interface, the same one you get if you download the free Microsoft PowerToys from FileWorld ([www.fileworld.com/magazine](http://www.fileworld.com/magazine)). Tweak UI lets you hide desktop icons or erase telltale history lists, prevents "Shortcut to" from being added to all your shortcut names, and replaces tiny icons with large ones (to relieve eyestrain).

**WinDiff** has an awkward interface, but it's a handy tool for comparing two text files or two directories, highlighting the differences in color. It's great for puzzling through multiple .ini file updates or dueling config.sys files. WinDiff even compares Explorer file listings.

 Find more tips on PC World Online at [www.pcworld.com/heres\\_how](http://www.pcworld.com/heres_how), and files from this article at [www.fileworld.com/magazine](http://www.fileworld.com/magazine). Windows Tips pay \$50 for published questions and tips. Scott Dunn is a contributing editor for PC World and a principal author of The PC Bible, 2nd Edition (Peachpit Press, 1995). See page 14 for contact information. ■



# INTRODUCING THE FASTEST, MOST ACCURATE OCR EVER.



## New OmniPage Pro 9.0: Over 99% accurate—guaranteed.

Others may talk a good game. But only OmniPage Pro is the most accurate, best-selling brand of OCR. Why? Guaranteed OCR accuracy—uncanny precision that recognizes poor-quality faxes and copies, small text and crooked pages. The ability to preserve document, table and even spreadsheet formats. And, the ability to scan text directly into Microsoft Word and other applications.

OmniPage Pro 9.0 is the world's most accurate OCR made even more accurate. If you're not using it, you're taking chances. Call us now to order, or visit your local reseller.

- Maintains original page layouts
- Seamless integration with Microsoft Word
- Easy, one-button AutoOCR Toolbar™
- Now preserves graphics in color
- Recognizes tables and spreadsheets
- Now includes PageKeeper Standard. Easily file and find scanned images!

**ALL FOR ONLY \$99\*\***

**800-736-5735, x. 60**

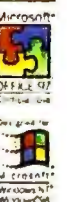
Supports Windows 95, 98 and NT.

**"The best  
recognition  
we've seen."**

PC Computing



www.caere.com



\*Using standard fonts on laser-quality documents. \*\*Suggested price U.S. dollars—subject to change without notice. Offer valid in U.S. and Canada only. Caere, the Caere logo, OmniPage and PageKeeper are registered trademarks and AutoOCR Toolbar is a trademark of Caere Corporation. All other names are the property of their respective holders. © 1998

Circle 91 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# How to Run Both NT and Windows 95/98

SWITCHING OPERATING systems is a gut-wrenching decision. Even if the upgrade works, you face a steep learning curve and a litany of hardware and software hassles: NT may spell curtains for games and utilities, and will inactivate nifty Universal Serial Bus devices. The solution: Keep Windows 9x as you move to NT, and choose which OS to run at start-up.

## HAPPY TOGETHER

YOU CAN RUN NT alongside Win 9x or even Win 3.x by pointing to a directory other than the existing Windows directory when you install NT. But first decide how you will manage data and applications on your dual-boot system, since each OS works with disk drives in its own way. If you want NT and Win 9x or 3.x to have free access to all files and partitions, you must sacrifice some features. NT's own File System (NTFS) offers password-protected file access and on-the-fly file- and folder-level compression (for selectively saving disk space). Win 98 and OSR2 versions of Win 95 feature the FAT32 file system, which includes efficient file storage and the ability to defragment as needed. Unfortunately, NT won't recognize FAT32 disk partitions, and Win 9x can't make sense of NTFS. (All versions of Win 9x and NT support FAT16, the file system found in the original Win 95 and 3.x.)

So what should you do? You can install NT onto the same disk and partition as

Win 9x, but the partition must be formatted in FAT16. Because FAT16 can only handle partitions that are 2GB or

smaller, large hard disks will be split into three or more partitions (which get separate drive letters). Install NT and Win 9x to different partitions, and you can adopt an optimized file system for each OS and use larger partitions.

Dual-booters must also contend with program installation. When you add Windows NT to your PC, you must reinstall all your applications—the NT Registry won't take configuration data from the Windows 9x Registry. To avoid keeping duplicate program files on your hard disk, when you reinstall those apps, direct the setup programs to write files to the application directory that already exists for Win 9x. Remember, format your Win 9x partition using FAT16; otherwise you won't see the existing program directories from NT. See **FIGURE 1** for more on this.

## TAILOR YOUR DUAL-BOOT START-UP

IN A DUAL-BOOT setup, your system will boot by default into Win 9x. But before it does, a 30-second delay gives you time to select another OS from a list of installed operating systems. If you want, you can



## Assess NT's Performance

WINDOWS NT Performance Monitor provides detailed performance data, but a quicker way to obtain that information is from the Windows NT Task Manager. Right-click the taskbar, select *Task Manager*, and click the *Performance* tab. You will see real-time graphs and data on CPU and memory usage. To track CPU activity without hogging screen space, click *Options•Hide When Minimized*, and minimize the Task Manager window. A small icon in the taskbar tray will now graph CPU usage.

speed up the 30-second delay from the NT System Properties box:

1. Click *Start•Settings•Control Panel*.
2. Open the *Systems* icon.
3. In the System Properties dialog box, click the *Startup/Shutdown* tab.
4. From the Startup drop-down list, select the operating system to which you wish to boot by default.
5. In the 'Show list for' field, enter the time in seconds you want the OS list to appear before the default OS loads. Then click OK.

To force the system to wait until you pick an OS, modify the file *boot.ini* in the root directory of your NT partition. Open the file using Notepad or another text editor, and find the line that starts with 'Timeout='. Change the numeric value in this line to -1, which NT interprets as an indefinite amount of time. Note: The 'Show list for' item in the Startup/Shutdown sheet rejects negative values. You must enter it directly into *boot.ini*.

Windows NT pays \$50 for published questions and tips. Michael Desmond is a freelance writer and consultant. See page 14 for contact information.

## MICROSOFT'S FILE SYSTEMS: HOW TO TELL THEM APART

NT uses...	Win 9x uses...	Result	Scenario
FAT16	FAT16	Best compatibility, worst file system efficiency, poor security.	Best for users switching freely between NT and 9x. From either OS you can access all partitions and files, and a single installation base can be used to run applications.
NTFS	FAT16	Good compatibility and security, preserves NT file security and compression features.	Best for NT-centric users. From NT you can access all partitions and files, and applications can run under both NT and 9x from a single FAT16 installation base. From Windows 9x you will not be able to see the NTFS partition.
FAT16	FAT32	Poor application compatibility, poor NT security, no NT file features.	Best for Windows 9x-centric users. Under Win 9x you can access all partitions and files, but under NT you won't see the Windows 9x partition. What's more, NT sessions will lack useful NTFS file features.
NTFS	FAT32	Worst compatibility, best security, optimal file system features for each OS.	Best for a shared home-office PC. Any program you run under both NT and 9x must be installed separately in each partition. That prevents an application uninstall (or corruption) in Win 9x from affecting your NT-based partition.

FIGURE 1: ONE USER'S IDEAL FILE SYSTEM may not meet the needs of another—the reason why Microsoft offers three partition types.



**YOUR BUSINESS IS BEING FORCED TO COMPETE WITH  
LESS MONEY  
LESS PEOPLE  
AND  
LESS TIME.**

**NOW WHAT?**

BE DIRECT™  
**DELL®**  
 [www.dell.com](http://www.dell.com)



MAKE THE MOST OF

# YOUR

Pay for exactly what you want without buying anything you don't need. It's easy when you custom configure your system with Dell. Choose from any of the feature-rich models shown here. Or pick a base model and have us customize it just for you. Like our Dell® Dimension® XPS R450. Featured here with a 19-inch (18.0" viewable) Trinitron monitor, a high-speed 16MB graphics card, a full 128MB of memory and a high-performance 7200 rpm 14.4GB hard drive to store your critical business applications and data. Of course, you can have it any way you want at [www.dell.com](http://www.dell.com), or just call us today.



*The Dell Dimension XPS R-series. Feature-rich systems to satisfy power-hungry computer users.*



*The Dell Dimension V-series. Value-packed desktops that deliver outstanding performance for your dollar.*





# MONEY.

## DELL® DIMENSION® XPS R450 PENTIUM® II PROCESSOR AT 450MHz

- 256MB 100MHz SDRAM
- 512KB Integrated L2 Cache
- NEW 17.2GB Ultra ATA Hard Drive
- NEW 15" (15.0" viewable) Flat Panel 1500FP Display
- 16MB STB nVidia TNT 3D AGP Graphics Card
- 4.8X DVD-ROM Drive and Decoder Card
- Turtle Beach Montego A3D 64V Sound Card
- ACS-295 Speakers with Subwoofer
- 3Com® USRobotics V.90<sup>™</sup> PCI Telephony WinModem
- Trial Offer ConnectDirect<sup>SM</sup> Internet Access
- Iomega Zip 100MB Internal Drive
- APC SurgeStation Pro8T2
- MS® IntelliMouse®

**\$3379**

Business Lease<sup>®</sup>: \$128/Mo., 36 Mos.

 **E-VALUE CODE: 03595-590133**

## DELL DIMENSION XPS R450 PENTIUM II PROCESSOR AT 450MHz

- 128MB 100MHz SDRAM
- 512KB Integrated L2 Cache
- 14.4GB Ultra ATA Hard Drive (7200 rpm)
- NEW 19" (18.0" viewable, .26dp) Trinitron® P990 Monitor
- 16MB STB nVidia TNT 3D AGP Graphics Card
- 4.8X DVD-ROM Drive and Decoder Card
- Turtle Beach Montego A3D 64V Sound Card
- ACS-295 Speakers with Subwoofer
- 3Com 3C905B 10/100 NIC
- MS IntelliMouse
- ★ Upgrade to a NEW 15" (15.0" viewable) Flat Panel 1500FP Display, add \$365.

**\$2599**

Business Lease<sup>®</sup>: \$98/Mo., 36 Mos.

 **E-VALUE CODE: 03595-590125a**

## DELL DIMENSION XPS R450 PENTIUM II PROCESSOR AT 450MHz

- 128MB 100MHz SDRAM
- 512KB Integrated L2 Cache
- NEW 12.9GB Ultra ATA Hard Drive
- NEW 19" (18.0" viewable, .26dp) Trinitron P990 Monitor
- 8MB STB nVidia 3D AGP Graphics Card
- 40X Max<sup>™</sup> Variable CD-ROM Drive
- Crystal 3D 64V Wavetable Sound
- harman/kardon HK-195 Speakers
- 3Com 3C905B 10/100 NIC
- APC SurgeStation Pro8T2
- MS IntelliMouse
- ★ Upgrade to a NEW 17.2GB Ultra ATA Hard Drive, add \$119.
- ★ Upgrade to a 16MB STB nVidia TNT 3D AGP Graphics Card, add \$35.

**\$2279**

Business Lease<sup>®</sup>: \$86/Mo., 36 Mos.

 **E-VALUE CODE: 03595-590122**

## DELL DIMENSION XPS R400 PENTIUM II PROCESSOR AT 400MHz

- 96MB 100MHz SDRAM
- 512KB Integrated L2 Cache
- NEW 12.9GB Ultra ATA Hard Drive
- 19" (17.9" viewable, .26dp) 1200HS Monitor
- 16MB STB nVidia TNT 3D AGP Graphics Card
- 40X Max<sup>™</sup> Variable CD-ROM Drive
- Crystal 3D 64V Wavetable Sound
- harman/kardon HK-195 Speakers
- APC SurgeStation Pro8T2
- MS IntelliMouse
- ★ Upgrade to 128MB 100MHz SDRAM, add \$69.
- ★ Iomega Zip 100MB Internal Drive with Two Cartridges, add \$99.
- ★ 3Com 3C905B 10/100 NIC, add \$50.

**\$1999**

Business Lease<sup>®</sup>: \$76/Mo., 36 Mos.

 **E-VALUE CODE: 03595-590119a**

## DELL DIMENSION V350 PENTIUM II PROCESSOR AT 350MHz

- 96MB 100MHz SDRAM
- 512KB Integrated L2 Cache
- NEW 12.9GB Ultra ATA Hard Drive
- 17" (16.0" viewable, .26dp) Trinitron 1000HS Monitor
- 8MB ATI 3D AGP Graphics
- 32X Max<sup>^</sup> Variable CD-ROM Drive
- Yamaha XG 64V Wavetable Sound
- harman/kardon HK-195 Speakers
- Iomega Zip 100MB Internal Drive
- Logitech First Mouse+ Wheel (PS/2v)
- ★ Upgrade to a 19" (17.9" viewable, .26dp) 1200HS Monitor, add \$99.

**\$1749**

Business Lease<sup>®</sup>: \$66/Mo., 36 Mos.

 **E-VALUE CODE: 03595-590117a**

## DELL DIMENSION V333c INTEL® CELERON™ PROCESSOR AT 333MHz

- Network-Designed Desktop**
- 64MB SDRAM
  - 128KB Integrated L2 Cache
  - 8.4GB Ultra ATA Hard Drive
  - 17" (15.9" viewable) 1000LS Monitor
  - 8MB ATI 3D AGP Graphics
  - 32X Max<sup>^</sup> Variable CD-ROM Drive
  - Turtle Beach Montego A3D 64V Sound Card
  - harman/kardon HK-195 Speakers
  - Integrated Intel 10/100 Ethernet Controller
  - Logitech First Mouse+ Wheel (PS/2v)

**\$1379**

Business Lease<sup>®</sup>: \$52/Mo., 36 Mos.

 **E-VALUE CODE: 03595-590113**

## POWER UPGRADES

- Iomega Zip 100MB Internal Drive with Two Cartridges, add \$99.
  - 3Com USRobotics V.90<sup>™</sup> PCI Telephony WinModem, add \$49.
  - 3Com 3C905B 10/100 NIC, add \$50.
  - Intuit QuickBooks v6.0 Pre-installed, add \$118.
  - 3-Year Next-Business-Day On-site<sup>^</sup> Service, add \$99.
- Prices valid with system purchase only.

**\$50 MAIL-IN REBATE ON THESE HP PRODUCTS WHEN PURCHASED WITH A DELL DESKTOP AND MONITOR. OFFER ENDS 1/30/99!**

- Add an HP DeskJet® 722C Color Printer for only

**\$249**

**\$299 – \$50 MAIL-IN REBATE<sup>†</sup>**

- Add an HP OfficeJet 600 Multifunction Printer for only

**\$349**

**\$399 – \$50 MAIL-IN REBATE<sup>†</sup>**

- Add an HP ScanJet 4100Cse for only

**\$149**

**\$199 – \$50 MAIL-IN REBATE<sup>†</sup>**

## DELL DIMENSION AWARD INFO

- Since 1990, PC Computing has given Dell Dimension systems more MVP awards than any other desktop line in the category.
- Winner of the 1998 PC Computing MVP "State-of-the-Art Desktop" (XPS R450) and "High-Performance PC" award (XPS R400).
- Three-time "A" rating in PC Magazine's Readers' Choice Awards for Service and Reliability (1996-1998).
- Received the highest "Buy Again" ratings from Windows Magazine's 1998 Tech Support Survey.

Advertised configurations vary from award-winning configurations.



**USE THE POWER OF THE E-VALUE™ CODE.**

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E-VALUE CODE ONLINE AT [WWW.DELL.COM/EVALUE](http://WWW.DELL.COM/EVALUE), OR GIVE IT TO YOUR SALES REP OVER THE PHONE

**TO ORDER TOLL-FREE**

**888-395-3437**

**BUILD YOUR OWN AND ORDER ONLINE**

## COMMON FEATURES FOR ALL SYSTEMS SHOWN


### Featured Systems Include:

- Microsoft® Office 97 Small Business Edition v2.0 plus Bookshelf 98 (Call about Our FREE MS Office 2000 Upgrade Offer)

- McAfee VirusScan
- Microsoft Windows® 98
- Dell QuietKey® Keyboard
- 3-Year Limited Warranty<sup>†</sup>
- 1-Year On-site<sup>^</sup> Service

**BE DIRECT™**

**DELL®**

 [www.dell.com](http://www.dell.com)



MAKE THE MOST OF

# YOUR



Time is money, as the saying goes, so make the most of yours. With a Dell<sup>®</sup> Inspiron<sup>®</sup> notebook. Powered by the Intel<sup>®</sup> Pentium<sup>®</sup> II mobile processor, Dell notebooks can make road time, productivity time. From value-packed systems to power systems capable of carrying and running some of your most demanding applications, there's a Dell notebook that's right for you. Take our fully loaded Inspiron 7000: Its massive 15-inch screen, high-end video and DVD drive deliver blockbuster presentations. And it's just one of the many fully loaded choices waiting for you today at [www.dell.com](http://www.dell.com).



*The Dell Inspiron 7000 Notebook Series. All-in-one multimedia performance.*



*The Dell Inspiron 3500 Notebook Series. Light weight. Light price.*



*The Dell Latitude<sup>®</sup> Notebook Series. The network-optimized notebook.*



pentium II



# TIME.

## DELL INSPIRON™ 7000 D300LT PENTIUM II PROCESSOR AT 300MHz FEATURING MMX™ TECHNOLOGY

### All-in-One Multimedia Performance

- 15" XGA Active Matrix Display
- 96MB SDRAM (384MB Max\*)
- 4GB Ultra ATA Hard Drive
- Removable Combo 2X DVD-ROM and Floppy Drive
- 2X AGP 8MB ATI RAGE Pro 3D Video
- 3D Surround Sound and Hardware Wavetable
- 12-Cell Intelligent Lithium Ion Battery
- Internal 56K Capable™ V.90 Fax Modem
- Trial Offer ConnectDirect™ Internet Access
- MS® Office 97 SBE (Call about Our FREE MS Office 2000 Upgrade Offer)
- Microsoft® Windows® 98/Touchpad
- 3-Year Limited Warranty†

# \$3199

Business Lease\*: \$121/Mo., 36 Mos.

 **E-VALUE CODE: 03596-890131**

## DELL INSPIRON 7000 D300LT PENTIUM II PROCESSOR AT 300MHz FEATURING MMX TECHNOLOGY

### All-in-One Multimedia Performance

- 15" XGA Active Matrix Display
- 64MB SDRAM (384MB Max\*)
- 4GB Ultra ATA Hard Drive
- Removable Combo 24X Max^^ Variable CD-ROM and Floppy Drive
- 2X AGP 8MB ATI RAGE Pro 3D Video
- 3D Surround Sound and Hardware Wavetable
- 12-Cell Intelligent Lithium Ion Battery
- Internal 56K Capable™ V.90 Fax Modem
- Trial Offer ConnectDirect™ Internet Access
- MS Office 97 SBE (Call about Our FREE MS Office 2000 Upgrade Offer)
- Microsoft Windows 98/Touchpad
- 3-Year Limited Warranty†

# \$2899

Business Lease\*: \$110/Mo., 36 Mos.

 **E-VALUE CODE: 03596-890128**

## DELL INSPIRON 7000 D300GT PENTIUM II PROCESSOR AT 300MHz FEATURING MMX TECHNOLOGY

### All-in-One Multimedia Performance

- 14.1" XGA Active Matrix Display
- 32MB SDRAM (384MB Max\*)
- 4GB Ultra ATA Hard Drive
- Removable Combo 24X Max^^ Variable CD-ROM and Floppy Drive
- 2X AGP 4MB ATI RAGE Pro 3D Video
- 3D Surround Sound and Hardware Wavetable
- 12-Cell Intelligent Lithium Ion Battery
- Deluxe Nylon Case
- MS Office 97 SBE (Call about Our FREE MS Office 2000 Upgrade Offer)
- Microsoft Windows 98/Touchpad
- 3-Year Limited Warranty†
- ★ Upgrade to 64MB SDRAM, add \$99.

# \$2699

Business Lease\*: \$102/Mo., 36 Mos.

 **E-VALUE CODE: 03596-890126**

## DELL INSPIRON 3500 D266GT PENTIUM II PROCESSOR AT 266MHz FEATURING MMX TECHNOLOGY

### Light Weight, Light Price

- 14.1" XGA Active Matrix Display
- 32MB SDRAM (256MB Max)
- 4.3GB Ultra ATA Hard Drive
- Modular 24X Max^^ Variable CD-ROM
- Modular Floppy Drive
- NeoMagic MediaMagic 256AV AGP Video
- 3D Surround Sound and Software Wavetable
- 9-Cell Intelligent Lithium Ion Battery
- APC SurgeArrest Notebook Pro
- MS Office 97 SBE (Call about Our FREE MS Office 2000 Upgrade Offer)
- Microsoft Windows 98/Touchpad
- 3-Year Limited Warranty†

# \$2379

Business Lease\*: \$90/Mo., 36 Mos.

 **E-VALUE CODE: 03596-890123a**

## DELL INSPIRON 3500 D233XT PENTIUM II PROCESSOR AT 233MHz FEATURING MMX TECHNOLOGY

### Light Weight, Light Price

- 13.3" XGA Active Matrix Display
- 32MB SDRAM (256MB Max)
- 3.2GB Ultra ATA Hard Drive
- Modular 24X Max^^ Variable CD-ROM
- Modular Floppy Drive
- NeoMagic MediaMagic 256AV AGP Video
- 3D Surround Sound and Software Wavetable
- 9-Cell Intelligent Lithium Ion Battery
- MS Office 97 SBE (Call about Our FREE MS Office 2000 Upgrade Offer)
- Microsoft Windows 98/Touchpad
- 3-Year Limited Warranty†

# \$1999

Business Lease\*: \$76/Mo., 36 Mos.

 **E-VALUE CODE: 03596-890119**

## DELL LATITUDE® CPi D300XT PENTIUM II PROCESSOR AT 300MHz FEATURING MMX TECHNOLOGY

### Network-Optimized Notebook

- 13.3" XGA Active Matrix Display
- 96MB EDO RAM (256MB Max)
- 4GB Ultra ATA Hard Drive
- Modular 24X Max^^ Variable CD-ROM
- Modular Floppy Drive
- NeoMagic 128-bit Graphics Accelerator
- 3D Surround Sound and Software Wavetable
- Intelligent Lithium Ion Battery with ExpressCharge™ Technology
- MS Windows NT® Workstation 4.0
- Touchpad
- 3-Year Limited Warranty†
- 1-Year NBD On-site^ Service

# \$2999

Business Lease\*: \$114/Mo., 36 Mos.

 **E-VALUE CODE: 03596-790129**

## DELL LATITUDE CP M233ST PENTIUM PROCESSOR WITH MMX TECHNOLOGY AT 233MHz

### Network-Optimized Notebook

- 12.1" SVGA Active Matrix Display
- 32MB EDO RAM (128MB Max)
- 4GB Ultra ATA Hard Drive
- Modular 20X Max^^ Variable CD-ROM
- Modular Floppy Drive
- NeoMagic 128-bit Graphics Accelerator
- 3D Surround Sound and Software Wavetable
- Intelligent Lithium Ion Battery with ExpressCharge Technology
- MS Windows NT Workstation 4.0
- Touchpad
- 3-Year Limited Warranty†
- 1-Year NBD On-site^ Service

# \$2199

Business Lease\*: \$83/Mo., 36 Mos.

 **E-VALUE CODE: 03596-790121**

## DELL NOTEBOOK AWARD INFO™

- Two-time "A" rating in *PC Magazine's* Readers' Choice Awards for Service and Reliability.
- Latitude Line – *PC Computing's* "Best Overall" Rating Three Years.
- Inspiron 7000 D300GT – *CNET Editors' Choice*.

Advertised configurations vary from award-winning configurations.

### USE THE POWER OF THE E-VALUE™ CODE.

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E-VALUE CODE ONLINE AT [WWW.DELL.COM/EVALUE](http://WWW.DELL.COM/EVALUE), OR GIVE IT TO YOUR SALES REP OVER THE PHONE.

### TO ORDER TOLL-FREE

# 888-395-3437

### BUILD YOUR OWN AND ORDER ONLINE

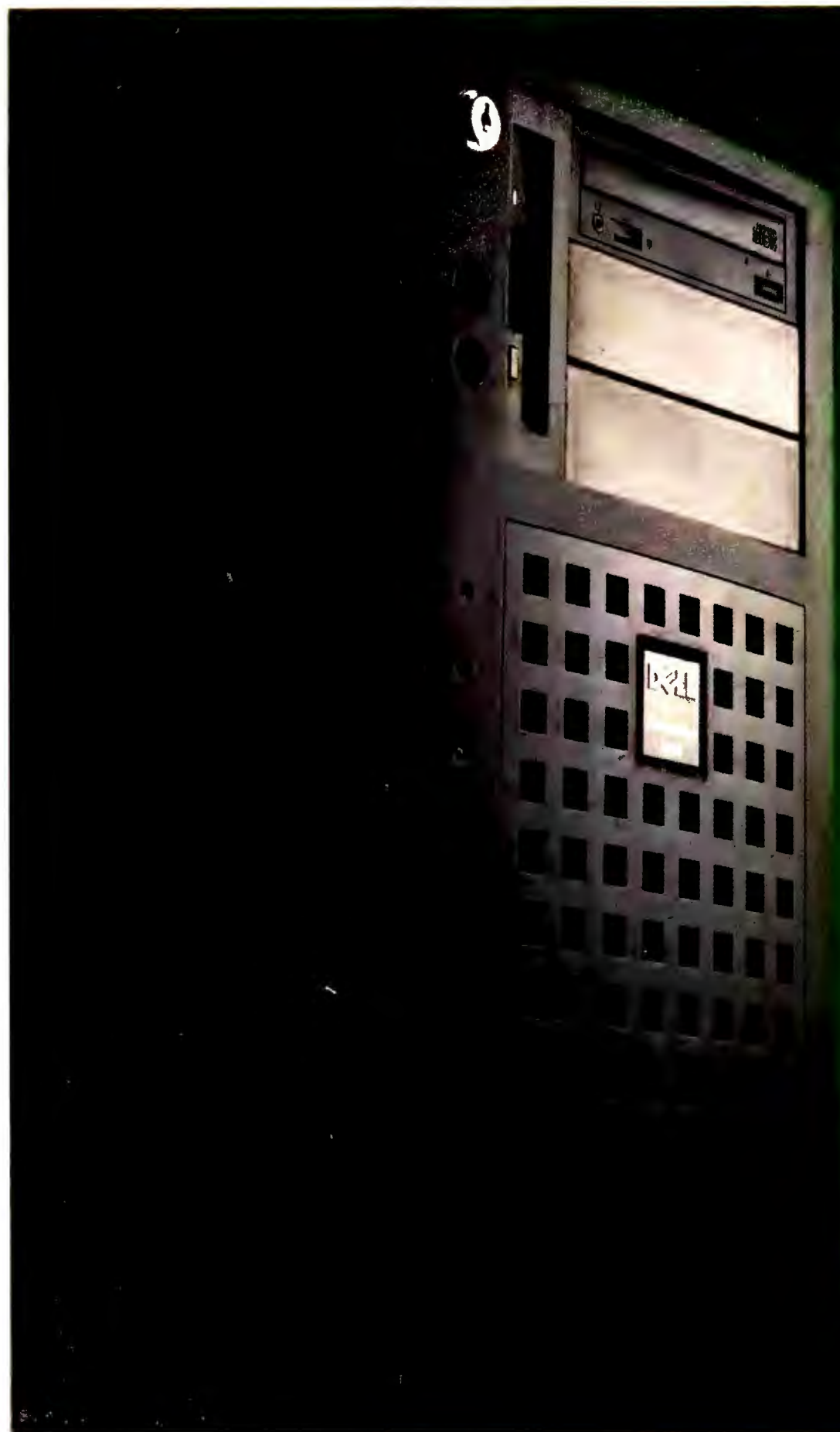
BE DIRECT™

# DELL

 [www.dell.com](http://www.dell.com)



# MAKE THE MOST OF YOUR



Your business depends upon your people. And your people depend on your server. Which is why a mantra at Dell is server reliability, server reliability, server reliability. Every step of the way we build our servers to deliver the most reliable performance possible. We design them to be as low-maintenance as possible. And as easy to upgrade as possible. So you can keep on getting the most out of your people as your business grows. Of course, we back every server with our award-winning service and support, so your IT people can make the most of their time, too. Call us or go to [www.dell.com](http://www.dell.com) today.





# PEOPLE.

## DELL® POWEREDGE® 2300 SERVER PENTIUM® II PROCESSOR AT 350MHz (DUAL PROCESSOR/RAID CAPABLE)

- 64MB 100MHz ECC SDRAM
  - 512KB Integrated L2 ECC Cache
  - 4GB Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
  - 32X Max<sup>^</sup> Variable SCSI CD-ROM Drive
  - HP® OpenView™ NNM Special Edition
  - Intel® Pro/100+ PCI Ethernet Adapter
  - Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
  - 6 Expansion Slots: 4 PCI, 2 PCI/ISA
  - 4-1.6" or 6-1" Hard Drive Bays
  - 3 External 5.25" Drive Bays plus Dedicated 3.5" Floppy Drive Bay
  - 3-Year NBD On-site<sup>^</sup> Service
  - 7x24 Dedicated Server Hardware Technical Telephone Support
- ★ Upgrade to a Pentium II Processor at 400MHz, add \$300.

### \$2449

Business Lease<sup>o</sup>: \$93/Mo., 36 Mos

 **E-VALUE CODE: 03597-290124**

## DELL POWEREDGE 2300 SERVER PENTIUM II PROCESSOR AT 400MHz (DUAL PROCESSOR/RAID CAPABLE)

- 128MB 100MHz ECC SDRAM
- 512KB Integrated L2 ECC Cache
- 9GB Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
- 32X Max<sup>^</sup> Variable SCSI CD-ROM Drive
- Microsoft® Windows NT® Server 4.0 (10 Client Access Licenses)
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 4-1.6" or 6-1" Hard Drive Bays
- 3 External 5.25" Drive Bays plus Dedicated 3.5" Floppy Drive Bay
- 3-Year NBD On-site<sup>^</sup> Service
- 7x24 Dedicated Server Hardware Technical Telephone Support

### \$3999

Business Lease<sup>o</sup>: \$151/Mo., 36 Mos.

 **E-VALUE CODE: 03597-290139**

## DELL POWEREDGE 2300 SERVER PENTIUM II PROCESSOR AT 450MHz (RAID 5 CONFIGURATION)

- 128MB 100MHz ECC SDRAM
- 512KB Integrated L2 ECC Cache
- Three 9GB Ultra-2/LVD SCSI Hot-Swap Hard Drives
- Ultra-2/LVD PowerEdge Expandable RAID Controller 2/SC
- 32X Max<sup>^</sup> Variable SCSI CD-ROM Drive
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 6-1" Hard Drive Bays
- 3 External 5.25" Drive Bays plus Dedicated 3.5" Floppy Drive Bay
- 3-Year NBD On-site<sup>^</sup> Service
- 7x24 Dedicated Server Hardware Technical Telephone Support

### \$5499

Business Lease<sup>o</sup>: \$202/Mo., 36 Mos.

 **E-VALUE CODE: 03597-290154**

## NEW/DELL POWEREDGE 4300 SERVER PENTIUM II PROCESSOR AT 450MHz (DUAL PROCESSOR/RAID CAPABLE)

- 128MB 100MHz ECC SDRAM
- 512KB Integrated L2 ECC Cache
- 18GB Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
- 32X Max<sup>^</sup> Variable SCSI CD-ROM Drive
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- Redundant Hot-Swap Power Supplies, Cooling Fans and Processor Fans
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 10 Bays: 6 Drive Bays, 4 Media Bays
- 3-Year NBD On-site<sup>^</sup> Service
- 1-Year DirectLine<sup>SM</sup> Network Operating System Support
- 7x24 Dedicated Server Hardware Technical Telephone Support

### \$5999

Business Lease<sup>o</sup>: \$220/Mo., 36 Mos.

 **E-VALUE CODE: 03597-290159**

## NEW DELL POWEREDGE 4300 SERVER DUAL PENTIUM II PROCESSORS AT 350MHz (DUAL PROCESSOR/RAID 5 CONFIGURATION)

- 128MB 100MHz ECC SDRAM
- 512KB Integrated L2 ECC Cache
- Three 9GB Ultra-2/LVD SCSI Hot-Swap Hard Drives
- Ultra-2/LVD PowerEdge Expandable RAID Controller 2/SC
- 32X Max<sup>^</sup> Variable SCSI CD-ROM Drive
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- Redundant Hot-Swap Power Supplies, Cooling Fans and Processor Fans
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 10 Bays: 6 Drive Bays, 4 Media Bays
- 3-Year NBD On-site<sup>^</sup> Service
- 1-Year DirectLine NOS Support
- 7x24 Dedicated Server Hardware Technical Telephone Support

### \$7449

Business Lease<sup>o</sup>: \$270/Mo., 36 Mos.

 **E-VALUE CODE: 03597-290174**

## DELL POWEREDGE 6300 SERVER PENTIUM II XEON™ PROCESSOR AT 400MHz (QUAD PROCESSOR CAPABLE)

- 128MB ECC EDO Memory
- 512KB Integrated L2 Cache/Processor
- Three 9GB Ultra-2/LVD SCSI Hot-Swap Hard Drives
- Ultra-High Performance 64-bit Ultra-2/LVD PowerEdge Expandable RAID Controller 2
- 32X Max<sup>^</sup> Variable SCSI CD-ROM Drive
- HP OpenView NNM Special Edition
- Intel Pro/100+ PCI Ethernet Adapter
- Integrated Dual Ultra-2/LVD and Ultra/Narrow SCSI Controllers
- Redundant Hot-Swap Power Supplies, Cooling Fans and Processor Fans
- 7 Expansion Slots: 4x64-bit, 3x32-bit
- 10 Bays: 6 Drive Bays, 4 Media Bays
- 3-Year NBD On-site<sup>^</sup> Service
- 1-Year DirectLine NOS Support
- 7x24 Dedicated Server Hardware Technical Telephone Support

### \$11,899

Business Lease<sup>o</sup>: \$421/Mo., 36 Mos.

 **E-VALUE CODE: 03597-290101**



## DELL SERVER AWARD INFO<sup>††</sup>

- *Network World* "World Class Award" for flexibility, serviceability and manageability – Dell PowerEdge 2300.
- *Computer Shopper* "Top 100" – Dell PowerEdge 2300.
- *PC Computing's* "The 'A' List" – Dell PowerEdge 6300.

Advertised configurations vary from award-winning configurations.



**USE THE POWER OF THE E-VALUE™ CODE.**

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E-VALUE CODE ONLINE AT [WWW.DELL.COM/EVALUE](http://WWW.DELL.COM/EVALUE), OR GIVE IT TO YOUR SALES REP OVER THE PHONE.

**TO ORDER TOLL-FREE**

**888-395-3437**

**BUILD YOUR OWN AND ORDER ONLINE**

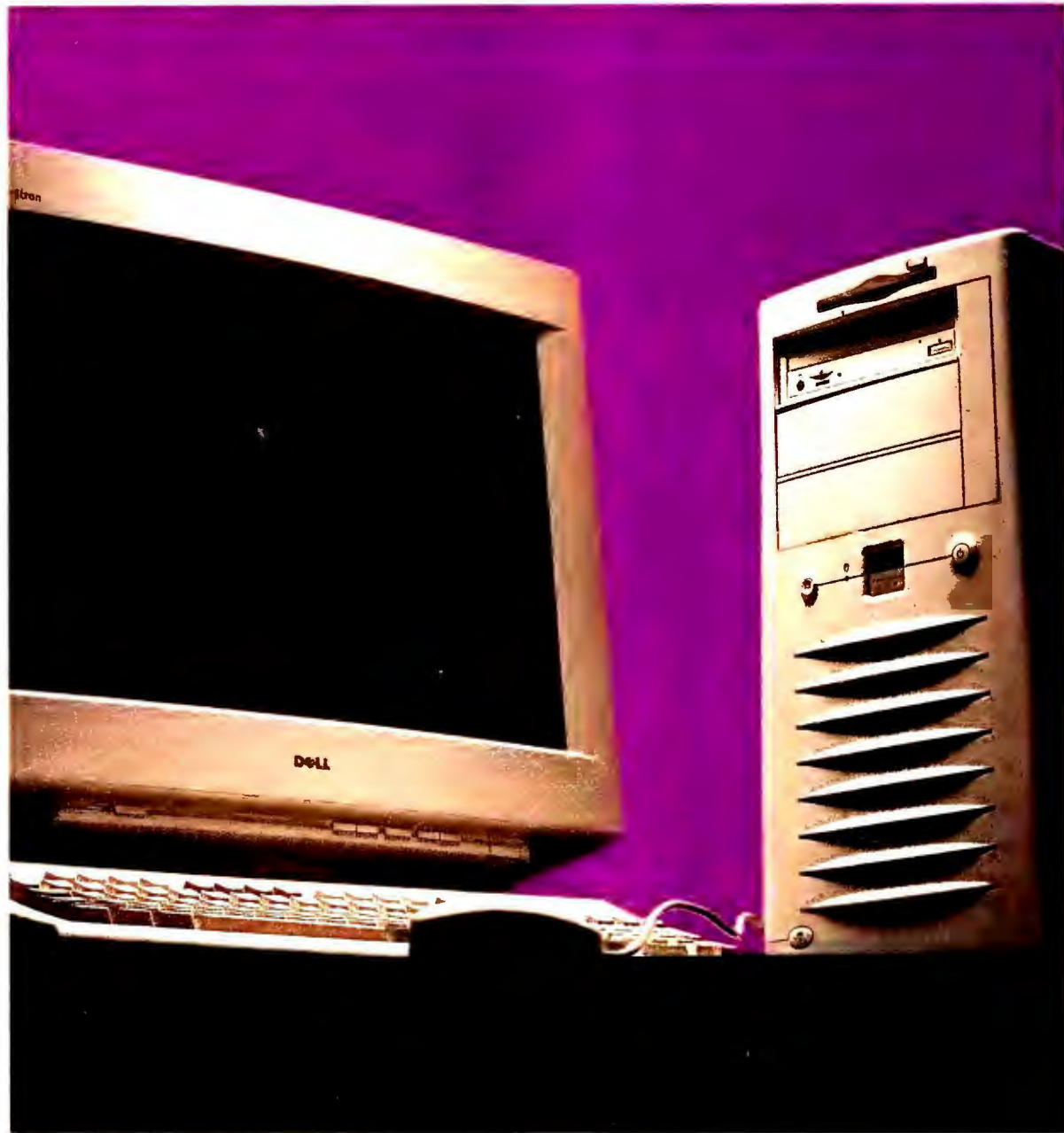
For added redundancy and increased availability, turn to the PowerEdge 4300 and 6300 servers. Call for details.

**BE DIRECT™**  
  
[www.dell.com](http://www.dell.com)



MAKE THE MOST OF

# YOUR TALENT.



Get a machine that really helps you unleash your creative talent. An Intel-based workstation custom built to your exact specifications for the work that you do. Like a Dell Precision™ WorkStation 610 or 410 with single or dual Pentium® II Xeon™

or Pentium II processors. Designed for high-performance, memory-intensive applications with a wide range of graphics card options for 2D and 3D OpenGL applications. It delivers a powerful and affordable alternative to proprietary and expensive RISC/UNIX systems. Plus, software certification essential for your business and 7x24 dedicated service and support. So get a machine configured to your specific talents at [www.dell.com](http://www.dell.com), or call today.



## DELL PRECISION™ WORKSTATION 610 NEW PENTIUM® II XEON™ PROCESSOR AT 450MHz (DUAL PROCESSOR/RAID CAPABLE)

- 128MB 100MHz ECC SDRAM
- 512KB Full-Speed Integrated L2 Cache
- 9GB Ultra-2/LVD SCSI Hard Drive
- 21" (19.8" viewable, .26dp) Trinitron® 1600HS Monitor
- 3D/abs Oxygen GMX 2000 Graphics Card
- 40X Max™ Variable CD-ROM Drive
- Sound Blaster Pro Compatible Sound
- 3Com® 10/100 PCI NIC
- Remote Client Manageability Support via DMI 2.0; Wakeup on LAN Capable
- **MS® Windows NT® 4.0 and 1-Year NT Telephone Support**
- 3-Year NBD On-site<sup>Δ</sup> Service
- 7x24 Dedicated Workstation Hardware Telephone and Online Technical Support

**\$5979**

Business Lease<sup>Δ</sup>: \$220/Mo., 36 Mos.

 **E-VALUE CODE: 03598-490159**

## DELL PRECISION WORKSTATION 410 PENTIUM II PROCESSOR AT 400MHz (DUAL PROCESSOR/RAID CAPABLE)

- 128MB 100MHz ECC SDRAM
- 512KB Integrated L2 Cache
- 4GB Ultra-2/LVD SCSI Hard Drive
- 17" (15.9" viewable) 1000LS Monitor
- Diamond 8MB AGP Graphics Card
- 40X Max™ Variable CD-ROM Drive
- Sound Blaster Pro Compatible Sound
- harman/kardon HK-195 Speakers
- 3Com 10/100 PCI NIC
- Remote Client Manageability Support via DMI 2.0; Wakeup on LAN Capable
- **MS Windows NT 4.0 and 1-Year NT Telephone Support**
- 3-Year NBD On-site<sup>Δ</sup> Service
- 7x24 Dedicated Workstation Hardware Telephone and Online Technical Support

**\$2999**

Business Lease<sup>Δ</sup>: \$114/Mo., 36 Mos.

 **E-VALUE CODE: 03598-490129**



### USE THE POWER OF THE E-VALUE™ CODE.

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E-VALUE CODE ONLINE AT [WWW.DELL.COM/EVALUE](http://WWW.DELL.COM/EVALUE), OR GIVE IT TO YOUR SALES REP OVER THE PHONE.


**TO ORDER TOLL-FREE**

**888-395-3437**

**BUILD YOUR OWN AND ORDER ONLINE**

**BE DIRECT™**

**DELL**

 [www.dell.com](http://www.dell.com)



MAKE THE MOST OF

# THE INTERNET.

Introducing E•value. Doing business with Dell has never been easier. E•value is a fast, online shortcut to the computer system you want with its latest pricing. Simply log onto our website at [www.dell.com/evalue](http://www.dell.com/evalue) and enter the E•value code for the system you want. You'll be automatically taken to that system's page in our online store. Then you can view the latest pricing, customize the system any way you like, and order online quickly and easily. Try it today.

1 USE THIS

- MS Office 98 Professional Edition
- Telephone Support
- 3-Year NBD On-site Service
- 7x24 Dedicated Workstation Hardware Telephone and Online Technical Support

**\$2199**

Business Lease\*: \$83/Mo., 36 Mos.

 **E-VALUE CODE: 31231-123122**

2 GO TO THIS

**E•VALUE**  
YOUR DIRECT LINK TO THE PRODUCT YOU WANT  
[www.dell.com/evalue](http://www.dell.com/evalue)

3 ENTER THIS

☐ HOME ☐ SMALL BUSINESS

ENTER YOUR E•VALUE CODE

-

4 BUILD THIS

**CUSTOM CONFIGURE YOUR SYSTEM**

☐ standard view ☐ all options view ☐ price/view

2 component selections may require changes to other system options. Please check below.

**Dell Dimension XPS R MiniTower**  
Pentium®III processor, 450MHz with 512KB L2 Cache

**Memory**  
128MB SDRAM

**Hard Drive**   
14.4GB Ultra ATA Hard Drive (7200 RPM)

**Monitor**   
21" (19.8" viewable), 26dp Trinitron® 1600HS Monitor (add \$531)

**Video Card**   
NEW 16MB STB nVidia TNT 3D AGP Graphics Card

☒ Please review the following regarding your Video selection:  
• Not available on the 4.8X DVD with Software Decoding

**DVD-ROM or CD-ROM Drive**   
4.8X DVD-ROM Drive and Decoder Card

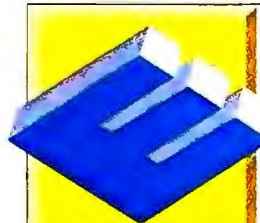
☒ Please review the following regarding your DVD selection:

5 AND GET THIS

**Latest price**

Your Price\*: **\$2,169**

Business Lease\*\*: **\$82/month\***(36 mos.)

**USE THE POWER OF THE E•VALUE™ CODE.**

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E•VALUE CODE ONLINE AT [WWW.DELL.COM/EVALUE](http://WWW.DELL.COM/EVALUE), OR GIVE IT TO YOUR SALES REP OVER THE PHONE. ALSO, GO ONLINE TO DESIGN YOUR IDEAL COMPUTER, CHECK THE LATEST PRICES AND GET 24-HR. ONLINE TECH SUPPORT.

**BE DIRECT™**



 [www.dell.com](http://www.dell.com)

Pricing not discountable. \*Prices and specifications valid in U.S. only and subject to change without notice. †For a complete copy of Guarantees or Limited Warranties, write Dell USA, L.P., Attn: Warranties, One Dell Way, Round Rock, TX 78682. ‡At-home and on-site service provided via service contract between customer and third party provider, and is not available in certain remote areas. Technician dispatched if necessary pursuant to phone based troubleshooting with technical support. 40X Max/17X Min = 32X Max/4X Min. \*\*24X Max/10X Min. \*\*20X Max/9X Min. \*Download speeds limited to 53Kbps. Upload speeds are less (in the 30Kbps range) and vary by modem manufacturer. Speeds also vary depending on the connection. Analog phone line and computer server equipment required. \*\*Computer Shopper 11/98, CNET 9/98, Fortune 11/98, Network World 6/98, PC Computing 4/98 and 9/98, PC Magazine 7/98 and Windows Magazine 10/98. Offer expires 1/30/99. Limit one per household. Not valid with other Hewlett-Packard offers unless otherwise specified by that offer. Customer will mail in completed rebate coupon and original or copy of receipt(s) dated from 10/20/1998 to 1/30/1999 for all products. Submissions must be postmarked no later than 1/30/1999. Customer will receive a \$50 rebate check, approx. 8-10 weeks after receipt of rebate materials. \*Maximum RAM configurations require a factory installed 128MB SoDIMM, which must be installed at time of initial purchase. Inside logo and Dell are registered trademarks. Pentium II, Xeon, MMX and Celeron are trademarks of Intel Corporation. MS, Microsoft, BackOffice, IntelliMouse, Windows NT and Windows are registered trademarks of Microsoft Corporation. 3Com and registered trademarks and Fast Ethernet are trademarks of 3Com Corporation. HP and DeskJet are registered trademarks and OpenView is a trademark of Hewlett-Packard Corporation. Trinitron is a registered trademark of Sony Corporation. ©1999 Dell Computer Corporation. All rights reserved.



## YOUR QUESTIONS ON: Going back to Windows 95 ♦ Saving electricity

# Reinstate Windows 95, Ever So Patiently



I'VE BEEN HAVING problems with Window 98 and want to go back to Windows 95. I'd upgraded to FAT32, which my version of Windows 95 doesn't support, so I tried to use a third-party utility to reconvert to FAT16. But now when I try to reinstall Windows 95, a dialog box warns me that if I proceed I could render both operating systems useless. Is there any way I can return to Windows 95 safely?

Bill Schaper, St. Louis

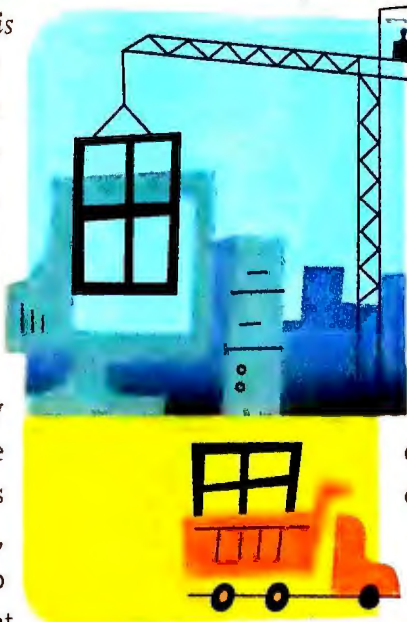
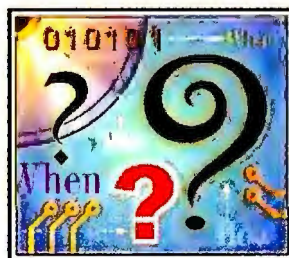
ONCE YOU convert your system to FAT32, you can't easily go back. (Read more about these file systems in *Windows NT* on page 236.) Here's a step-by-step way to restore Windows 95, but the job is dangerous and difficult—and it may not even work. If you have all your application disks and can back up your data, the best option may be to count your losses, reformat the hard disk, and reinstall everything.

Assuming you want to proceed with the attempted rescue, you first need to back up all your data and key configuration information (including stuff like Internet access settings and passwords). To get started, select *Start•Shutdown•Restart in MS-DOS mode*. Place your Windows 95 CD into its drive, and at the DOS prompt, type **d:setup**, where *d*: is your CD-ROM drive. When asked if you really want to do this—and you'll be asked often—click yes.

## GET USED TO THOSE ERRORS

AT THIS POINT, you'll see a dialog box that reads, 'A file being copied is older than the file currently on your computer. It is recommended that you keep your existing file.' Select *No to All*.

The fun really begins when you boot into Windows 95. You'll get a passel of error messages, most complaining about files that can't be found or launched. The first prompts will flash by too quickly to read, but eventually you'll



see a series of 'Cannot find a device file' messages, each offering half a screen of explanatory text and a 'Press any key' prompt. Write down the file names before continuing. After your PC switches from text to graphics mode, you'll get additional error messages. Again, write down the names of the files and the programs that are causing problems.

To fix the first set of errors, you must edit *msdos.sys*. Select *Start•Shutdown•Restart in MS-DOS Mode*, and type the following commands, in sequence, at the prompt:

```
attrib -r -h -s \msdos.sys
start /w notepad c:\msdos.sys
attrib +r +h +s \msdos.sys
```

You can open *msdos.sys* manually by doing the following:

1. Open *My Computer* and select *View•Options*. On the View tab, select *Show all files*, then click OK.
2. Right-click *msdos.sys* and select *Properties*. Uncheck *Read-only*, then click OK.
3. Select *Start•Run*. Enter the command **notepad c:\msdos.sys** and press **<Enter>**.

No matter how you open *msdos.sys*, go to the end of the file and delete the lines that follow the large block of Xs—these

## Convert BMPs to Icons

YOU CAN TURN ANY .bmp file into an icon simply by changing its extension to .ico. Click the bitmap file you want to change, select *File•Rename*, and then replace the .bmp extension with .ico. Press **<Enter>**, and Windows will immediately replace the application icon with a tiny version of the image. Keep in mind that the icon image may look small, but Windows must still deal with the contents of the .bmp file. System performance will suffer if Windows must redraw dozens of these images.

are Windows 98-specific commands that confound Windows 95. Exit Notepad and save the file. Now turn the read-only option on *msdos.sys* back on. Reboot, and make sure that the first set of errors—the group that flashed by too fast for you to read—isn't there anymore.

## FIND THE CAUSE

YOU'LL HAVE TO FIX the other errors one at a time. Repeat these steps for each error message to eliminate its cause:

1. Select *Start•Run*, enter the command **regedit**, and press **<Enter>**.
2. Press **<Ctrl>-F**. In the 'Find what' field, enter the file name from the error message—without the extension. For instance, if the error is 'Cannot find file *ntkern.vxd*', enter *ntkern*. Press **<Enter>**.
3. When the search stops, delete the highlighted key or value (a *key* is an entry in the left pane that looks like a folder, and a *value* is found in the right pane and looks like a tiny page). Confirm the deletion, then press **<F3>** to find the next occurrence of the name. Repeat the process until the file is no longer mentioned.
4. When you've removed all mentions of the file, close RegEdit and reboot. That particular error message should no longer appear. If the error persists, you may need to repeat the previous step, because some stray references to that driver may have eluded you during the first attempt.

Further tweaking may be needed. For instance, when I tested this tip, I had to reinstall the driver for my Matrox Mys-



## Norton Utilities

List price \$60, Symantec, 800/441-7234, [www.symantec.com/nu](http://www.symantec.com/nu)

PC WORLD INFONET NO. 718

## Nuts & Bolts 98

List price \$49, Network Associates, 800/338-8754, [www.nai.com](http://www.nai.com)

PC WORLD INFONET NO. 719

## GetRight

\$18 registration fee, HeadLight Software, [www.getright.com](http://www.getright.com)

tique video card. Again, no promises, but this recourse is your best hope for restoring Windows 95.

### TOO GOOD TO BE TRUE?



I USE A SECOND hard drive to back up my primary one. Since hard disks are so inexpensive, I wonder why this method isn't more prevalent. Is there an inherent weakness in my solution?

*Michael Averill, Val-David, Quebec*

BACKING UP A HARD DRIVE to a second hard drive is easy and fast, but not carefree. You can't easily separate an internal hard drive from your computer, the way you can separate tape or other removable media. That means your backed-up data is not protected against power surges, fire, or theft.

### WATTS YOUR COMPUTER USING?



HOW MUCH ELECTRICITY does a PC use? My college-student daughter never turns off her PC and monitor, and her roommates are concerned that she's adding too much to the electric bill.

### IT PAYS TO POWER DOWN MONITORS

COMPONENT	Full use (watts)	Idle (watts)	Power-saving mode	Annual cost*		
				Always on	With power-saving mode	On during work hours only
System unit	80-200	36-70	28-30	\$48-\$105	\$42-\$72	\$19-\$48
14-inch monitor	80-100	n/a	5-8 <sup>1</sup>	\$84-\$105	\$23-\$30	\$19-\$24
17-inch monitor	100-160	n/a	1-8 <sup>1</sup>	\$168-\$168	\$39-\$45	\$38-\$38
Laser printer	120-170	n/a	5-7	n/a	\$33-\$46	\$29-\$41
Ink jet printer	12-30	n/a	1-5	n/a	\$4-\$11	\$3-\$7

<sup>1</sup> Monitors usually have two modes to save power: standby and sleep. The numbers listed here are for the sleep mode.

<sup>2</sup> Based on 12 cents per kilowatt hour. Assumes 50 40-hour work weeks a year.

I suspect that their hair dryers use more power than the PC. Is there a way to calculate this usage and its cost?

*Gene Burch, Temecula, California*

SURE, MINUTE FOR MINUTE, a computer and a monitor use a lot less electricity than a hair dryer, but I sincerely doubt that these students keep their hair dryers humming "24/7."

How much power a computer consumes depends on its processor, components, and design and the amount of time it is actively in use. Not uncommonly, a computer designed to handle 200 watts (exclusive of the monitor) draws about 100 watts when in use and 50 when idle.

The real power hog is the monitor.

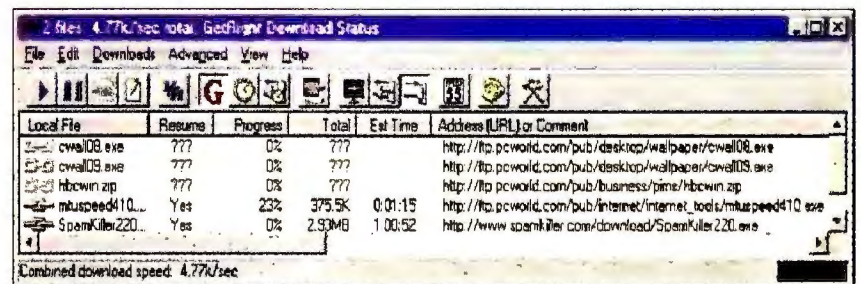
A 17-inch monitor that's left on all the time can easily use 160 watts; even a 14-inch model can consume 100. Do the math: At an average cost of 12 cents per kilowatt

hour, a 17-inch monitor that never goes to sleep will cost over \$150 a year to operate. See **FIGURE 1** for details on other peripherals and their juice consumption.

If your daughter must keep her PC on, she should use its power-saving features. Unless her monitor is more than three or four years old, it is almost certainly Energy Star compliant. She can set the power saving options by right-clicking the desktop, selecting *Properties*, and clicking the

## Download Lots of Files

IF YOU USE A modem, downloading lots of files off the Web is a pain. With each file you start downloading, surfing speed diminishes; and if you have six or seven files to download, Web browsing comes to a screeching halt. HeadLight Software's GetRight manages downloads and makes them easy. Just click a file in your browser, and GetRight puts it in its database (see **FIGURE 2**). It will automatically dial in to your Internet service provider and download the files while you do something that doesn't require bandwidth—like sleep. As a bonus, this utility will also resume failed downloads so you don't need to wait another hour for that 20MB file to download. GetRight is available on FileWorld.



**FIGURE 2: GETRIGHT LETS YOU schedule overnight file downloads and resumes partial (failed) downloads so you don't have to start over.**

Screen Saver tab. She'll get options at the bottom of the window to send the monitor to standby mode—where it uses about 20 percent of full power—or to shut it off almost entirely during idle usage.

Your daughter is less likely to have a computer that goes into power-saving mode. Tell her to run the following sequence: From the Windows desktop select *Start•Help*, click the *Index* tab, and type **power**. Double-click *Suspend command, showing or hiding*. In the resulting Help window, click the arrow icon. She'll get either a pop-up box saying that her computer doesn't support power management or a dialog box of options. But today's computers aren't all that energy efficient; most of them still gobble up about 30 watts even when powered down.



Find more tips at [www.pcworld.com/heres\\_how](http://www.pcworld.com/heres_how). Find files mentioned in this article at [www.fileworld.com/magazine](http://www.fileworld.com/magazine). We welcome questions and tips and pay \$50 for published items. Humor columnist Lincoln Spector is a PC World contributing editor. See page 14 for contact information. ■



Protect your privacy ♦ Learn to read e-mail headers ♦ Make your e-mail sing

# Teach Your Old Browser New Navigation Tricks

WHEN YOU CLICK Internet Explorer's Search button, the browser brings up a special search menu in its Explorer Bar—a pane to the left of the browser. What makes using this search bar better than heading to the search site itself? All the search results display in the left pane, so you don't have to keep clicking the Back button to return to the search site. You can toggle the search frame on and off by clicking the Search button.

If you're using Internet Explorer 4, you can configure your browser to rely on almost any search engine. Set this preference on [home.microsoft.com/search/lobby/searchsetup.htm](http://home.microsoft.com/search/lobby/searchsetup.htm). IE 5 makes things easier still, by combining several search engines into a one-stop search tool. With IE 5, the key to effective searching is the Next button in the search bar, which lets you scroll through results from all participating search engines.

with a question mark followed by a space, or with the word **find** or **go** followed by a space.

Navigator's Search button takes you to a search page on Netscape's Web site where you can search with Netscape's own search tool or with AltaVista, Excite, Infoseek, LookSmart, or Lycos. But unlike IE 5, Navigator doesn't pass your query to all these engines simultaneously. Navigator 4.06 and later offer Smart Browsing features that make Web searching equally convenient. When you type keywords (such as **flyfishing gear**) into Navigator's location bar, the browser takes you to Netscape's site and returns a few related URLs. Precede any single-word keyword with a question mark, or Navigator will try to add "www" and "com" to it. You can also drag and drop a phrase from another application (say, a word processor) into the browser window, and Navigator will jump you to a site of the same domain name or will search for that phrase on the Web.



## Rewrite Your History

WANT TO PURGE your PC of all signs that you spent your lunch hour playing bridge with two 16-year-olds from Istanbul? Use SwanSoft's \$15 HistoryKill to erase all the stored URLs in your browser, including those in the History box. You can configure this shareware tool to remove URLs on command or during boot-up. It also removes cache files, cookies, and the Recent document list. It works with IE and Navigator. Get it from [www.swanksoft.com/historykill](http://www.swanksoft.com/historykill) or from [www.fileworld.com/magazine](http://www.fileworld.com/magazine).

## HOME-MADE SPAM FILTER

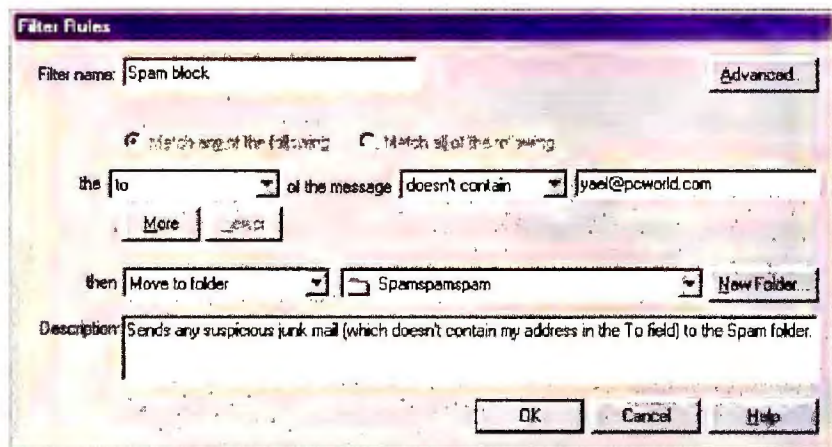
HERE'S A GREAT way to filter out junk e-mail, suggested by Anthony Ferrer via the Internet. Since most spammers send their messages to mailing lists, just set your mail client to reject any message not intended for you personally. In Messenger 4.x, press **<Ctrl>-<Shift>-1** to go to Message Center, and select **Edit•Message Filters**. Name the filter, and then click the down arrow next to all fields in the next line (see **FIGURE 1**) to create an expression that reads "the TO of the message doesn't contain *address@server.com*."

In Eudora (version 3 or higher), select **Tools•Filters** and click next to **Incoming**. Under **Header**, select **To**. Then, in the next line, select **Doesn't Contain**, and type your e-mail address. Under **Action**, select **Transfer**. Click the box to the right of that field and select the mailbox where you want junk mail to be deposited while it awaits future perusal (or deletion).

Outlook Express lacks an option for creating this filter.

## ANATOMY OF AN E-MAIL HEADER

WHETHER YOU SEE it or not, every e-mail message you get comes with a digital "paper trail" known as the e-mail header. Some mail administrators (such as your Internet service provider or your IS manager) may trim these before they reach you, but you see them when others forward you mail. E-mail headers tell you where the message came from, what machines it traveled through in its jour-



**FIGURE 1: TELL NETSCAPE MESSENGER to discard or file away any incoming message that isn't intended for you personally.**

Alternatively, you can find what you're looking for by typing a keyword into IE's address bar. Internet Explorer treats any two or more words, separated by spaces, as a search query and directs these to a special area on Yahoo devoted to IE searches. If the expression you're looking for consists of a single word, precede it

ton, and you'll get a list of URLs that are related to the current Web site. If you like this feature, but your current browser (IE or older versions of Navigator) doesn't support it, download the add-on Alexa from PC World Online's FileWorld. Alexa adds a small pane to the bottom of your browser, where it displays related links.



ney from the sender's mail server to your own. This information is usually discarded and ignored, but you should look for it when you want to track down the source of an insistent spammer.

To view a message's header in Netscape Messenger, select *View•Headers•All*. In Outlook Express, open the message, select *File•Properties*, and click the *Details* tab. In Eudora simply press the button labeled *Blah Blah* at the top of the message.

Reading message headers is an art, because sophisticated spammers can forge certain elements to obscure their

trail. The image in the center of the page shows an example of a message header sent by a spammer whose e-mail address is supposedly `snodgrass@ditznet.com`.

### SET YOUR E-MAIL TO MUSIC

HERE ARE TIPS for setting your e-mail program to play songs, roll drums, or pipe bucolic bleats when important mail comes your way.

**AOL** Tired of those irksome tunes AOL plays whenever "You've got mail" or a file has finished downloading? Kenny S. Lee of Diamond Bar, California, writes that


AOLians can change the music by replacing any of the six sound files in AOL's main directory—`drop.wav`, `welcome.wav`, `filedone.wav`, `goodbye.wav`, `gotmail.wav`, `im.wav`—with other .wav files. (We'd recommend harp music.) Copy your preferred .wav file to the AOL main directory, and rename it with the file name of the AOL tune you're replacing. Or silence AOL's completely by erasing those files.

**Eudora** To have Eudora Pro play a tune to herald e-mail from a specific person, create a filter. Select *Tools•Filters*, and check *Incoming*. After *Header:*, select *From:*. After *Contains*, enter the sender's e-mail address. Under *Action*, select *Play Sound*.

To configure Eudora Pro or Lite to play a favorite tune when mail arrives, select *Options* from the *Tools* menu. Under *Category:*, scroll to and click the *Getting Attention* icon. Place a check beside *Play a Sound*, and click the blank bar beneath it. In the *Select a Sound File* box that appears, browse to your preferred .wav file. Select it and click *Open*. Click *OK*.

**Outlook Express** Head to Windows' Control Panel (*Start•Settings•Control Panel*). Open the *Sounds* icon. In the *Sounds* tab, under *Events:*, scroll to *New Mail Notification*. Browse to the .wav file you wish to play. Select it and click *Apply*. Next, in OE, select *Tools•Options*. In the *General* tab, place a check beside *Play sound when new messages arrive*. Click *OK*.

**Netscape Messenger** To set Messenger to play a sound when new messages arrive, select *Start•Programs•Netscape Communicator•Utilities•Netscape Mail Notification*. A mail icon will appear in your system tray. Right-click it and select *Options*. Choose *Play This Sound File*, and click *Browse*. Find the .wav file you'd like Messenger to play, and click *Open*. You must also configure Messenger to play sounds. From the *Edit* menu, select *Preferences*. Head to *Mail & Groups*, and check *Enable sound alert when messages arrive*. Click *OK*.

 Find files from this article at [www.fileworld.com/magazine](http://www.fileworld.com/magazine). Contributing Editor Judy Heim is a coauthor of *The Quilter's Computer Companion* (No Starch Press, 1997). See page 14 for contact information.

## Anatomy of an E-Mail Header

```
1 From: snodgrass@ditznet.com
2 Received: from little.mx.frogholenet.com (little.mx.frogholenet.com
  [169.207.1.102])
  by big.mx.frogholenet.com (8.0.0) with ESMTP id DAA12539
  for <bob@frogholenet.com>; Mon, 4 Jan 1999 03:46:03 +0000 (CDT)
3 Return-Path: <snodgrass@ditznet.com>
4 Received: from bigdope.gomer.net (root@gomer.net [000.67.176.22])
  by big.mx.frognet.com (8.0.0) with ESMTP id DAA14592
  for <bob@frogholenet.com>; Mon, 4 Jan 1999 03:47:18 +000 (CDT)
5 Message-ID: <34111AF1.34FF@gomer.net>
  Date: Mon, 04 Jan 1999 01:57:21
6 Reply-To: poorchump@mci.net
7 To: undisclosed-recipients:;
  Subject: Act Now! Or It Will Be Too Late!
```

1 This line identifies the message's supposed author, but anyone can fabricate the "From" information in most Internet mail programs.

2 This section records the path the message took through the network of computers at Bob's ISP FrogHoleNet.Com. The mail server named "Big" received the message and sent it to the mail server named "Little"; then Little sent it to Bob's mailbox. At 3:46 a.m. Greenwich Mean Time (which is 7:46 p.m. PST of the previous day), FrogHoleNet.Com received the message. The ESMTP ID is the message's identification number on the originating mail server.

3 Don't trust the accuracy of the Return-Path data. This bit of information is easy to forge—and spammers know it.

4 Another detour: FrogHoleNet.Com's mail server Big received the message, not from a DitzNet computer, but from a computer called Bigdope at an ISP called Gomer.Net. If we had blithely proceeded to send a message of complaint to the mail master at DitzNet (`postmaster@ditznet.com`), as popular wisdom recommends, it would have gone to an ISP that probably had nothing to do with

the spammer or the spam. The trick is to focus instead on the numbers that follow a computer's address (in this particular example, 000.67.176.22); these numbers make up the computer's DNS (domain name server) address, which identifies it to the rest of the Internet. Forward this information to your ISP and request that it block all future messages from that server.

5 The originating mail server assigned this ID number to the e-mail message. This is a final, important clue in ascertaining where a spam originated. Though spammers can forge the From, Return-Path, and Reply-To fields, they can't counterfeit message IDs. Together with the information in the Received field, the data in this line proves conclusively that the message originated at Gomer.Net.

6 This nasty spammer has set up his or her mailing so that any angry replies will get redirected to some poor schlub at MCI.Net. That's why, when you receive a spam, you should refrain from hitting the reply button immediately to dash off a note of outrage.

7 The anonymous To field is the spammer's best friend. It won't help you at all.





# COMPSource

Introducing,  
the computer your desk has been waiting for



starting at **\$845**

(try not to drool on the price...



The Consumers' Choice Award publicly identifies those establishments which have been voted by consumers as being their choice for excellence.

**24/7  
365**

On-line ordering available  
24 hours a day, 7 days a week,  
365 days a year. Over 150,000  
computer products available!



3 years On-Site Service\*  
24/7 tech center for hard-  
ware & software issues.  
Lifetime technical support.

**90**

Convenient payment plans  
including leasing, credit cards, terms  
and 90 days same as cash.

...or the *best warranty* in the industry).

**1.800.413.7361**  
**WWW.C-SOURCE.COM**



## VALULINE PC

AMD K6 3D 266 PROCESSOR  
MICRO-STAR MS-6122 MOTHERBOARD  
ALI ALLADIN CHIPSET

128K INTERNAL CACHE  
PCI ULTRA ATA CONTROLLER

32MB SDRAM  
6.4 GB ULTRA ATA HARD DRIVE

36x CD-ROM  
3.5" FLOPPY DRIVE

YAMAHA 16-BIT SOUND CARD  
15" .28mm AOC NI MULTIMEDIA  
MONITOR W/ SPEAKERS

AGP ATi 4MB GRAPHIC ACCELERATOR  
104 WINDOWS KEYBOARD

2 BUTTON MOUSE  
56K V.90 FAX/MODEM W/ VOICE &  
SPEAKERPHONE INT

ATX MID-TOWER CASE 250W POWER  
WINDOWS 98 PRE-INSTALLED  
3 YEAR WARRANTY

**\$845**

## VALULINE PC II

INTEL CELERON 300MHz PROCESSOR  
MICRO-STAR MS-6122 MOTHERBOARD  
INTEL 440BX CHIPSET

128K INTERNAL CACHE  
PCI ULTRA ATA CONTROLLER

64MB 8ns PC100 SDRAM  
6.4 GB ULTRA ATA HARD DRIVE

36x CD-ROM  
3.5" FLOPPY DRIVE

YAMAHA 16-BIT SOUND CARD  
15" .28mm AOC NI MULTIMEDIA  
MONITOR W/ SPEAKERS

AGP ATi 4MB GRAPHIC ACCELERATOR  
104 WINDOWS KEYBOARD

MS INTELLIMOUSE W/WHEEL  
56K V.90 FAX/MODEM W/ VOICE &  
SPEAKERPHONE INT

ATX MID-TOWER CASE 250W POWER  
WINDOWS 98 PRE-INSTALLED  
3 YEAR WARRANTY

**\$959**

## BUSINESS CLASS II

INTEL PENTIUM II 350MHz PROCESSOR  
MICRO-STAR MS-6119 MOTHERBOARD  
INTEL 440BX CHIPSET

512K INTERNAL CACHE  
PCI ULTRA ATA CONTROLLER

64MB 8ns PC100 SDRAM  
8.4 GB ULTRA ATA HARD DRIVE

36x CD-ROM  
3.5" FLOPPY DRIVE

YAMAHA 16-BIT SOUND CARD  
17" .26mm AOC NI MULTIMEDIA  
MONITOR W/ SPEAKERS

HERCULES TERMINATOR 128 8MB AGP  
104 WINDOWS KEYBOARD

MS INTELLIMOUSE W/ WHEEL  
56K V.90 FAX/MODEM W/ VOICE &  
SPEAKERPHONE INT

ATX MID-TOWER CASE 250W POWER  
WINDOWS 98 PRE-INSTALLED  
3 YEAR WARRANTY, 3 YEAR ON-SITE

**\$1349**

PENTIUM 200MMX.....\$859  
PENTIUM 233MMX.....\$869  
AMD K6 3D 350MHz.....\$955  
AMD K6 3D 400MHz.....\$1099  
MS WORKS 99 DELUXE.....\$75

\*UPGRADE TO 128MB MEMORY.....\$109  
\*UPGRADE TO 8.4GB HARD DRIVE.....\$35  
CELERON 333MHz.....\$989  
CELERON 400MHz.....\$CALL  
ADD MS WORKS 99 DELUXE.....\$75

\*UPGRADE TO 128MB MEMORY.....\$109  
\*UPGRADE TO 11.5GB HARD DRIVE.....\$47  
PENTIUM II 400MHz.....\$1465  
PENTIUM II 450MHz.....\$1655  
ADD OFFICE PRO 97.....\$199

## POWERMEDIA GS II

INTEL PENTIUM II 350MHz PROCESSOR  
MICRO-STAR MS-6119 MOTHERBOARD  
INTEL 440BX CHIPSET

512K INTERNAL CACHE  
PCI ULTRA ATA CONTROLLER

128MB 8ns PC100 SDRAM  
10.1 GB ULTRA ATA HARD DRIVE

36x CD-ROM  
3.5" FLOPPY DRIVE

CREATIVE LABS AWE64 P-N-P  
17" .26mm AOC NI MULTIMEDIA  
MONITOR W/ SPEAKERS

AGP INTEL 1740 8MB  
104 WINDOWS KEYBOARD

MS INTELLIMOUSE W/ WHEEL  
56K V.90 FAX/MODEM W/ VOICE &  
SPEAKERPHONE INT

ATX MID-TOWER CASE 250W POWER  
WINDOWS 98 PRE-INSTALLED  
3 YEAR WARRANTY, 3 YEAR ON-SITE

**\$1475**

## POWERMEDIA PC II

INTEL PENTIUM II 350MHz PROCESSOR  
MICRO-STAR MS-6119 MOTHERBOARD  
INTEL 440BX CHIPSET

512K INTERNAL CACHE  
PCI ULTRA ATA CONTROLLER

128MB 8ns PC100 SDRAM  
13.1 GB ULTRA ATA HARD DRIVE

DVD SECOND GENERATION DRIVE  
3.5" FLOPPY DRIVE

CREATIVE LABS AWE64 P-N-P  
19" .26mm AOC NI MONITOR

ALTEC LANSING ACS45 SPEAKERS W/  
SUBWOOFER  
AGP ATi XPERT 98 8MB  
104 WINDOWS KEYBOARD

MS INTELLIMOUSE W/WHEEL  
56K V.90 FAX/MODEM W/ VOICE &  
SPEAKERPHONE INT

ATX MID-TOWER CASE 250W POWER  
WINDOWS 98 PRE-INSTALLED  
3 YEAR WARRANTY, 3 YEAR ON-SITE

**\$1949**

## CYBERSTAR SE98 NOTEBOOK

AMD K6-2 350MHz PROCESSOR  
12.1" ACTIVE MATRIX DISPLAY SVGA  
INTERNAL 56K V.90 FAX/MODEM

32MB SDRAM EXPANDABLE UP TO 128  
3.2GB REMOVABLE HARD DRIVE

2X DVD-ROM  
MICROSOFT WINDOWS 98

4MB VRAM VIDEO  
3 YEAR PICK-UP WARRANTY



**\$1819**

UPGRADE TO 256MB MEMORY.....\$209  
UPGRADE TO 11.5GB HARD DRIVE.....\$39  
PENTIUM II 400MHz.....\$1645  
PENTIUM II 450MHz.....\$1835  
ADD OFFICE PRO 97.....\$199

\*UPGRADE TO 256MB MEMORY.....\$209  
\*UPGRADE TO 19.2GB HARD DRIVE.....\$115  
PENTIUM II 400MHz.....\$2085  
PENTIUM II 450MHz.....\$2269  
ADD OFFICE PRO 97.....\$199

ADD OFFICE PRO 97.....\$199  
UPGRADE TO 64MB.....\$55

CALL FOR OUR FULL LINE OF NOTEBOOKS

CompSource is not only a direct vendor of desktop and notebook systems, but also, as the name indicates, a source of PC components from most every major vendor of parts. So it's no surprise that they can pick and choose among the best of these for it's own assemble-to-order PCs."

Computer buyer's guide and handbook/October 1998

With unsurpassed customer service, uncompromising quality, and knowledgeable technical support, you will see why we are "Simply better."

CompSource, Inc. All rights reserved. All prices are subject to change without notice. Shipping charges, software and custom configured systems are not refundable. No refunds after 30 days. Not responsible for any errors or typographical errors. All returned items must have a RMA number and be in original packaging. 15% restocking fee may apply to returns. On-site service provided at sole discretion of CompSource Inc. \*ValuLine systems excluded.

Circle 43 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

All major  
Credit Cards Accepted

**1.800.413.7361**  
shop on our web site at  
**www.c-source.com**



# Create Instant Graphics Shortcuts in Word

WANT TO INSERT an oft-used image into your documents without futzing with menus and dialog boxes? There's an easy way to do it in Word 6.0 and later:

1. Open a new document in Word and select **Insert•Picture**. In the resulting dialog box, choose the image you plan to use frequently. (In Word 97, you must select the image's type from a submenu before you'll see a list of images.) Click **OK** or **Insert** to insert the image into the blank document.

2. Click the picture in the document to select it.

3. In Word 6 and Word 95, select **Edit•AutoText**. In the AutoText dialog box, you'll see a preview of the graphic (see **FIGURE 1**). Type an abbreviation, such as **logo1**, in the Name box, and then click **Add**.



In Word 97, select **Insert•Autotext•New**. Type an abbreviation, such as **logo1**, in the Create AutoText dialog box, and click **OK**.

4. To insert the image in another document at any time, type the abbreviation you selected and then press **<F3>**. The image will appear at the cursor location.

## PICK YOUR DEFAULT TEMPLATE

USERS WHO NEED to work from a specific template in Word (other than the default one) often use the **File•New** command right after launching Word to start a new document and pick a template. But if you almost always use a particular template, why not make it the default and save yourself a few keystrokes? Here's how to substitute another template for the default **normal.dot** template:

1. Exit all open copies of Word.
2. Use File Manager (in Windows 3.1) or

Explorer (in Windows 9x) to find the version of **normal.dot** that goes with your version of Word. Can't locate it?

Select **Tools•Find•Files or Folders** or use File Manager's **File•Search** command, and search for **normal.dot**.

3. Select **normal.dot** from the choices in the file list; then select **File•Rename** and type **default.dot**. Next, press **<Enter>**. In Explorer, right-click the file and select **Rename**. This step will preserve the original file in case of a mishap.

4. Locate and select the file you want to use as the new default template.

5. Select **File•Rename** and type **normal.dot**.

From now on, Word will automatically load the new **normal.dot** template at launch. Whenever you want to use the plain old template, simply select **File•New** and choose the **default.dot** template that you created earlier.

If you run Word in a networked environment, consult your IS department before making any changes.

## SIMPLIFY WORD 97'S INTERFACE

IF YOU'RE LIKE MOST people, there are many Word 97 menu commands and toolbar options you never use. Wouldn't it be convenient if you could strip down Word's baroque interface to suit your needs and dump the dross? You can.

1. Exit all open copies of Word.
2. Using **Start•Find**, locate **normal.dot** on your hard disk.



## A Quick Format Undo in Word

IF YOU'VE CREATED a large block of text that includes boldface, italics, or underlines, you can eliminate all the special formatting in one quick pass. First, make the entire selected text assume that formatting: Select the block of text, and click the appropriate toolbar buttons for boldfacing, italicizing, or underlining. Then click those same toolbar buttons again to remove the formatting.

To remove *all* formatting from your text and revert to the default style, select the text and press **<Ctrl>-<Shift>-Z**.

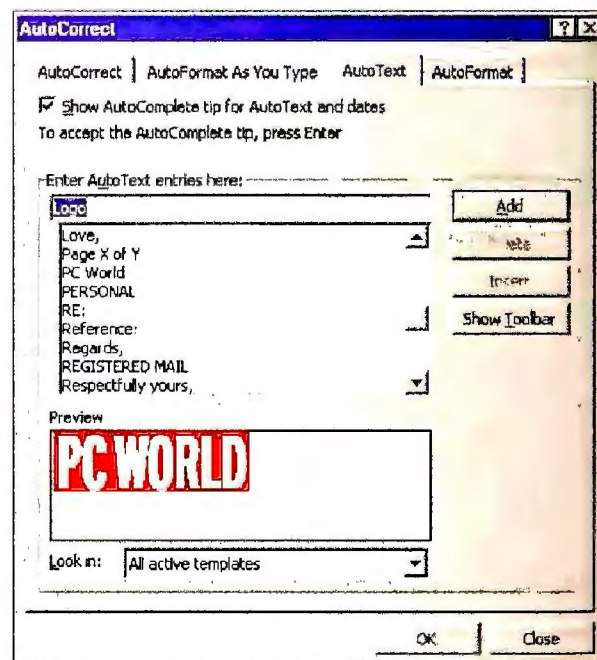
3. Select **normal.dot** and then select **File•Rename**. Type **default.dot** and press **<Enter>**. Doing this preserves the original **normal.dot** file so you can revert to the full interface later if you wish.

4. Start Word 97. If you've renamed **normal.dot**, the program will create a fresh version with all its factory defaults.

5. Select **Tools•Customize**. Click the **Toolbars** tab (see **FIGURE 2**).

6. Get rid of any unwanted toolbars by removing the check mark from the box to the left of those toolbar names. Mark any toolbars you want visible by clicking the box to the left of those toolbar names so that a check mark appears there.

7. Click the **Commands** tab in the Customize dialog box; then click any icons you never use, drag them to the document



**FIGURE 1: HANDY MISNOMER:** Word's AutoText lets you create shortcuts to embed images.





FIGURE 2: THE CUSTOMIZE dialog box helps you configure your toolbars and menus.

window, and drop them there. Not sure of an icon's function? Right-click it and read its name in the context menu.

8. Keep the Customize dialog box open as you click each main menu command and examine the submenu commands that appear. If you find a command you *never* use, click and drag it to the document screen. A triangle will appear to the right of menu commands that have submenus. Remove individual submenu items by clicking them and dragging them down, off the toolbar or menu.

9. To activate your changes, click *Close* in the Customize dialog box. **Note:** Any time before you close the Customize dialog box, you can click *Reset* to undo all the changes you've made up to that point. But once you close the dialog box, you can't undo the changes from within Word.

10. If you wish, you can change other default settings from the Options dialog box (select *Tools•Options*) and in the View menu's *Toolbar* item.

11. Exit Word. The next time you run it, you'll see your changes implemented as the new default interface. Your formerly complex program is now tamed and customized to suit your precise needs.

This tip also works well if you want to hide tricky or treacherous features from innocent novices or subordinates in the office. If you need to regain the full Word interface temporarily, select *File•New*; then select the *default.dot* template you created in step 3, and click *OK*. To return to Word's defaults permanently, exit

Word, delete *normal.dot*, and rename *default.dot* back to *normal.dot*.

**Hint:** If you foul up Word's interface irreparably or if you inherit a PC with a scrambled Word interface, and you need to reinstate Word's original default settings, simply delete *normal.dot* when Word isn't running. The next time you run Word, the program will create a new template that uses the Word default settings. All versions of Word can do this.

## REMOVE ITEMS FROM LETTER WIZARD LISTS



I RECENTLY WROTE a business letter in Word 97, using the Letter Wizard for the first time. Under the *Other Elements* tab, I checked the *References Line* box and typed in my reference number. Now that number permanently appears in the *Reference Line* pull-down menu. How can I delete this number?

*Sheldon Friederich, Zellwood, Florida*  
THIS IS A FLAW in Letter Wizard. If you type new text in any of the lists that appear under the *Other Elements* tab, your addition becomes a permanent part of the wizard. Fortunately, you can easily clear unintended entries, which, oddly enough, Word stores as *AutoText*. To remove an entry, select *Tools•AutoCorrect*, and click the *AutoText* tab (see FIGURE 3). Scroll down the list of *AutoText* entries until you find the item you unwittingly inserted into the Letter Wizard. Select it, click *Delete*, and then choose *OK*. It'll be gone the next time you use the Letter Wizard.



FIGURE 3: THE LETTER WIZARD in Word 97 is simply a collection of AutoText entries.

## REPLACE SYMBOLS IN WORDPERFECT 6.1 AND LATER

YOU PROBABLY ALREADY know that WordPerfect permits you to use the *Insert•Symbol* command to "type" special characters (smiley faces, pointing hands, and so on) into documents. But what if you want to replace a symbol with another throughout a document?

Here's a simple way to avoid unnecessary manual input. You can also use this method to replace international charac-

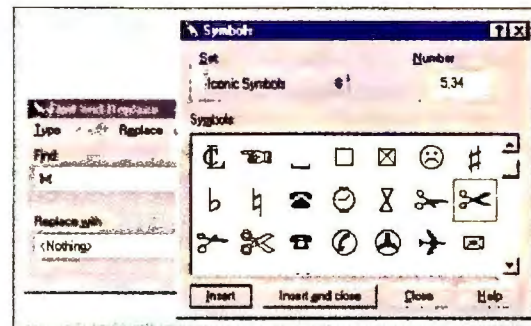


FIGURE 4: REPLACE SYMBOLS or international characters just as you would any text.

ters—say, if you want to replace *rèsumè* with *résumé* (see FIGURE 4).

1. In a document, select the symbol or character you want to change. Select *Edit•Find and Replace*.
2. When the *Find and Replace* dialog box opens, the selected character will appear in the *Find* field. Press **<Tab>**.
3. Press **<Ctrl>-W** to open the *Symbols* or *WordPerfect Characters* dialog box. Select a different character, and then select *Insert and Close*. This sequence inserts the replacement character in the 'Replace with' field.
4. Select *Replace* or *Replace All*, and you've finished the job.

**Hint:** You can use the same technique to insert special characters in any WordPerfect dialog box. For example, when you're working in WordPerfect's *Styles Editor* or *QuickCorrect* dialog box, just press **<Ctrl>-W**, and you'll get access to the entire set of symbols and characters available in WordPerfect.

Word Processing welcomes your questions and tips and pays \$50 for published items. PC World Contributing Editor George Campbell is a contributor to *The PC Bible* (Peachpit Press, 1995). See page 14 for contact information. ■

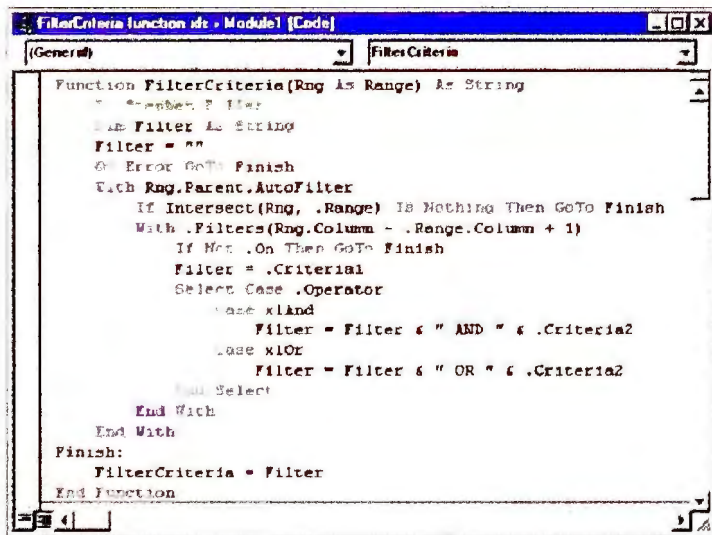
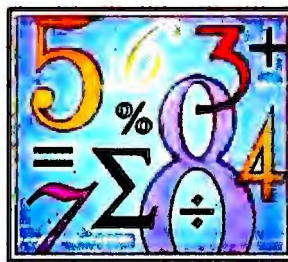


# Display AutoFilter Criteria in Excel

EXCEL'S AUTOFILTER feature, which you access by selecting *Data•Filter•AutoFilter*, gives you a fast and easy way to view rows that meet certain criteria. It works with a range of cells set up as a database. When AutoFilter is turned on, the row headers display drop-down arrows that let you specify criteria (such as "Age greater than 30"). Rows that don't meet your criteria are hidden—but are redisplayed when you turn off AutoFilter.

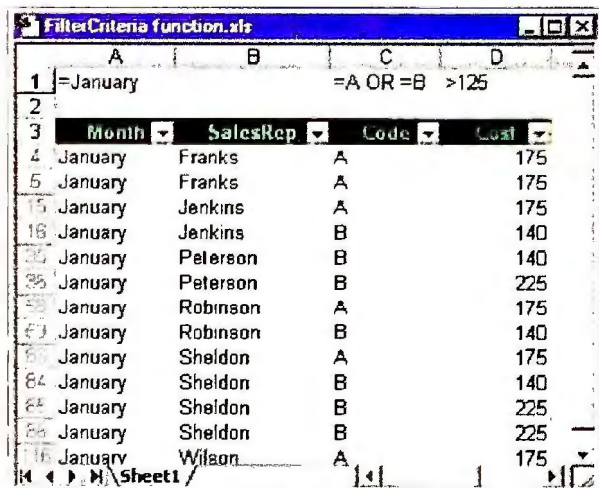
a cell's AutoFilter criteria (see **FIGURE 1**).

To create this function in Excel 97 or later, press **<Alt>-<F11>** to insert a new module for the active workbook. Then enter the code shown in Figure 1. In Excel 5 or 95, select *Insert•Module* and enter the code in the new module



**FIGURE 1: THIS IS THE VBA code for the FilterCriteria function. Use the function to display AutoFilter criteria.**

One problem is that Excel doesn't tell you which criteria are in effect. To overcome this deficiency, Stephen Bullen, a UK-based Excel guru, sent me a custom VBA worksheet function that displays



**FIGURE 2: FILTERCRITERIA displays the AutoFilter criteria currently in use (see row 1).**

sheet. Once you've entered the code, you can type in a formula such as **=FilterCriteria(A3)**. The single-cell argument for the FilterCriteria (in this example, A3) can refer to any cell within the column of interest. The formula will return the current AutoFilter criteria (if any) for the column of the cell specified in the FilterCriteria function.

**FIGURE 2** shows the FilterCriteria function in action. The cells in row 1 contain formulas that use FilterCriteria. As you can see, the list is currently filtered

to display a table in which column A contains the word *January*, column C contains a code of either *A* or *B*, and column D contains a value greater than 125 (column B is not filtered). The rows that don't match these three criteria are hidden.

## RANKING DATA IN EXCEL

EXCEL'S **RANK()** function returns the ranking of a particular number in a list of numbers. For example, you can use this function to generate a performance ranking of your sales staff or of your students on a test. The **Rank()** function is certainly useful, but when it yields a tie, the result may not be what you had in mind.

**FIGURE 3** shows three different ways to rank ties. Use the method most suitable for your needs. Column C displays the

## Alternate-Row Shading

ONE WAY TO MAKE your data legible is to apply cell shading to every other row in a range. In Excel 97 or later, select the range and choose *Format•Conditional Formatting*. In the Conditional Formatting dialog box, select *Formula Is* from the drop-down list, and enter this formula: **=MOD(ROW(),2)=0**. Click *Format*, select the *Patterns* tab, and specify a color for the shaded rows. Click *OK* twice and you're done! You'll find that the row shading persists even if you insert or delete rows within the original range.

rankings produced by the **Rank()** function, column D shows an alternative ranking method in which ties are ignored, and column E shows a method that assigns each tie value the middle rank.

There's no easy way to generate the rankings shown in Columns D and E. But I've developed a custom worksheet function called **AltRank()** that gives you extra flexibility for handling ties.

Ranking Methods				
	Score	Excel's RANK Function	Ignore Ties	Assign middle rank to ties
2	100	1	1	1
3	98	2	2	2.5
4	98	2	2	2.5
5	95	4	3	4
6	90	5	4	5
7	88	6	5	6
8	87	7	6	7
9	86	8	7	8
10	86	8	7	8
11	86	8	7	8
12	86	8	7	8
13	77	11	8	11
14	71	12	9	12

**FIGURE 3: COLUMNS C through E show three different ways to rank the data in column B.**

My **AltRank()** function is too lengthy to list or describe here, but if you download **Ranking.zip** from PC World Online's File-World ([www.fileworld.com/magazine](http://www.fileworld.com/magazine)), you'll get an Excel workbook with this function and instructions for using it.



Find files from this article at [www.fileworld.com/magazine](http://www.fileworld.com/magazine). Spreadsheets welcomes questions and tips and pays \$50 for published items. Contributing Editor John Walkenbach is the author of nearly two dozen books. Visit him on The Spreadsheet Page ([www.j-walk.com](http://www.j-walk.com)) or see page 14 for contact information.



# Gateway™ Business Computer Systems

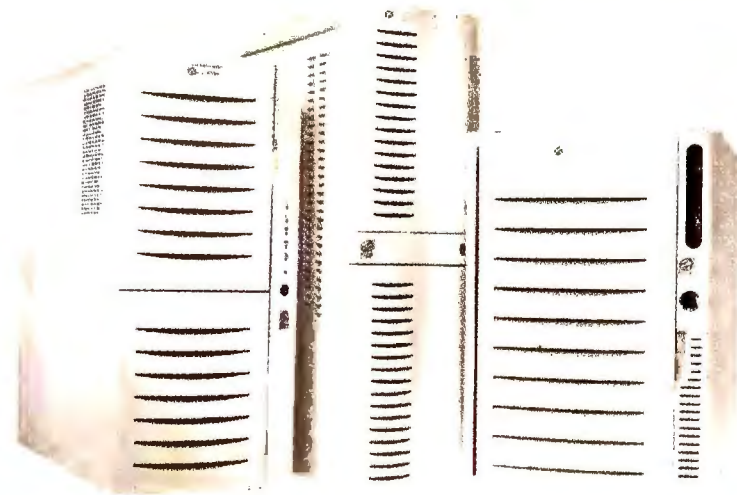




# Gateway™ ALR® Servers

## The Gateway ALR Series servers. Highly reliable, highly upgradable, highly affordable.

At Gateway, we have a full line of cutting-edge servers: from 2-way to 4-way. We custom-build them specifically for your company. Each is backed with Gateway 24/7 tech service and support online, by fax and phone. No matter what size company you have, we'll build a server just for you. **Gateway. Get more out of the box.™**



### ALR 7200 for workgroups

- Intel® Pentium® II Processor 350MHz with 512K Cache (supports up to Pentium II Processor 450MHz)
- Dual Processor Support
- 128MB PC 100 ECC SDRAM (expandable to 1GB)
- 4GB Ultra 2 SCSI Hard Drive (expandable to 27GB)
- Tower Case with 300W Power Supply
- InfoManager™ Server Management Software
- FCC Class A\*

Starting at **\$2399** or **\$66/month** for 48 mos. lease\*\*

### ALR 8300 for departments needing more speed

- Intel Pentium II Xeon™ Processor 450MHz with 512K Cache
- Dual Processor Support
- 128MB PC 100 ECC SDRAM (expandable to 1GB)
- 4GB Ultra 2 SCSI Hard Drive (expandable to 162GB)
- 13-Bay Tower Case with 400W Power Supply (optional Dual Redundant N+1 Power Supply Subsystem)
- InfoManager Server Management Software
- FCC Class A\*

Starting at **\$5199** or **\$134/month** for 48 mos. lease\*\*

### ALR 8200 for departments

- Intel Pentium II Processor 350MHz with 512K Cache (supports up to Pentium II Processor 450MHz)
- Dual Processor Support
- 128MB PC 100 ECC SDRAM (expandable to 1GB)
- 4GB Ultra 2 SCSI Hard Drive (expandable to 162GB)
- 13-Bay Tower Case with 400W Power Supply (optional Dual Redundant N+1 Power Supply Subsystem)
- InfoManager Server Management Software
- FCC Class A\*

Starting at **\$3699** or **\$102/month** for 48 mos. lease\*\*

### ALR 9200 for enterprise-sized companies

- Intel Pentium II Xeon™ Processor 400MHz with 512K Cache (expandable to 400MHz with 1MB Cache)
- Quad Processor Support
- 256MB ECC EDO DRAM (expandable to 4GB)
- 4GB Ultra 2 SCSI Hard Drive (expandable to 54GB)
- 10-Bay Tower Case with Dual 400W Hot Swap Power Supplies (optional Redundant N+1 Power Supply Subsystem)
- Gateway Server Management Software
- FCC Class A\*

Starting at **\$7999** or **\$206/month** for 48 mos. lease\*\*



#### Server add-ons:

- **Network Operating System (NOS) Software Support Upgrade** - Extends your original 30-day network operating system support agreement to a total of one year. **\$799** per year
- **EV500 15" Color Monitor (13.9" viewable)** - Optimized for image accuracy and sharpness, the EV500 features convenient up-front controls, up to 1280 X 1024 resolution and .28 screen pitch. **\$160**
- **APC® Smart-UPS® 1400 Uninterruptible Power Supply** - Uncompromising power management for small business networks. **\$699**

Ad Code #10048

GSA Schedule #GS-35F-4565G

**call 1-800-337-5310**  
**www.gateway.com**



# E-Series Managed Desktop PCs

## The ones you buy today will work with the ones you buy tomorrow.

Our commitment to stable platforms is all about consistency. Our E-Series desktops are reliable, easy to manage and backed by 24/7 tech support online, by fax or phone. Starting at \$1098. We'll custom-build them just for your company, and even preload your company's software. So whether you buy one or five hundred, you know exactly what you're getting.

No matter when you buy them. **Gateway. Get more out of the box.<sup>SM</sup>**



### E-1200 333C

- Intel® Celeron™ Processor 333MHz with 256K Full-Speed Cache
- 32MB SDRAM expandable to 256MB
- 3.2GB SMART II Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive
- EV500 15" Color Monitor (13.9" viewable)
- Integrated ATI RAGE™ IIC 4MB SDRAM AGP™ Graphics Accelerator
- Integrated Intel 10/100 Ethernet with Wake-up On LAN
- MS® Windows NT® 4.0
- Intel LANDesk® Client Manager v.3.3

**\$1098 or \$31/month for 48 mos. lease\*\***

### E-3200 350

- Intel Pentium® II Processor 350MHz with 512K ECC Cache
- 96MB SDRAM
- 6.4GB SMART II Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive
- EV700 15" Color Monitor (13.9" viewable)
- Integrated ATI RAGE PRO TURBO™ 4MB AGP Graphics Accelerator
- Integrated 3Com® 10/100 Ethernet with Wake-up On LAN
- MS Windows NT Workstation 4.0
- Intel LANDesk Client Manager v.3.3

**\$1498 or \$41/month for 48 mos. lease\*\***

### E-4200 450

- Intel Pentium II Processor 450MHz with 512K ECC Cache
- 128MB 100MHz SDRAM expandable to 384MB
- 10GB SMART II Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive\
- VX900 17" Color Monitor (15.9" viewable)
- ATI RAGE PRO TURBO 8MB 2X AGP Graphics Accelerator
- 3Com 10/100 Ethernet with Wake-up On LAN
- MS Windows NT 4.0

**\$2498 or \$69/month for 48 mos. lease\*\***



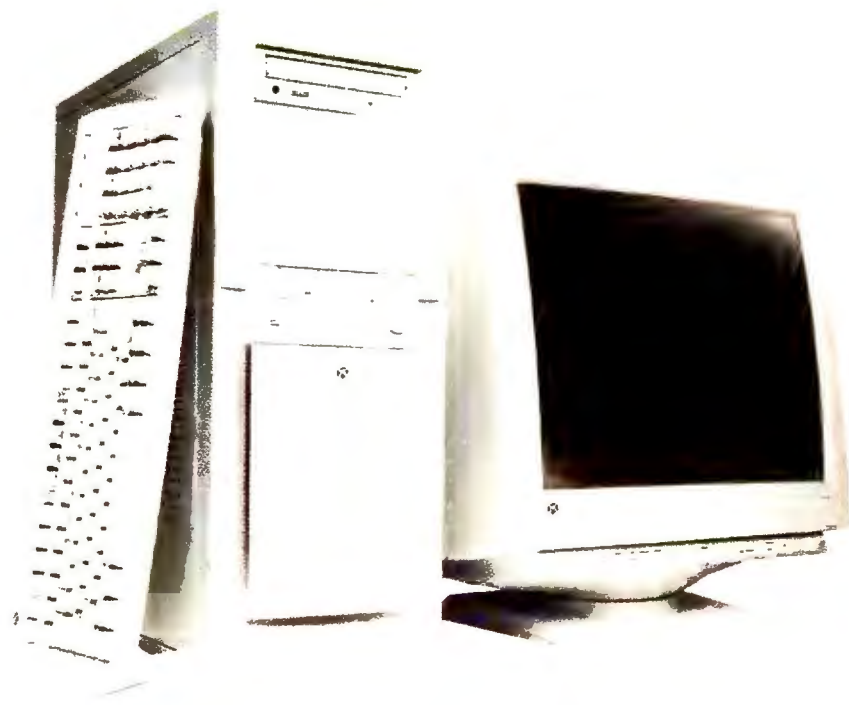
Call 1-800-GATEWAY or write to us at Gateway Terms & Conditions, P.O. Box 1951, North Sioux City, SD 57049-1951 for a free copy of our limited warranty, on-site service agreements, and installation agreements. If your Gateway technician determines an on-site visit is necessary, on-site service will be provided for products purchased and located in the continental United States, Alaska, Hawaii, Puerto Rico and Canada (excluding mice, keyboards, monitors and Solo portables). On-site and installation services are administered by PC Technology Services, Inc. See agreements for specific terms and limitations. \*FCC Class A products may not be sold for home use. \*\*Leasing provided by independent leasing companies to qualified commercial customers. Lease payments based on 48-month term. Lease terms subject to change without notice or obligation.



# E-Series Workstations

## Custom-built for your needs and for years of high performance.

These powerful workstations are designed for everything from software development to digital content creation, to computer-aided design, and we'll build them specifically for your needs. We'll also preload your company's software into them. So you'll have the tools to perform. Today and tomorrow. **Gateway. Get more out of the box.<sup>SM</sup>**



### E-5200 350

- Intel® Pentium® II Processor 350MHz with 512K ECC Cache (Dual Pentium II Processor Capable)
- 64MB ECC SDRAM
- 10GB SMART II UATA Hard Drive
- 13X min/32X max CD-ROM Drive
- VX900 19" Color Monitor (17.9" viewable)
- AccelGraphics™ Permedia® II with 8MB SGRAM
- 3Com® 10/100 Ethernet with Wake-up On LAN
- Microsoft® Windows® NT 4.0
- 3-Year Warranty\*

**\$1999 or \$55/month for 48 mos. lease\*\***

### E-5200 450

- Intel Pentium II Processor 450MHz with 512K ECC Cache (Dual Pentium II Processor capable)
- 128MB ECC SDRAM
- 9GB Ultra2 SCSI Hard Drive
- 13X min/32X max SCSI CD-ROM Drive
- VX900 19" Color Monitor (17.9" viewable)
- AccelGraphics Permedia II with 8MB SGRAM
- 3Com 10/100 Ethernet with Wake-up On LAN
- MS® Windows NT 4.0
- 3-Year Warranty\*

**\$3299 or \$91/month for 48 mos. lease\*\***

### E-5250 450

- Intel Pentium II Xeon Processor 450MHz with 512K Full-Speed Cache (Dual Pentium II Xeon™ Processor Capable)
- 256MB ECC SDRAM
- 9GB Ultra2 SCSI Hard Drive
- 13X min/32X max SCSI CD-ROM Drive
- VX1100 21" Color Monitor (19.9" viewable)
- AccelGraphics Permedia II with 8MB SGRAM
- 3Com 10/100 Ethernet with Wake-up On LAN
- MS Windows NT 4.0
- 3-Year Warranty\*

**\$4699 or \$130/month for 48 mos. lease\*\***



\*Call 1-800-GATEWAY or write to us at Gateway Terms & Conditions, P.O. Box 1951, North Sioux City, SD 57049-1951 for a free copy of our limited warranty, on-site service agreements, and installation agreements. If your Gateway technician determines an on-site visit is necessary, on-site service will be provided for products purchased and located in the continental United States, Alaska, Hawaii, Puerto Rico and Canada (excluding mice, keyboards, monitors and Solo portables). On-site and installation services are administered by PC Technology Services, Inc. See agreements for specific terms and limitations. \*\*Leasing provided by independent leasing companies to qualified commercial customers. Lease payments based on 48-month term. Lease terms subject to change without notice or obligation.



# GP-Series Small Business Desktop PCs

## A big solution for small businesses.

We understand that your technology requirements are unique. That's why we custom-build our powerful GP-Series desktops just for your firm. Network-ready. Backed by our 24/7 tech service and support online, by fax or phone. Custom-configured with cutting-edge technology. Loaded with MS® Office Small Business Edition. Plus, our GP-Series desktops start at \$1399. Proving that in business, you don't have to be big to be powerful. **Gateway. Get more out of the box.™**

### GP6-333C

- Intel® Celeron™ Processor 333MHz with 128K Cache
- 64MB SDRAM
- EV500 15" Color Monitor (13.9" viewable)
- 4MB AGP Graphics
- 6.4GB Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive
- Iomega® Internal ZIP® Drive
- 3.5" Diskette Drive
- SoundBlaster® AudioPCI™ 64V
- Altec Lansing® GCS-100 Speakers
- Mid-Tower Case
- 10/100 Ethernet Network Card
- 104+ Keyboard & Mouse
- Microsoft® Windows® 98
- MS® Office 97, Small Business Edition plus Bookshelf® 98
- Gateway Gold™ Service for G-Series PCs\*

**\$1399 or \$38/month for  
48 mos. lease\*\***

### GP6-400

- Intel Pentium® II Processor 400MHz with 512K Cache
- 64MB SDRAM
- EV700 17" Color Monitor (15.9" viewable)
- 16MB AGP Graphics
- 10GB Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive
- Iomega Internal ZIP Drive
- 3.5" Diskette Drive
- SoundBlaster AudioPCI 64V
- Altec Lansing GCS-100 Speakers
- Mid-Tower Case
- 10/100 Ethernet Network Card
- 104+ Keyboard & Mouse
- Microsoft Windows 98
- MS Office 97, Small Business Edition plus Bookshelf 98
- Gateway Gold Service for G-Series PCs\*

**\$1899 or \$52/month for  
48 mos. lease\*\***

### GP6-450

- Intel Pentium II Processor 450MHz with 512K Cache
- 128MB SDRAM
- VX900 19" Color Monitor (17.9" viewable)
- 16MB AGP Graphics
- 16GB Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive
- Iomega Internal ZIP Drive
- 3.5" Diskette Drive
- SoundBlaster AudioPCI 64V
- Altec Lansing GCS-100 Speakers
- Mid-Tower Case
- 10/100 Ethernet Network Card
- 104+ Keyboard & Mouse
- Microsoft Windows 98
- MS Office 97, Small Business Edition plus Bookshelf 98
- Gateway Gold Service for G-Series PCs\*

**\$2599 or \$71/month for  
48 mos. lease\*\***



**Gateway**™

### Small Business Software Values with system purchase

- **Microsoft® PowerPoint® Upgrade** - Create business presentations quickly and easily. Then prepare to sell that idea. **\$109**
- **QuickBooks®** - Just fill in checks, invoices and forms onscreen and QuickBooks does the accounting for you. Also includes customizable invoices and other professional business forms. **\$119**
- **QuickBooks Pro®** - The fastest, easiest way to manage your business. Includes all QuickBooks, multiuser capabilities, time tracking and more. **\$219**
- **Web Page Creator** - Make your business stand out from the rest. This set of Web page creation tools helps you design, post and manage your Web site. **\$129** (includes Adobe® PageMill® 3.0, Micrografx® Webtricity™ 2).
- **Business Graphics Pack** - Market your products and services more effectively - on paper and online with this comprehensive software bundle. **\$149** (includes Visio® Standard 5.0, Adobe Photo Deluxe® Business Edition, LiveArt™ 98, Simply 3D™).
- **Proven Edge™** - Accounting, contact management, day planner, word processing, mail merge, charts and graphs. Proven Edge™ Plus has everything you need to effectively manage people, time and money. **\$179**
- **CorelDRAW™ 8** - A powerful illustration and page layout program that provides a full range of drawing, editing and text tools. **\$199**

Ad Code #10048

GSA Schedule #GS-35F-4565G

**call 1-800-337-5310**  
**www.gateway.com**



# Gateway™ Solo® Portable PCs

## There are Gateway Solos to suit everyone in your business. No matter where they're going.

It seems no one is tied to a desk anymore. But no matter what your company's portable needs are, power, exceptional portability or excellent value, we'll custom-build Gateway Solo portables just for your needs. These are the powerful portables for every business on the go.

**Gateway. Get more out of the box.™**

### 2500SE

#### the affordable portable

- 12.1" SVGA TFT Color Display
- Intel® Pentium® Processor with MMX™ Technology 233MHz
- 32MB SDRAM (expandable to 288MB)
- 2MB 128-Bit Graphics Accelerator
- Integrated CD-ROM Drive
- Integrated 3.5" Diskette Drive
- 2GB Ultra ATA Hard Drive
- NiMH Battery
- Carrying Case
- V.90 Modem for Windows
- Microsoft® Windows® 95
- 3-Year Warranty\*

**\$1749 or \$48/month for 48 mos. lease\*\***

### 2500LS the more robust affordable portable

- 13.3" SVGA TFT Color Display
- Intel Pentium® II Processor 233MHz with 512K Cache
- 32MB SDRAM
- 2MB 128-Bit Graphics Accelerator
- Integrated CD-ROM Drive
- Integrated 3.5" Diskette Drive
- 4GB Ultra ATA Hard Drive
- Lithium Ion Battery
- Carrying Case
- V.90 Modem for Windows
- MS® Windows 95
- MS Office 97, Small Business Edition
- 3-Year Warranty\*

**\$2149 or \$60/month for 48 mos. lease\*\***

\$99 upgrade to Windows NT

### 5150LS

#### for on-the-go presentations

- 14.1" XGA TFT Color Display
- Intel Pentium II Processor 233MHz with 512K Cache
- 64MB SDRAM (expandable to 288MB)
- 2.5MB 256-Bit Graphics Accelerator
- Modular CD-ROM Drive
- Modular 3.5" Diskette Drive
- 4GB Ultra ATA Hard Drive
- Lithium Ion Battery
- Carrying Case
- V.90 Modem for Windows
- MS Windows 95
- MS Office 97, Small Business Edition
- 1-Year Warranty\*

**\$2399 or \$66/month for 48 mos. lease\*\***

\$99 upgrade to Windows NT®

### 9100LS

#### the powerful desktop replacement

- 14.1" XGA TFT Color Display
- Intel Pentium II Processor 300MHz with 512K Cache
- 64MB SDRAM (expandable to 384MB)
- 4MB SGRAM 3D Graphics Accelerator
- Modular Combination CD-ROM/3.5" Diskette Drive
- 6GB Ultra ATA Hard Drive
- Lithium Ion Battery
- Deluxe Leather Carrying Case
- V.90 Modem with Cellular
- Windows 95
- MS Office 97, Small Business Edition
- 1-Year Warranty\*

**\$3099 or \$86/month for 48 mos. lease\*\***

\$99 upgrade to Windows NT



Add-Ons: **Port Replicator** - Includes VGA port, (2) PS/2 ports, Serial port, Parallel port, and power connector. **\$99**

**Mini-Docking Station** - Includes RJ45 Ethernet 10/100, VGA port, (2) PS/2 ports, Serial port, Parallel port, Game port, audio connectors, power connector, and (2) 32-Bit CardBus PC Card slots. **\$199**

**Full Docking Station** - Includes integrated floppy drive, 2 Dual ISA/PCI Card slots, internal 3.5" bay, external 5.25" bay, (2) 32-Bit CardBus PC Card slots, NTSC In and Out ports, and USB. **\$599**



Ad Code #10048

GSA Schedule #GS-35F-4565G

**call 1-800-337-5310**  
**www.gateway.com**

© Gateway 2000, Inc. All rights reserved. Gateway, the Gateway stylized logo, Gateway Gold, Solo and the "Get more out of the box" slogan are trademarks or registered trademarks of Gateway 2000, Inc. The Intel Inside Logo, Intel, Pentium and Pentium II Xeon are registered trademarks, and MMX is a trademark of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. Not all Gateway systems contain the Pentium II processor. All prices and configurations are subject to change without notice or obligation. Prices do not include shipping and handling and any applicable taxes. \*Call 1-800-GATEWAY or write to us at Gateway Terms & Conditions, P.O. Box 1951, North Sioux City, SD 57049-1951 for a free copy of our limited warranty. On-site service and installation are not available for Solo portables. \*\*Leasing provided by independent leasing companies to qualified commercial customers. Lease payments based on 48-month term. Lease terms subject to change without notice or obligation.

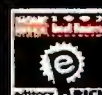
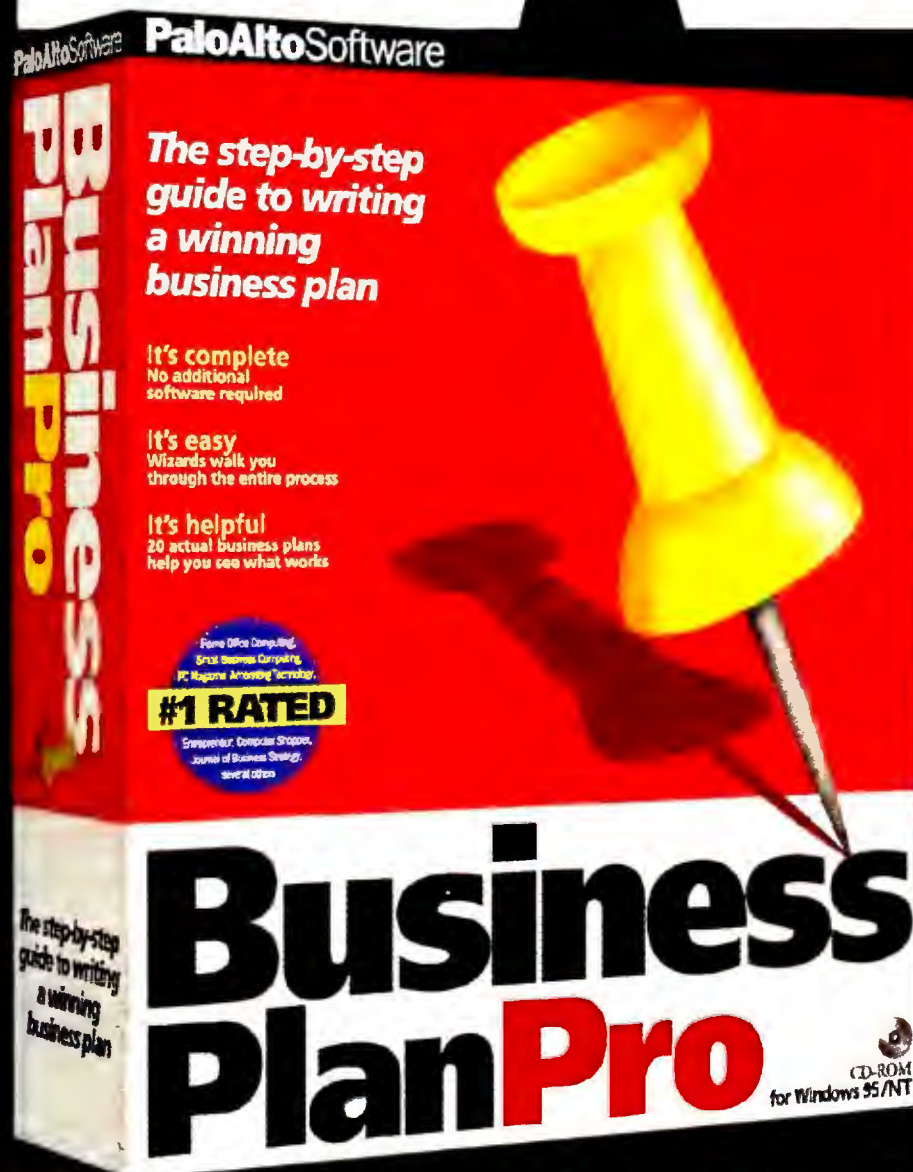


# PLAN

**PC**  
MAGAZINE

"No business plan software can match Business Plan Pro for its navigational ease, customizability and superb integration."

- **PC Magazine**



"It walks you through each step, tells you exactly what information is recommended for each section, and supplies plenty of helpful examples."

- **Home Office Computing**

# NOW

Please visit our website at  
**www.palo-alto.com**  
and download a free demo today.

**Easy, Helpful, Complete. Everything You Need to Plan Your Business Now.**

[www.palo-alto.com](http://www.palo-alto.com)

**Palo Alto Software**

1-800-229-7526

© 1998 Palo Alto Software, Inc.

Circle 225 on card or go to [www.pcworld.com/info1](http://www.pcworld.com/info1)



Play music ♦ Find your system's backdoor ♦ Bad sectors or lost clusters?

# Reset Your Forgotten System Password

FACE IT: COMPARED to Windows 9x's security features, the fold-lock top of a cereal box is impenetrable. Almost anyone can get past your log-on password just by hitting <Ctrl>-<Alt>-<Delete> to restart the PC and boot into DOS. Once there, a hacker can delete the PWL files in your Windows directory to disable password protection. For tighter security, you must rely on the CMOS password, which comes into play before Windows loads. CMOS (an acronym standing for *complementary metal oxide semiconductor*) is part of the firmware on your motherboard that holds your BIOS code and settings. Once you have enabled the password option in your CMOS setup program, your system will prompt you for the password at boot-up, before it gets to the operating system.

Because there are many different BIOS versions, I can't give you specific instructions. In general, you need to enter your PC's CMOS setup program by hitting the appropriate key at the beginning of your boot process. A screen prompt usually lets you know which key to press—often it's <Delete> or <F1>. When the CMOS setup screen appears, scan the menu choices for User Password or a similar entry (see **FIGURE 1**). When prompted, type in your password of choice. And be very careful not to mistype. Even if you're an excellent touch-typist, it won't hurt to look at the keyboard this time when you type the password. Warning: If you lose or forget this password, you won't be able to use your PC.

Okay, so what if you *do* forget or mistype your password? Unfortunately,

there's no quick workaround, but the first step is to try to find another password that works. Default passwords—also known as *backdoors*—can be added by the manufacturer of the BIOS, motherboard, or PC. In some cases, when you initially set up your password, the CMOS setup program may ignore what you have typed and instead activate a default password. In that event, call your PC manufacturer—or if need be, the makers of your motherboard and BIOS—and ask whether a default password exists. Also try these words: **AMI**, **AWARD SW**, **password**, and **cmos**. These passwords are often case sensitive, so you might try using all-capital and all-lowercase variants.

Failing that, many systems permit you to physically reset the CMOS contents from the motherboard. Check your computer's or your motherboard's manual for a jumper that can clear the current CMOS password. If the jumper is there, you can just set it and be back in business.

If your system lacks a password reset, you can still hack your way in by using a motherboard jumper to reset the entire contents of the CMOS program. Of course, this wipes out vital system information, including hard disk settings, power settings, and time and date. So write down your hard



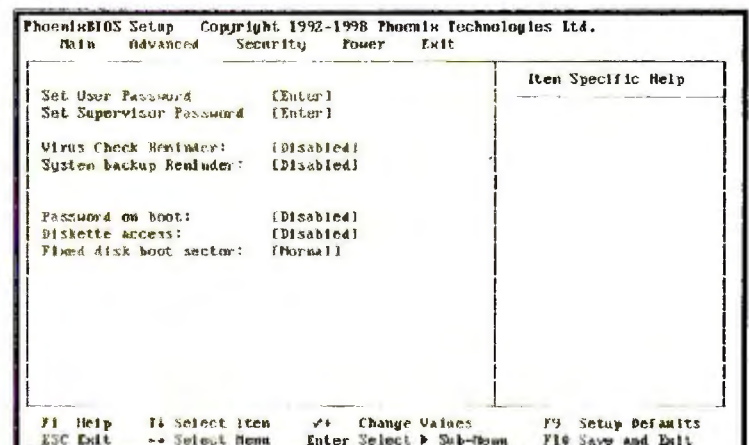
## Why Won't My CD Play?

HAVING TROUBLE getting audio CDs to play over your PC's speakers? When you play CDs on a CD-ROM drive, the signals bypass the digital pathways of your PC and travel directly from the CD-ROM drive to the sound card via a small wire and then out to the speakers. This wire can come loose, so make sure it's securely connected. Most CD-ROM drives include a headphone jack and volume knob. Even if your system doesn't have an audio patch wire installed, you can plug your headphones into the drive and listen away.

disk configuration and other key CMOS settings before refreshing the CMOS. Though most CMOS programs auto-detect the hard disk configuration, it won't hurt to have this information handy.

No reset jumper? You can erase the BIOS settings by removing the CMOS battery from the motherboard. The battery is typically a round, metallic unit that rests on the motherboard near the power connector; check your manual to make sure. If the battery is removable, pull it out and keep it out for several hours: It may take a while for the charge to drain out of the CMOS circuitry.

In many motherboards the CMOS battery is soldered down, but don't let that discourage you. If your motherboard has a connector for adding a second battery, you can set a jumper to disable the old battery, wait several hours for the CMOS to drain, and then connect the new battery. If no such connector is present, you'll have to take your PC into the shop to get the



**FIGURE 1: THE TEXT-BASED BIOS SETUP** (in this example, it's by Phoenix), lets you set a password for ironclad security.



CMOS battery replaced. Don't forget to tell the technician to let the CMOS settings clear before replacing the battery.

## HARD DISK DILEMMA



MY SYSTEM HAS been in the same spot on my desk since I bought it new a year ago. But yesterday I ran ScanDisk as part of my weekly maintenance and found a bunch of errors. Do I have bad sectors? How did this happen? Is it old age?

Nancy Bronto, El Paso, Texas

BAD SECTORS CAN be an indication that your hard disk is starting to break down, but that seems improbable here. A year-old hard disk usually isn't a candidate for the scrap heap. More likely, you're looking at residue left behind by Windows.

Windows 95 and Windows 98 maintain frequently used files in quickly accessible RAM rather than on the slower hard disk. That boosts performance, but it also means that key system files aren't safely ensconced on the disk when your system shuts down prematurely—after an application crash or a power outage, say. Be-

monitor the health of their hard disk data. To launch ScanDisk, click *Start•Programs•Accessories•System Tools•ScanDisk*. The program examines your hard disk's file structure and tests the physical surface of the disk for damaged sectors.

ScanDisk commonly reports three types of errors: lost clusters; invalid clusters and lost file fragments; and cross-linked clusters. Of these, lost clusters are the most frequently identified problem. Clusters are chunks of storage space on the hard disk where files are kept. Every file takes up at least one cluster, and the size of the cluster depends on the size of the disk partition and on the file system used. A 1GB drive formatted under FAT16, for example, employs relatively wasteful 32KB clusters (so even a 1KB file consumes 32KB of space). The same drive formatted under FAT32, however, uses clusters that are much smaller—4KB. Files larger than a single cluster are stored in groups of clusters known as *chains*.

ScanDisk's 'lost clusters' error message means that Windows' File Allocation Table has lost track of a cluster and doesn't know where it should go. The program lets you save lost clusters to a file or delete them. In most cases, you should just delete these wayward clusters and move on. Though you can attempt to salvage the lost data, doing so means spending a lot of time rebuilding files with a low-level editing utility like Norton's Diskedit—or turning to an expensive data recovery service.

An 'invalid cluster' or 'lost file fragment' error message indicates that a portion of a file has been separated from the rest of that file. Again, you can choose to delete the fragment or save it to a file if you're desperate.

Finally, the 'cross-linked clusters' message indicates that multiple files are sharing a single cluster. You can untangle cross-linked files by using the applications that created them to resave the affected files. Or you can have ScanDisk create rescue files that contain the original data, writing the results to .chk files in the root

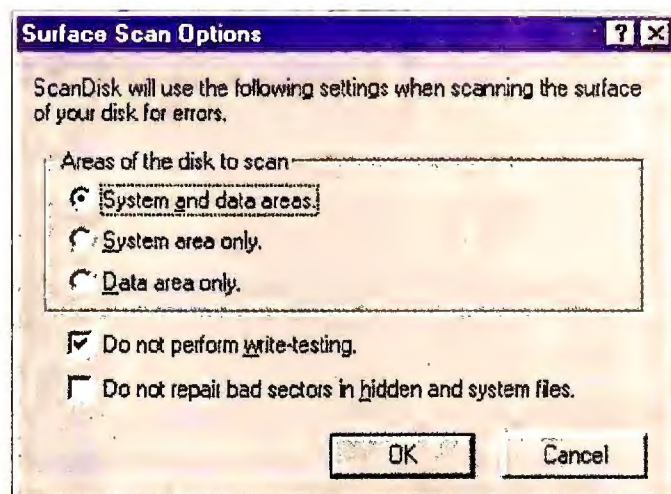


FIGURE 3: DISABLING WRITE TESTING will save time when ScanDisk scans the surface of large hard disks.

directory of your computer's C: drive.

Of course, physical damage to the disk is a serious problem. To prevent data loss, your system must recognize and mark damaged disk sectors so Windows won't write data to them. ScanDisk will do this work for you, but only if you instruct it to. Select the *Thorough* test option from the opening ScanDisk screen (see FIGURE 2), and the program will conduct a disk surface scan. Don't be surprised if running this test takes a long time, especially if you have a multiple-gigabyte disk peppered with FAT32's tiny 4KB clusters.

You can speed things up by clicking the Options menu item and checking *Do not perform write-testing* before you start (see FIGURE 3). This option limits testing to data reads only, letting you identify surface flaws while paring down the workload.

If you suspect that a hard disk crash is imminent, test your system area files. If ScanDisk finds errors in these sectors—where the master boot record, as well as other critical disk information, is stored—you have a real problem. The configuration data in these sectors can't be moved elsewhere on the disk, and if the data becomes corrupted, you may lose access to your hard disk. If physical errors turn up here, back up the disk immediately and consider replacing it right away.



For additional hardware tips, see [www.pcworld.com/heres\\_how](http://www.pcworld.com/heres_how). Kirk Steers is a PC World contributing editor. We welcome your tips and questions and pay \$50 for published items. See page 14 for contact information.

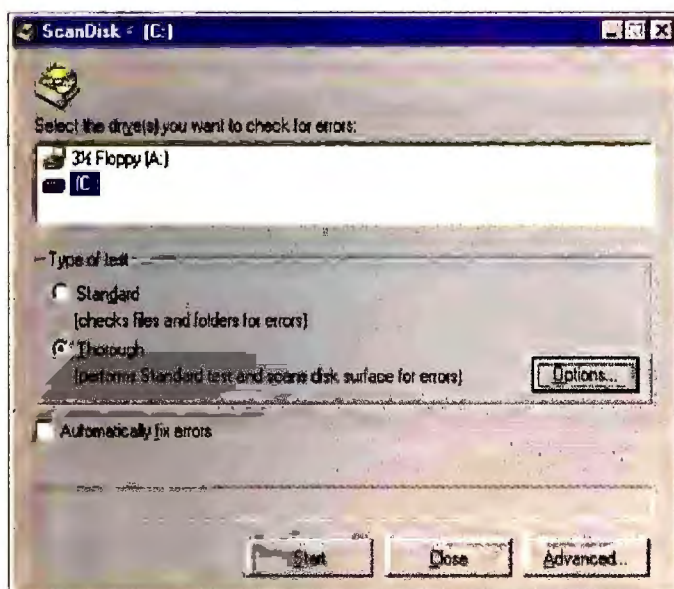


FIGURE 2: SELECT SCANDISK'S THOROUGH option to test the physical integrity of the hard disk's surface.

cause Windows doesn't have a chance to write those cached files back to disk, you can end up with orphaned file fragments, lost clusters, and other nuisances. The bad sectors ScanDisk encountered may be the result of unexpected shutdowns.

Windows 95 OSR2 and Windows 98 address this problem by running ScanDisk when the PC boots up following a crash. But all Windows users should also run ScanDisk on their own periodically to



# Move Up to Windows NT 4.0

IS YOUR PC an essential part of your job? Do you use it for more than Web surfing and occasional word processing? Are you having stability problems with Windows 95 or 98? If the answer to these questions is yes, then it may be

time to consider moving to NT Workstation 4.0, which is a more solid platform. And it looks and works like Windows 9x.

Yes, the next incarnation of NT—Windows 2000—is expected to be available sometime this year, but if you've made up your mind that you need to upgrade, don't wait; go with NT Workstation 4.0 now. With the arrival of the Service Pack 4 update and bug fix, most of NT 4.0's

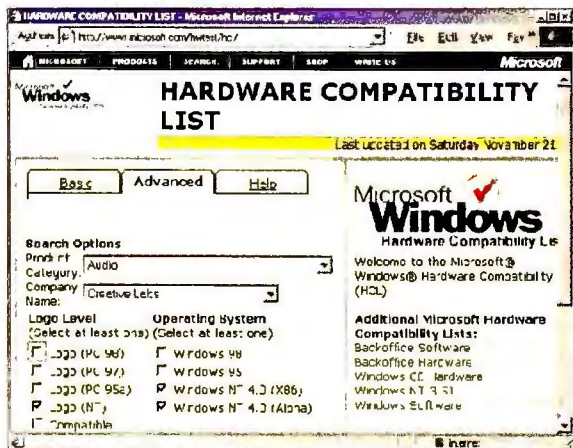
problems seem to be ironed out. And you'll run into fewer unexplained crashes than with Windows 9x. NT's design also ensures that one buggy application won't crash your entire system, meaning fewer reboots and assured, constant operation.

But naturally, there are caveats. For one, Windows NT Workstation retails in the \$275 range, while Win 98 costs about \$100. Win NT also lacks Plug and Play,

**1 Be prepared.** Installing NT requires a few more initial steps than when installing 9x. Most peripherals that require drivers include versions for NT 4.0, but chances are the ones you have are old. Your best bet is to download the latest drivers from the manufacturers' Web sites. Make sure you get all the drivers downloaded and copied to floppy disks before you start the upgrade. If any of your peripherals lack NT driver support, you'll have to consider a hardware upgrade (see step 5).

You can find out if your hardware is supported under NT by perusing the interactive Hardware Compatibility List on Microsoft's Web site ([www.microsoft.com/hwtest/hcl](http://www.microsoft.com/hwtest/hcl)), as shown below. This list will let you know if your hardware will work under NT and will even point you to the latest Microsoft-certified drivers. If you don't have Internet access, the NT 4.0 installation CD-ROM includes a device list, though it will be somewhat out of date.

Of course, you need to back up all your data and applications. It's also a good idea to test the backup media afterward, to make sure the data you've written is readable.



**2 Start the installation.** Three floppy disks come with NT. Insert Setup Disk 1 into your floppy drive and start your PC. Be patient as NT loads a bunch of files. Depending on your PC, you may be asked to insert one or both of the other floppies.

Eventually, you'll see the welcome screen. Note the "R" option, which lets you restart the installation if something unexpected happens. Other screens, including the obligatory license agreement, also appear.



**3 Choose partition, file system, and directory.** When you see a screen that shows the partitions on your PC's hard drives, read the instructions very carefully. The first partition is always highlighted. *Don't* press D, because that will erase everything on your disk. If you're setting up a dual-boot system, you can press <Enter> to use the existing partition. You can also set up NT on a second partition, in which case you can make use of the NT File System. NTFS will let you gain access to NT-specific features such as on-the-fly file compression and security, but only when you are running NT.



The next screen provides your file system options. By default, the 'Leave the current file system intact (no changes)' choice is highlighted. For dual booting, you'll get best compatibility with this option. If you intend to dual-boot and want to go with the 'Convert the partition to NTFS' option, make sure you install NT into a different partition from Windows 9x. Otherwise, Windows 9x won't run at all. (For more on dual-booting and file system issues, see this month's *Windows NT* column on page 236.)

In general, you should install NT to the default directory \WINNT if you want to dual-boot. Installing to the existing \WINDOWS directory will wipe out your 9x files. Unlike Windows 9x, however, NT doesn't limit you to installing the operating system on your C: drive.

At this point, you'll be prompted to enter an administrator name and password. Write them down—you'll need them to gain access to your NT system. Eventually, you'll be asked to remove the floppy disk and reboot your system.



USB support, and power management features. Finally, NT uses considerably more hardware resources than Windows 9x—older Pentium systems will run noticeably slower under NT than under 9x. Still, a 200-MHz Pentium MMX with 64MB of RAM will run quite nicely, putting NT within reach of many users.

Most 32-bit Windows applications work better under NT than they do under Windows 9x. Exceptions include some system utilities, virus checkers, and gaming software. Check your software for NT compatibility before you forge onward. If you still run DOS apps, stick with Win 9x—it

works better with older, 16-bit software.

For best results, you should install Windows NT “clean,” on a freshly formatted hard disk. If you aren’t ready to give up on 9x entirely, you can install NT so that it runs side-by-side with 9x, under a dual-boot configuration. When your PC starts, you will see a text menu that lets you choose which operating system to run. Be aware that you must also reinstall your applications under NT.

Installing NT is more challenging than installing 9x. Because NT lacks Plug and Play, it won’t automatically recognize and configure devices. You must input device

configurations yourself after the initial setup is complete. And connecting to a network or Internet account requires some technical background. Carefully review the extensive setup information that comes with NT. If you feel overwhelmed, call your local computer dealer or a knowledgeable friend for help.

Below is an overview of the NT Workstation setup. See also this month’s *Windows NT* column on page 236.

*Stan Miastkowski is a PC World contributing editor. See page 14 for contact information.*

**4 Follow the setup screens.** From this point on, installing NT is similar to installing Windows 9x, although with a few crucial differences. Read each screen carefully—you’ll see a lot of them.

If your NT system will be connected to a network, you’ll need to watch your step. NT Setup can automatically detect your network card and let you choose from a list, or install a driver from a floppy disk (if one came with your network card). In any case, planning is critical. Your network hardware must be configured and working before you can proceed.

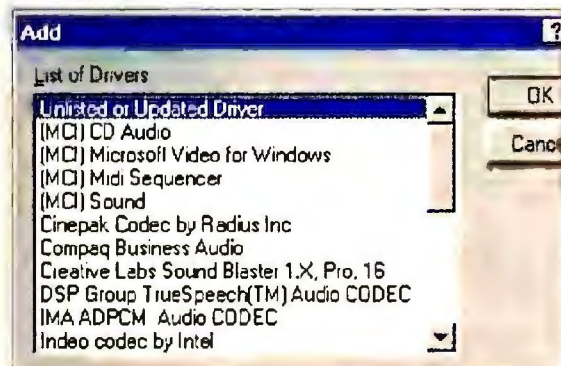
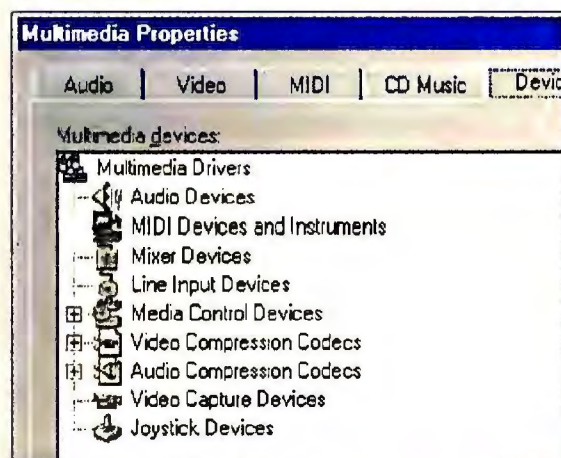
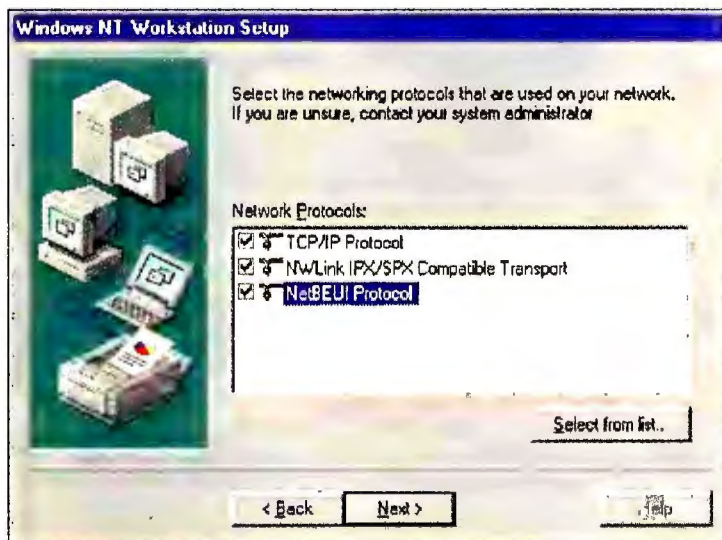
You’ll also need to choose and install protocols for networking. TCP/IP is used for the Internet, while NetBEUI is best for connecting to Windows PCs on a local area network (although you can

use TCP/IP for this as well). If you have NetWare servers on your LAN, consider the IPX/SPX protocol. Many other network protocols are available, so review your NT documentation to ensure you have all the information you need to set up your network connection. Work closely

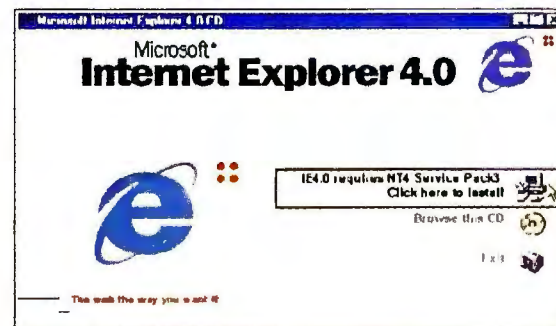
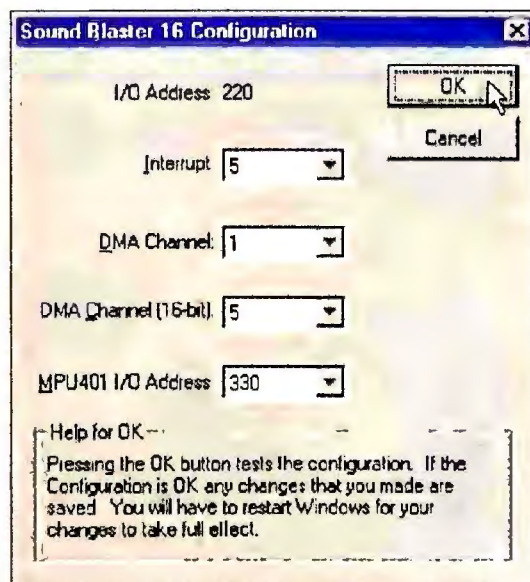
with your system or network administrator, if you have one.

The final steps allow you choose a time zone, create an emergency repair disk (a crucial task), and copy required files. Eventually, you’ll be asked to restart your PC.

Unlike with Windows 9x, you need to press <Ctrl>-<Alt>-<Delete> to log on to NT, and enter the password you chose during setup. Once you’ve logged on to the system, the desktop will look almost identical to Windows 9x.



**5 Install drivers.** The next step is to install drivers for components such as your graphics card and sound card. Check the documentation that came with your components for NT instructions. If no such instructions exist, you can install most components by selecting *Start•Settings•Control Panel* and then selecting the associated icons, such as Multimedia, Display, or Modem.



**6 Install the latest service pack.** See if your version of NT 4.0 includes Service Pack 4, with updates and bug fixes needed for a solid system (as shown above, it may have SP3 instead). If it doesn’t, download SP4 from [www.microsoft.com/windows/downloads/contents/updates/nt4svc4](http://www.microsoft.com/windows/downloads/contents/updates/nt4svc4), and follow the install instructions.



# PC Mall

The Mall With It All...For Less!

# We Will Beat

We will beat any price on any computer, from any authorized catalog reseller. We want your business.

## TOSHIBA

### Satellite 4000CDS

#### Affordable Multimedia!

- 233MHz Pentium II processor w/MMX™ technology
- 32MB RAM
- 4.1GB HD
- 24X CD-ROM
- 12.1" Dual Scan
- 56Kbps modem

**Price Drop**  
**\$1,549**  
#34755

Order#	Model	Pentium® processor*	RAM	HD	CD	Display	Modem	Price
--------	-------	---------------------	-----	----	----	---------	-------	-------

#### Tecra Series

#34763	8000	233 PII MMX	32	4GB	24X	12.1" TFT	56K	\$2,449*
#34767	8000T	266 PII MMX	64	6GB	24X	13.3" TFT	56K	\$2,999*
#30978	7800CD	266 PII MMX	64	5.1GB	20X	13.3" TFT	56K	\$2,659
#30976	7800DVD	233 PII MMX	64	5.1GB DVD	13.3" TFT	56K		\$3,049

#### Portege Series

#34810	7000CT	266 PII MMX	32	4.3GB	—	12.1" TFT	56K	\$2,929
#39052	3010CT	266 MMX	32	4.3GB	—	10.4" TFT	56K	\$1,999

#### Satellite Series

#34755	4000CDS	233 PII MMX	32	4.1GB	24X	12.1" DSTN	56K	\$1,549
#34758	4000CDT	233 PII MMX	32	4.1GB	24X	12.1" TFT	56K	\$1,749
#37253	4010CDS	266 PII MMX	32	4.1GB	24X	12.1" DSTN	56K	\$1,759
#37260	4010CDT	266 PII MMX	32	4.1GB	24X	12.1" TFT	56K	\$2,049
#37261	4020CDT	300 PII MMX	64	6.4GB	24X	13.3" TFT	56K	\$2,899

#### Libretto

#39002	110CT	233 MMX	32	4.3GB	—	7.1" TFT	—	\$1,799
--------	-------	---------	----	-------	---	----------	---	---------

\*Windows 98

## UMAX

### StationBook 318T

- AMD K6-2/300 processor
- 48MB RAM
- 3.2GB HD
- 12.1" TFT Display
- 56K Modem
- 24X CD-ROM
- Windows® 98

**only**  
**\$1,499**  
#38359

## IBM

### ThinkPad 390XD

- 233MHz Pentium® processor w/MMX™ technology
- 32MB
- 3.2GB HD
- 24X CD-ROM
- 12.1" TFT display
- 56Kbps Modem

**only**  
**\$1,649**  
#37649

Order#	Model	Pentium® processor*	RAM	HD	CD	Display	Modem	Price
--------	-------	---------------------	-----	----	----	---------	-------	-------

#35175	TP380Z	233 PII MMX*	32	4.0GB	24X	12.1" HPA	—	\$2,199
#35180	TP380Z	300 PII MMX*	32	4.0GB	24X	12.1" HPA	—	\$2,689

#### ThinkPad 560

#35329	TP560X	233 PII MMX*	32	4GB	—	12.1" TFT	56K	\$2,499*
#35338	TP560X	300 PII MMX*	64	6.4GB	—	12.1" TFT	56K	\$3,369*

#### ThinkPad 600

#35187	TP600	266 PII	64	5.1GB	24X	13.3" TFT	56K	\$4,139
#35193	TP600	266 PII	64	6.0GB	OVO	13.3" TFT	56K	\$4,399

#### ThinkPad 770

#30325	TP770E	266 PII	32	5.1GB	—	14.1" TFT	33.6K	\$3,759
#30327	TP770EO	266 PII	64	8.1GB	OVO	14.1" TFT	56K	\$4,809

#### ThinkPad 390

#38160	TP390	233 PII	32	3.2GB	24X	14.1" TFT	56K	\$1,899*
#38171	TP390	266 PII	64	4.3GB	24X	14.1" TFT	56K	\$2,849*

\*Windows 98 †Windows NT

## FUJITSU

### LifeBook E330



- 233MHz Pentium II processor w/MMX™ technology
- 32MB RAM
- 3.2GB hard drive
- 24X CD-ROM drive
- 12.1" TFT
- Win 95
- 56K fax/data modem

**\$1,599**  
#36034

#36034	E330	233 PII MMX	32	3.2GB	24X	12.1" TFT	56K	W95 \$1,599
#36036	E335	233 PII MMX	32	3.2GB	24X	13.3" TFT	56K	W95 \$1,999
#36038	E340	266 PII MMX	32	4.0GB	24X	13.3" TFT	56K	W95 \$2,399
#36044	E350	300 PII MMX	32	5.0GB	24X	13.3" TFT	56K	W95 \$2,699

## COMPAQ

### Prosignia SMB

- 233 - 300MHz Pentium processor w/MMX Technology
- 32 exp to 160MB RAM
- 3.2 to 6.0GB HD
- 24X CD
- 12.1-14.1 TFT
- 56Kbps Modem
- MS Office 97 SBE V2

**Starting at**  
**\$2019**  
#38829

Compaq Hotline  
Call (888)932-2493 or  
[www.pcmall.com/compaqstore](http://www.pcmall.com/compaqstore)

MS Office 97  
SBE V2  
Included!

Order#	Model	Processor*	RAM	HD	CD	Display	Modem	Price
--------	-------	------------	-----	----	----	---------	-------	-------

#### Prosignia SMB

#38829	120	233 PII MMX	32	3.2GB	24X	12.1" TFT	56K	\$2,019
#38854	140	266 PII MMX	32	4GB	24X	13.3" TFT	56K	\$2,499
#38855	160	300 PII MMX	32	6GB	24X	14.1" TFT	56K	\$2,999

#### Armada 1700 Series

#33230	1700	233 PII MMX	32	4.0GB	24X	12.1" TFT	56K	\$2,299
#33235	1700	266 PII MMX	32	4.0GB	24X	13.3" TFT	56K	\$2,799
#35391	1700	300 PII MMX	32	5.0GB	24X	14.1" TFT	56K	\$3,499

#### New Armada 7800 Series

#31072	7800	266 PII MMX	64	5.0GB	20X	13.3" TFT	33.6K	\$3,699
#31073	7800	266 PII MMX	64	5.0GB	20X	13.3" TFT	—	\$3,299

#### Armada 3500 Series

#35380	3500	266 PII MMX	32	4.1GB	—	12.1" TFT	—	\$2,769*
#35381	3500	300 PII MMX	64	6.4GB	—	13.3" TFT	—	\$3,659

## COMPAQ

### Presario 1235



**\$1,399\***  
#36011

- 266MHz AMD-K6 w/MMX™ technology
- 32MB RAM
- 12.1" HPA Display
- 4GB HD
- 56Kbps Modem
- 24X CD-ROM

Order#	Model	processor*	RAM	HD	CD	Display	Modem	Price
#40901	1255	333 AMD-K6-2	32	4.0GB	24X	12.1" TFT	56K	\$1,499
#40904	1260	333 AMD-K6-2	64	4.0GB	24X	12.1" TFT	56K	\$1,799
#36007	1240	266 AMD-K6-2	64	4.0GB	24X	12.1" TFT	56K	\$1,699
#32563	1655	266 PII	64	4.0GB	24X	13.3" TFT	56K	\$2,199
#36014	1810	300 PII	64	6.4GB	DVD-2	13.3" TFT	56K	\$2,799

\*\$100 mail-in rebate from Compaq upon sign-up for 50-hour free trial of Compaq Easy Internet Access

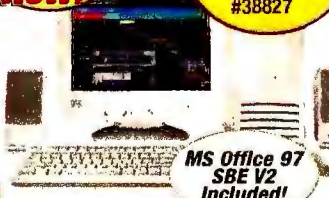
## COMPAQ

### Prosignia SMB

- 333MHz Celeron Processor w/MMX technology or 350 to 450MHz Pentium II Processor w/ MMX technology
- 32 to 64MB exp. to 384MB (256MB on Celeron model)
- 8.4 to 10GB Ultra ATA hard drive
- 40X or DVD - ROM
- Includes: MS Office 97 SMB, Compaq Online services, Norton AntiVirus 4.0, MS Internet Explorer 4.01
- 56K Modem

**starting at**  
**\$1,169**  
#38827

**New!**



MS Office 97  
SBE V2  
Included!

Compaq Hotline  
Call (888)932-2493 or  
[www.pcmall.com/compaqstore](http://www.pcmall.com/compaqstore)

#### Prosignia SMB Desktops

Order#	Model	Processor	RAM	HD	CD	Form	System	Price
#38827	310	333 Celeron MMX	32	8.4GB	40X	T/D	Win98	\$1,169
#38845	330	350 PII MMX	64	10GB	40X	T/D	Win98	\$1,419
#38848	330	450 PII MMX	64	10GB	DVD	T/D	Win98	\$1,719

#### Desktop EP Series

#36311	4300	333 Celeron MMX	32	4.3GB	—	T/D	Win95	\$739
#36293	4300	300 Celeron MMX	32	4.3GB	—	T/D	Win95	\$729
#36312	6400CDS	333 Celeron MMX	64	6.4GB	32X	T/D	Win95	\$1,029
#36296	4300	350 PII MMX	64	4.3GB	—	T/D	Win95	\$1,149
#36314	10000CDS	400 PII MMX	64	10.0GB	32X	T/D	Win95	\$1,569
#36315	10000CDS	450 PII MMX	64	10.0GB	32X	T/D	Win95	\$1,699

T/D=towerable design

## COMPAQ

### Presario 2286

#### 333MHz Media GX II Processor w/MMX™ Technology

- 32MB RAM
- 32X CD
- 4GB hard drive
- 56Kbps modem

**only**  
**\$599**  
#40889

Monitor sold separately.



Order#	Model	Processor	RAM	HD	CD	Modem	Form	System	Price
#40891	5204	350 AMD-K6-2	64MB	4.0GB	32X	56K	MT	Win 98	\$799
#40893	5220	380 AMD-K6-2	64MB	8.0GB	32X	56K	MT	Win 98	\$999
#40894	5240	400 AMD-K6-2	64MB	10GB	40X	56K	MT	Win 98	\$1,199
#37441	5190	400 AMD-K6-2	128MB	12GB	DVD	56K	MT	Win 98	\$1,399*
#40895	5630	450 PII MMX	128MB	19GB	DVD	ADSL	MT	Win 98	\$2,199

37441 includes an Iomega Zip drive.

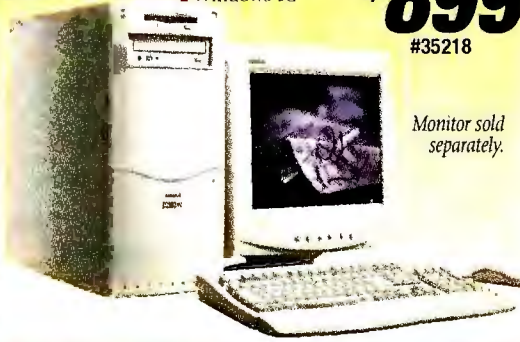
\*Price reflects \$100 mail-in rebate when you purchase an eligible Presario and sign up for a 50-hour free trial of Compaq easy Internet Access. †includes SuperDisk

#### UMAX PII 300MHz Processor w/MMX Technology

- 64MB RAM expandable to 384MB
- 8MB SGRAM
- 6.4GB Hard Drive
- 36X CD ROM
- 56K Modem
- Windows 98

**only**  
**\$899**  
#35218

Monitor sold separately.



#37498 AMD K6-2/350 64 6.4GB 36X 8MB 56K W98 \$899

#### Memory Prices Slashed!

**16MB only \$45.99** #65416  
**32MB only \$89.99** #65417  
**FREE UP! Screensaver with any memory purchase!**  
CD Win. Add Item # 73935.  
\$1.99 S&H fee applies.  
Shipped in promotional packaging.

## IBM

### Networking Solutions Designed for Your Business

#### IBM PC 300GL

- 350-450MHz Pentium II processor w/MMX™ technology or 300 to 333MHz Celeron processor
- 32 to 64MB RAM
- 3.2 to 6.4GB hard drive
- 512KB L2 cache (128KB on Celeron models)

**starting at**  
**\$849**  
#36588



Monitor sold separately.

Order#	Model	Processor	RAM	HD	CD	OS	Price
#36588	627512U	300 Celeron	32MB	3.2GB	—	W98	\$849
#36601	627522U	333 Celeron	32MB	3.2GB	—	W98	\$879
#36604	627525U	333 Celeron	32MB	3.2GB	32X	W98	\$1,049
#36607	628513U	333 Celeron	32MB	3.2GB	—	W98	\$899
#36590	627557U	350 PII	32MB	3.2GB	—	W98	\$1,049
#36612	627575U	450 PII	64MB	6.4GB	32X	NT	\$1,649
#36613	627574U	450 PII	64MB	6.4GB	—	NT	\$1,549
#33327	627555U	350 PII	32MB	3.2GB	—	NT	\$1,099
#33328	627556U	350 PII	64MB	3.2GB	—	NT	\$1,149
#33329	627566U	400 PII	64MB	6.4GB	—	NT	\$1,299

†Mini-tower

## 3Com

### Palm III™ Organizer

- 2MB, backlit screen
- Flash Memory
- Infrared beaming

Limited Time Only!



## Palm III

**\$299.99** #32548 Mac  
#29985 PC  
**only**

#8814



# Any Price!

Call us... and we'll give you the best price anywhere!



PC Mall is your  
"Best Place to  
Buy Multimedia  
Products"

# 3 for FREE

w/any purchase from PC Mall!



Inoculan  
AntiVirus 5.0  
Ask for item  
#31486  
(1" S&H)

Surge  
Protector  
Ask for item  
#38158  
(2" S&H)



A-10 Cuba  
& IF 22:  
Flight simulation  
games. Ask for  
item #31744  
(2" S&H)

All products  
shipped in  
promotional  
packaging

**Order & Register to WIN!**  
Win a 1999 Porsche Boxster.  
Register @ [www.pcmall.com/boxster](http://www.pcmall.com/boxster)



## Color Printers

**HP DeskJet 697C Printer**  
The printer with snap-in photo quality  
5ppm black; 1.7ppm color  
600dpi black, 600 x 300dpi color  
Optional snap-in photo-quality  
cartridge  
only **\$149.99** #36109

**38511 NEW HP DeskJet 420C Printer** - Full color printing at a great price! **\$119.99**  
**36106 NEW HP DeskJet 712C Printer** PhotoREt II, 6ppm black, 3 ppm color **\$199.99**  
**74696 HP DeskJet 340 Portable Printer** up to 3ppm, FREE Color Kit **\$269.99**  
**14434 HP DeskJet 722C Printer**, up to 8ppm black, 4ppm color **\$279.99**  
**37240 HP DeskJet 895Cse HP PhotoREt II**, 10ppm black, 6ppm color **NEW! \$399.99**  
**14717 HP OfficeJet 600** print, copy and scan in color, plain-paper fax **\$399.99**  
**33935 HP POfficeJet 710** Color printer, color scanner, color fax and copier **\$499.99**

\*Purchase select HP printers with ANY PC and Display and get a \$50 mail-in rebate! Qualifying products include: DeskJet 697C, 712C, 722C, 895Cse. OfficeJet 600, 600, 700 Series. Limit one per household. Valid 10/20/98 - 1/31/99. Ask for coupon #37154

## Hot New Printers!

**34768 Stylus Color 440 Printer** - 720 x 720dpi, 4ppm black, 2.5ppm color **\$149.99**  
**34783 NEW Stylus Color 640 Printer** 1440 x 720dpi, 5ppm black, 3.5ppm color **\$199.99**  
**30225 Stylus Color 800** 1440 x 720dpi, 8ppm black, 7ppm color **\$249.99**  
**34786 NEW Stylus Color 740 Printer** USB, serial & parallel interface **\$279.99**  
**30973 Stylus Photo 700 Printer** 1440 x 720dpi, 6-color printing **\$249.99**

## Laser Printers

**HP LaserJet 1100se Printer**  
600dpi resolution and microfine toner  
Up to 8ppm print speed  
2MB standard, expandable to 18MB  
Network capable w/optional  
print server 1 year warranty  
only **\$399.99** #37242

**38020 HP LaserJet 1100Ase Printer/Copier/Scanner** **NEW! \$499.99**  
**28438 HP LaserJet 3100se All-in-one Laser Printer/Fax/Copier/Scanner** **\$699.99**  
**34579 HP LaserJet 6Pse** 600dpi, up to 8ppm, w/FREE Companion se **\$799.99**  
**22660 HP LaserJet 4000se** 1200dpi, 17ppm 4MB, 100MB max **\$1,149.99**  
**32161 HP LaserJet 4000N** 12MB, Ethernet network-ready **\$1,438.99**  
**28432 HP LaserJet 5000** 11" x 17", 1200dpi, 16ppm, 4MB, 1000MR max **\$1,449.99**

Get a \$50 reward when using your Visa card to Purchase these printers Call for details.

## CD-ROM/CD-RW/DVD-ROM/RAM Drives

**16X Internal EIDE CD-ROM Drive** only **\$29.99** #30533  
**32912 Affinity 24X Internal IDE CD-ROM Drive** **\$34.99**

## New! HP CD-Writer 8110i Internal

only **\$399.99** #37483  
4X/24X CD-R ■ 2X/8X CD-RW  
Includes HP Disaster Recovery  
Internal EIDE (ATAPI)  
FREE\* 10-pack for CD-R with purchase after rebate  
**31656 Philips CD-RW Drive 2X/6X/2X Internal EIDE** **\$289.99**  
**37173 Sony Spressa 4x, 2x, 24x Internal IDE CD-RW Drive** **\$369.99**

## PC-DVD ENCORE

**DVD-ROM 2X/20X KIT** **\$219.99**  
2X DVD-ROM, 20X CD-ROM speeds  
Includes decoder card for MPEG2 & Dolby Digital **#24209**  
Supports all CD-ROM and DVD-ROM formats

## 56K Speed under \$30

**Desktalk 56K Internal Speakerphone Modem**  
Free upgrade to V.90 via web  
56Kbps x2 technology  
Telephone answering capabilities  
Full duplex speakerphone  
5 year warranty  
only **\$29.99\*** #31328  
Price reflects \$20 mail-in rebate

## Digital Cameras

**DC 260 True Mega Pixel Digital Zoom Camera**  
1536 x 1024 resolution ■ 8MB Std. + 8MB FREE!  
3X optical plus 2X digital zoom  
only **\$899.99** #39363  
FREE 8MB CompactFlash!

## Monitor Blowout

**Samtron 7E 17" Color Monitor** only **\$199.99** #30626  
15.8" viewable image  
1280 x 1024  
maximum resolution  
2.8mm dot pitch  
2 year warranty  
When you purchase any computer from PC Mall. While supplies last.

**FREE! Asound 90W Speakers w/any Monitor Purchase**  
\$4.99 S&H fee applies.  
Ask for item #33790.

SONY				
#23949	CPD-100ES	15 1/4"	1280 x 1024	0.25mm <b>\$199.99</b>
#24681	CPD-200ES	17 1/16"	1280 x 1024	0.25mm <b>\$399.99</b>
#24869	CPD-400PS	19 1/8"	1600 x 1200	0.25mm <b>\$749.99</b>
#24870	GDM-500PS	21 7/20"	1600 x 1200	0.25mm <b>\$1,199.99</b>

## Removable Drives

**Imomega Zip 100MB Drive** only **\$79.99** Parallel #98525 SCSI #98023  
**Imomega ZipPlus Drive** only **\$99.99** #36821  
Both drives are factory refurbished. While supplies last.

Imomega 100MB Zip Drives		
#70093	Zip 100MB external parallel port	<b>\$119.99</b>
#69404	Zip 100MB external SCSI	<b>\$119.99</b>

Imomega Jaz Drives		
#39162	Jaz 1GB internal SCSI drive, factory refurbished	<b>\$199.99</b>
#15813	Jaz 1GB external SCSI drive, factory refurbished	<b>\$199.99</b>
#36973	Jaz 2GB Internal drive	<b>\$349.99</b>
#36972	Jaz 2GB External drive	<b>\$349.99</b>

## Tax Season is Here!

**TurboTax** The #1 best selling and #1 rated tax software!  
**\$24.99** - \$5 Mail-in rebate  
**\$19.99** #38540 Win 95/98  
Up to \$30 off ANY Quicken 99 when you buy ANY TurboTax product!\*

\*Excludes TurboTax State, Quicken Financial Center, and Quicken/Family Lawyer \$30 mfr. mail-in not to exceed purchase price of Quicken 99. Not valid with any other Quicken offer, TurboTax rebates still apply. Offer expires 2/27/99

#38555 TurboTax Deluxe Win (after \$20 mfr. mail-in rebate) **\$29.99**

## SYMANTEC

#34407 Winfax PRO 9.0 Win 95/98/NT **\$114.99**  
#33892 Norton AntiVirus 5.0 Win 95/98 (After \$20 mfr. mail-in rebate) **\$18.99**

## Microsoft

#98166 Office 97 Pro upgrade w/CBT Tutorial (after \$40 mail-in rebate) **\$264.99**  
#98169 Office 97 Pro CD w/CBT Tutorial Win 95/98/NT **\$499.99**  
#36662 Graphic Studio PhotoDraw 2000 (after \$40 mfr. mail-in rebate) **\$99.99**  
#99424 FrontPage 98 Full Version, Win95/NT (after \$40 mfr. mail-in rebate) **\$94.99**  
#31163 Windows 98 Upgrade w/FREE Inoculan AntiVirus **\$89.99**

## Scanners

**Astra 1200S 30-bit Color Legal Scanner** only **\$149.99** #38990  
30-bit ■ 600 x 1200dpi  
Fast SCSI interface  
Up to 8.5" X 14"

#29046 Astra 1220P- 36-bit, 600 x 1200dpi optical (Price reflects \$30 rebate) **\$79.99**  
#29045 Astra 1220S 36-bit, 600 x 1200dpi, SCSI (price reflects \$30 rebate) **\$149.99**

## UMAX

#35571 HP ScanJet 4100Cse Scanner 36-bit Color, 600 x 600dpi, USB **\$199.99**  
#25471 HP ScanJet 5100Cse Scanner 36-bit Color Image Processor **\$299.99**  
#34857 NEW HP ScanJet 6200Cse Professional Scanner SCSI and USB **\$399.99**  
#34856 NEW HP ScanJet 6250Cse Professional Scanner with ADF **\$499.99**

## Digital Cameras

#34049 Toshiba PDR-M1 1.5 Million Pixel Digital Camera, 1280 x 1024 **\$499.99**  
#36889 Nikon CoolPix 900s, 1280 x 960, 8MB, 3X zoom, Nikkor lens **\$726.99**  
#15454 Olympus D-600L, 1280 x 1024, 4MB, 3X Zoom was **\$999.99** now **\$899.99**  
#35603 Sony Mavica FD81 Floppy Disk Camera, 1024 x 768, 3X Zoom **\$799.99**  
#37314 Sony Mavica F091, 1024 x 768, Records on 3.5" floppy media **\$999.99**

# BUY FROM THE BEST!

- ✓ Fastest Overnight Delivery. Order Until 10 p.m.—Get It Tomorrow By 10:30 a.m.!
- ✓ Over 50,000 Products!
- ✓ \$2 Billion In Available Inventory!
- ✓ Open Accounts and Leasing!
- ✓ Custom Configuration!
- ✓ Volume Discounts!

**Call Us At 1-888-932-2490**

Use Source Code #ZPCW921

Order Any Time! Open 24 Hours.

**Or Visit Us Online @ [savemore.pcmall.com](http://savemore.pcmall.com)**

## And Get...

- ✓ The Most Up-to-Date Pricing and Deals!
- ✓ The Newest Products!
- ✓ Unadvertised Specials!
- ✓ The Latest Product Availability!

**Before You Buy—Call Us Toll Free or Visit Us Online!**

Call Today to Get Your **FREE PC Mall Business Catalog** or [pcmall.com](http://pcmall.com) Consumer Catalog

## No Credit Card Surcharges



We accept Visa, MasterCard, American Express and Discover! **Open Account.** PC Mall offers Net 15-day terms to government agencies, schools and businesses with instant approval to qualified customers. Your Personal Account Manager can assist you in your application. Please allow up to 3 days for credit approval.

**Leases.** Lease anything from one PC to one hundred at truly affordable rates!

**Volume Licensing.** Supply your entire office with the latest software versions. Call for details.

Prices and specifications subject to change without notice. We do our best to be accurate but occasionally mistakes occur. We are not responsible for any typographical, photographic or technical errors. NOTE: Products and packaging depicted may differ from stock available at time of shipment; we reserve the right to substitute equivalent items.

Circle 66 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)





Shop On-line at  
**pczone.com**<sup>TM</sup>  
Expect the Best Business Solutions!<sup>TM</sup>

**GUARANTEED LOW PRICES!**

Computer prices change all the time. If you find any item advertised for less in a current national catalog or publication, we'll match their in-stock price. Call for complete details.

**A trusted PC source since 1989!**

**Over 50,000 Products Available!**  
**Order Today, Have it Tomorrow**

on in-stock items

**ThinkPad 390**  
MMX 233MHz,  
32MB RAM,  
3.2GB HD,  
24X CD,  
12.1" TFT display,  
56K modem

**ONLY \$1649**  
#83791

**COMPAQ Deskpro EN**  
P2-233MHz  
32MB/  
6.4GB HD  
24X CD

**ONLY \$1099**  
#05290

**TOSHIBA Satellite 4020CDT P2-300**  
64MB/6.4GB/24XC  
D/56K/13.3xGATFT

**ONLY \$2699**  
#84685

**HP LaserJet 1100se Printer**

**ONLY \$399<sup>98</sup>**  
#60286

**Hot Product!**

Notebooks		
IBM NOTEBOOKS		
ThinkPad 390 Series NEW!		
390 MMX233 32/3.2 24X 12.1 TFT 56K	#83791	\$1,649
390 P2-233 32/3.2 24X 12.1 TFT 56K	#83792	\$1,929
390 P2-266 64/4.0 24X 14.1 TFT 56K	#83793	\$2,499
ThinkPad 600 Series		
600 P2-233 32/3.2 24X 12.1 TFT 56K NT	#05146	\$2,749
600 P2-300 64/5.1 24X 13.3 TFT 56K	#57165	\$4,099
600 P2-300 64/5.1 24X 13.3 TFT 56K NT	#57166	\$4,169
600E P2-300 64/6.0 DVD 13.3 TFT 56K	#57167	\$4,347
ThinkPad 770		
770X P2-300 64/8.1 24X 14.1 TFT 56K NT	#57174	\$4,639
770X P2-300 64/8.1 DVD 14.1 TFT 56K	#57173	\$4,733
770X P2-300 128/8.1 24X 13.7 TFT 56K NT	#57172	\$5,049
770X P2-300 128/8.1 DVD 13.7 TFT 56K	#57171	\$5,111
Zip Drive for 770	#11997	\$199.95
COMPAQ		
Armada 1700 Series		
1700 P2-233 32/3.2 56K 12.1 CSTN	#74695	\$1,769
1700 P2-233 32/4.0 24CD 12.1 CTFT 56K	#08061	\$2,099
1700 P2-266 32/4.0 24CD 13.3 CTFT 56K	#08062	\$2,499
1700 P2-300 32/5.0 56K 14.1 CTFT	#74694	\$3,299
Armada 6500 Series		
6500 P2-300 64/6.4 24CD 14.1 CTFT W95	#74753	\$3,999
6500 P2-300 64/6.4 24CD 14.1 CTFT NT	4.0#74755	\$4,465
Armada 7800 Series		
7800 P2-266 64/5.0 20CD 13.3 CTFT	#01549	\$3,494
7800 P2-266 64/5.0 13.3 CTFT NT	#01548	\$3,828
Presario 1200 Series		
1235 K6-266 32/4.0 24CD 12.1 HPA	#74652	\$1,499*
1240 MMX266 64/4.0 24CD 12.1 TFT	#74653	\$1,799*
1250 K6-300 64/6.4 24CD 12.1 TFT	#74658	\$1,999*
*After \$100 mfr. mail-in rebate.		
Presario 1800 Series		
1810 P2-300 64/6.4 DVD 13.3 TFT	#74599	\$2,999*
*After \$100 mfr. mail-in rebate.		
Presario 1600 Series		
1650 P2-266 64/4.0 12.1TFT 56K W98	#07994	\$2,399
1655 P2-266 64/4.0 13.3TFT 56K W98	#08017	\$2,499
TOSHIBA		
Satellite/Satellite PRO Series		
4000CDS P2-233MHz 32MB/4.1GB HD, 24X CD, 56K Flex Card, 12.1 SVGA DSTN	#08832	\$1,549
4000CDT P2-233MHz 32MB/4.1GB HD, 24X CD, 56K Flex Card, 12.1 SVGA TFT	#54323	\$1,699
4010CDS P2-266MHz 32MB/4.1GB HD, 24X CD, 56K Flex Card, 12.1 SVGA DSTN	#55308	\$1,699
4010CDT P2-266MHz 32MB/4.1GB HD, 24X CD, 56K Flex Card, 12.1 SVGA TFT	#84638	\$1,949
4020CDT P2-300MHz 64MB/6.4GB HD, 24X CD, 56K Flex Card, 13.3XGA TFT	#84685	\$2,699
Portege Series		
7000CT P2-266 32/4.3 56K 12.1TFT	#27137	\$2,599
7000CT P2-266 32/4.3 56K 12.1TFT NT	#54511	\$2,799
7010CT/W95 P2-300 32/4.3 12.1TFT	#56545	\$3,199
7010CT/NT P2-300 32/4.3 12.1TFT	#56546	\$3,399
3010CT MMX266 32/4.3 56K 10.4TFT	#100243	\$1,919
Tecra Series		
8000 P2-233 32/4.0 24CD 56K 12.1TFT	#27280	\$2,429
8000 P2-266 64/6.4 24CD 56K 13.3XGA TFT	#27285	\$2,999
8000 P2-300 64/6.4 24CD 56K 13.3XGA TFT	#84641	\$3,399
8000 P2-300 64/8.1 24CD 56K 14.1XGA TFT	#56548	\$3,889
Libretto Series		
110CT MMX233 32/4.3 56K 7.1 TFT	#100243	\$1,729
Hewlett Packard OmniBook Series		
2105 P2-233MHz MMX 32MB/3.2GB HD 24X CD 12.1 TFT	#102306	\$2,189
2105 P2-266MHz MMX 32MB/4.0GB HD 24X CD 12.1 TFT	#102307	\$2,584

Desktops		
IBM		
4101 P2-233MHz MMX 32MB/4.0GB HD 24X CD 14.1 TFT	#16649	\$2,869
4151 P2-300MHz 32MB/6.4GB HD 24X CD 14.1 TFT	#102309	\$4,559
7100 P2-266MHz 32MB/8.1GB HD 24X CD 14.1 TFT	#18115	\$4,529
7150 P2-300MHz 64MB/8.1GB HD 24X CD 14.1 TFT	#102310	\$4,949
COMPAQ Deskpro EP Series		
4300 Cel2-300MHz 32MB/4.3GB/W95	#74687	\$724.98
4300 Cel2-333MHz 32MB/4.3GB/W95	#74688	\$756.98
6400 Cel-333MHz 64MB/6.4GB/32CD/W95	#74689	\$1,019
4300 P2-350MHz 64MB/4.3GB/W95	#74690	\$1,122
6400 P2-400MHz 64MB/10.0GB/32CD/W95	#74692	\$1,553
6400 P2-450MHz 64MB/10.0GB/32CD/W95	#74693	\$1,688
COMPAQ Deskpro EN Series		
3200 P2-300MHz 32MB/3.2GB/NIC/W95 DT	#05293	\$1,179
3200 P2-333MHz 32MB/3.2GB/NIC/W95/DT	#05295	\$1,179
6400 P2-333MHz 32MB/6.4GB/24CD/NIC/W95/MT	#05316	\$1,398
Presario Series		
2285 MII-333MHz 32MB/4.0GB/32CD/56K	#84645	\$699.98*
5050 Cel 333MHz 96MB/8.0GB/32CD/56K	#26859	\$799.98*
5150 K6-350MHz 128MB/8.0GB/32CD/56K	#74659	\$999.98*
5170 P2-350MHz 128MB/10.0GB/32CD/56K	#74661	\$1,199*
*Price after \$100 mfr. net cash rebate		

TOSHIBA		
Equium VS7100 P2-333 64MB/4.0GB HD, 32X CD, 3Com 10/100 W95	#100249	\$999.98
Equium VD7100 P2-333 64MB/4.0GB HD, 32X CD, 3Com 10/100 W95	#100250	\$999.98
Equium VS7100 P2-400 64MB/6.0GB HD, 32X CD, 3Com 10/100 W95	#100251	\$1,299
Equium VD7100 P2-400 64MB/6.0GB HD, 32X CD, 3Com 10/100 W95	#100252	\$1,299
Equium VS7100 P2-450 128MB/8.0GB HD, 32X CD, 3Com 10/100 W95	#100253	\$1,699
Equium VD7100 P2-450 128MB/8.0GB HD, 32X CD, 3Com 10/100 W95	#100267	\$1,699
HEWLETT PACKARD		
Brio 7100 Cel 300MHz 32MB/2.1GB/32CD/W98	#16756	\$829.98

Brio 8531 P2-350 32MB/8.0GB/32CD/W98 MT	#16735	\$1,199
Brio 8533 P2-450 64MB/8.0GB/32CD/W98 MT	#100125	\$1,819
Vectra VL8 P2-350MHz 32MB/4.3GB/32CD/W95/NT MT	#26618	\$1,499
Vectra VL8 P2-400MHz 64MB/6.4GB/32CD/W95/NT DT	#60240	\$1,749
Vectra VL8 P2-450MHz 64MB/6.4GB/32CD/W95/NT DT	#60279	\$2,129

UMAX		
Umax P2-333MHz 64MB/6.4GB HD, 36X CD, 56K, 8MB AGP	#100212	\$899.98
Umax K6-2 350MHz 64MB/6.4GB HD, 36X CD, 56K 8MB AGP	#100213	\$899.98
Umax P2-400MHz 64MB/8.4GB HD, 36X CD, 56K, 8MB AGP	#54647	\$1,299
Umax P2-400 w/17" Monitor, Printer and Scanner	#55381	\$1,749
Umax P2-400 w/17" Monitor, 10/100 NIC	#100254	\$1,499

Printers		
Epson Stylus Color 740	#31720	\$279.98
HP DeskJet 1120Cse	#57734	\$499.98
HP LaserJet 6Pse Printer	#41036	\$799.98
HP LaserJet 4000N Network Printer	#53213	\$1,389
Tektronix Phaser 740 Color	#76646	\$1,995

Digital Cameras		
Nikon Coolpix 900s (1280 x 960)	#90636	\$749.98
Dilympus D-620L (1280 x 1024)	#96864	\$1,199
Kodak DC260 (1536 x 1024)	#73283	\$899.98
Sony Mavica FD81 (1024 x 768)	#93849	\$799.98*
Sony Mavica FD91 (1024 x 768)	#93851	\$999.98*
*Receive Sony 10Pk Diskettes FREE w/purchase		

Scanners		
Umax Astra 1200S Dlx	#17950	\$149.98
Umax PowerLook II	#18393	\$795.98
Microtek ScanMaker X6EL	#18400	\$239.98
HP ScanJet 5100	#53251	\$299.98
Agfa SnapScan EZ EPP	#58444	\$129.98

Monitors		
Sony 100ES 15"/14 view, 25AG	#46785	\$229.98
Sony 200ES 17"/16 view, 25 AG	#46791	\$379.98
Viewsonic G790 19"/18 view, 26 dp	#46781	\$579.98
Sony W900 21"/22.5 view, 25-28 dp	#80665	\$2,149
ViewSonic VPA145 15" flat panel	#46787	\$879.98

Modems and PC Cards		
USR 56K V.90 Internal Faxmodem	#57377	\$127.98
USR 56K V.90 External Faxmodem	#57378	\$147.98
XJACK 56K V.90 Cell Capable PCMCIA	#13435	\$219.98
EtherLink III 10BT / TN LAN PC Card	#43374	\$169.98
56K V.90 10/100TX Cable Connect Combo PCMCIA	#13210	\$294.98

Networking		
3Com EtherLink XL 10/100 PCI Card	#60326	\$85.98
Intel Pro/100 Plus 10/100 PCI Card	#48792	\$79.98
NetGear 10/100 PCI Card	#41161	\$28.98
3Com OfficeConnect 10Base-T Hub TP4 (4 RJ45/10T)	#46266	\$46.98
3Com OfficeConnect 10Base-T Hub 8/TPD (1 AUI/8RJ45)	#32044	\$96.98

3Com OfficeConnect 100Base-T Hub 4 100TX (4 RJ45)	#50789	\$98.98
Intel InBusiness 4 Port 100TX (4 RJ45)	#57333	\$98.98
NetGear 10/100 8Port Hub w/Uplink	#03853	\$218.98
Intel InBusiness 8Port 10/100 (8 RJ45)	#15875	\$249.98
Asante FriendlyNet 4004E 4 Port 10/100 Switch	#15877	\$214.98

Storage		
Hard Drives		
Quantum 6.4GB EIDE Ultra ATA 9.5ms		
512K 5400RPM	#87868	157.98
Quantum 10.2GB EIDE Ultra ATA 9.5ms		
512K 5400RPM	#15027	\$229.98
18M 8.4GB EIDE Ultra DMA 9.5ms		
512K 5400RPM	#55125	\$198.98
Quantum Viking II 4.5GB SCSI-3 Wide		
7.8ms 512K 7200RPM	#70393	\$279.98
Quantum Stratus 6.4GB Ultra SCSI-3		
10ms 128K 5400RPM	#57039	\$335.98
18M Ultrastar 2XP 9.1GB SCSI-3 Wide		
8.5ms 512K 7200RPM	#43124	\$472.98
3.5" Hard Drive Mounting Kit	#94943	\$7.98
Hard Drive prices subject to change. Please call for current pricing!		
Removable Drives		
Iomega Zip 100MB Int ATAPI Drive	#51752	\$99.95
Iomega Zip 100MB USB EXT Drive	#95251	\$149.95
Iomega Zip 100MB Parallel Ext Recond.	#55182	\$79.95
Iomega Zip SCSI Ext Recond. Drive	#55181	\$79.95
Iomega Jaz 2GB SCSI External Drive	#95234	\$349.95
Media		
Iomega Zip Color 10 Pack	#51751	\$99.95
Iomega Jaz 1GB 3 Pack	#50269	\$269.85
Iomega Jaz 2GB 3 Pack	#51754	\$299.85
Fuji Zip Color 10pk w/\$10 rebate	#35414	\$89.98*
*After \$10 mfr. mail-in rebate. Low Zone Price \$99.98		
Fuji Zip Gray 20 Pack with 4 free disks by mail	#51767	\$198.98

Software		
Microsoft Office 97 Pro Upgrade w/Bookshelf Basics	#40207	\$309.98
Microsoft Office 97 Pro w/Bookshelf Basics	#40206	\$449.98
Microsoft Windows 98 Upgrade CD	#03203	\$89.98
Microsoft Windows NTWorkstation 4.0	#55819	\$274.98
Symantec pcANYWHERE32 8.0 H&R	#27304	\$156.98
Symantec WinFax Pro 9.0 for Win95/NT Upgrade	#44224	\$55.98
Symantec Norton SystemWorks	#24890	\$54.98*
*After \$10 mfr. mail-in rebate. Low Zone Price \$64.98		
Adobe PageMaker 6.5 for Win95 Upgrade	#37610	\$118.98
Adobe Illustrator 8.0 Upgrade	#88821	\$118.98
Adobe Photoshop 5.0 Upgrade	#17245	\$178.98
Adobe Photoshop 5.0 Full	#32955	\$598.98
Adobe Graphic Studio	#71271	\$924.98
DuarkXPress 4.0 for Windows 95	#11910	\$698.98
Macromedia Dreamweaver 2.0	#54230	\$298.98



**www.pczone.com**  
**1.800.431.9663**  
**Expect the Best!**  
Low Prices • Selection • Expertise  
If for any reason you are not satisfied, please call our No Excuses Hotline: 1-800-258-0270.

Prices and product availability subject to change without notice. Specials and promotions may be limited to stock on hand. Not responsible for typographical errors.  
©1999 Copyright Multiple Zones International Inc. All rights reserved. Unauthorized duplication is a violation of applicable laws. Intel, Intel Inside, and Pentium are registered trademarks of the Intel Corporation.

**we're open 24 hours a day 7 days a week**

Call for your **FREE CATALOG!**  
Stay on top of the latest computer products!

**Corporate bids welcome! Fax to 1-800-684-8080**

NO SURCHARGE ON CREDIT CARDS

**Source Code PW902**

A NASDAQ COMPANY Ticker Symbol: MZON



# Just like new. Only better.

**One-year parts and labor warranty.  
ONLY through the Sony Factory Outlet.**

## Displays:

CPD-100ES:	\$149.99
CPD-100VS:	\$172.99
CPD-100GS:	\$199.99
CPD-120VS:	\$229.99
CPD-200ES:	\$299.99
CPD-200GS:	\$329.99
CPD-220VS:	\$399.99
CPD-20SFII:	\$450.99
GDM-200PS:	\$499.99
CPD-420GS:	\$549.99
CPD-300SFT:	\$559.99
GDM-400PS:	\$649.99
CPD-520GS:	\$849.99
GDM-500PS:	\$999.99
CPD-L150:	\$1,299.99
CPD-F500:	\$1,799.99
GDM-W900:	\$1,999.99



**CPD-200ES:**  
**\$299.99**  
Original: \$399.99

- 17" CRT Trinitron Display (16" VIS)
- 0.25 mm Aperture Grille Pitch
- 1280 x 1024 Resolution (at 60 Hz)

It's not easy to top the quality of a Sony Trinitron® Display. After all, what could be better than a sharp picture, bright color, reduced glare and a vertically flat screen?

Except maybe a better price.

The Sony Factory Outlet is the place to get great Sony Displays—at great prices. Because all the products at the Outlet are refurbished. That means each display has gone through an extensive nine-step process to make sure it works like new. So they all perform at 100%. But they're all reduced by 20 to 35%.

We're confident that every product is as good as new. That's why everything you purchase through the Outlet comes with a one-year limited warranty on parts and labor. That's a Sony Factory Outlet exclusive.

And we have more than just displays. You can get Sony VAIO® PCs and Notebooks, too. All with the same great warranty and performance.

Supplies are limited. So call today, or visit us online, and see for yourself how Sony-quality never expires.

**Trinitron**

**SONY**

©1998 Sony Electronics Inc. All rights reserved. Reproduction in whole or in part without written permission is prohibited. Prices and specifications are valid only in the U.S. and are subject to change without notice. Prices do not include applicable sales tax or shipping. Sony, VAIO, Trinitron and the Sony logo are trademarks of Sony. The online Sony Factory Outlet is being offered by a third party, International Marketing Group, Inc. (IMG). IMG is not affiliated with Sony Electronics Inc.



**CPD-100ES:**  
**\$149.99**  
Original: \$229.99

- 15" CRT Trinitron Display (14" VIS)
- 0.25 mm Aperture Grille Pitch
- 1280 x 1024 Resolution (at 60 Hz)



**CPD-300SFT:**  
**\$559.99**  
Original: \$1,099.99

- 20" CRT Trinitron Display (19" VIS)
- 0.30 mm Aperture Grille Pitch
- 1600 x 1200 Resolution (at 66 Hz)

**Buy it direct from the Sony Factory Outlet.**

**1 - 8 8 8 - 8 3 9 - S O N Y** TOLL FREE

**or**

**[www.sony.com/factory-bestbuy](http://www.sony.com/factory-bestbuy)**





# MicroWAREHOUSE®

The largest direct computer reseller in the world!

## Same-day shipping on 30,000

Microsoft • Compaq • IBM • Hitachi • Toshiba • Hewlett-Packard • 3Com

### Medalist 8.6GB Ultra ATA Hard Drive

Only  
**\$219<sup>95</sup>!**  
DR8079

- Seagate model # ST38641A
- 5400 RPM spindle speed

**Seagate**



### USR V.90 56K Faxmodem

Internal only  
**\$127<sup>99</sup>!**  
DMD3947

- V.90 ITU standard and X2 compatible

External modem (shown), only \$147.99. Ask for item # DMD3441.

Get \$50  
GIFT CERTIFICATE\*  
to CDnow.com!

\*Buy any eligible USR 56K fax/modem and ask for coupon # AA1294. Mail the coupon to 3Com and they will e-mail you a special password worth \$50 towards music purchases at CDnow.com! E-mail information required to fill CDnow order. Offer expires 1/31/99

### Windows NT Workstation 4.0

Upgrade only  
**\$129<sup>95</sup>!**  
UP4004

**Microsoft**

Full Version; only \$269.95. Ask for item # OP0819.

**Windows NT Workstation**

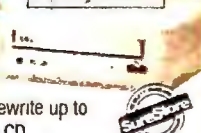
Upgrade from previous version of Windows NT Workstation only

### HP Surestore CD-Writer Plus

7200  
External 2x2x6  
**\$399<sup>95</sup>!**  
BN6001

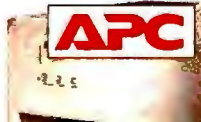
**HEWLETT PACKARD**  
Expanding Possibilities

- Write, update, erase, and rewrite up to 650MB of data on a single CD
  - Includes 5 FREE CDRs & 1 FREE CDRW
- 7200 Internal 2x2x6 (shown); only \$299.95. Item # DR7994.  
8100 Internal IDE 4x2x4, w/5 FREE CDRs & 1FREE CDRW; only \$379.95. Item # BN5911.



### APC 200VA UPS

Only  
**\$89<sup>99</sup>!**  
DUP2098



- Manufacturer's 2-year warranty
- Full-time surge protection and instantaneous battery back-up to protect your equipment against brownouts, overvoltages, and blackouts.

## COMPAQ Deskpro EP Blowout



Only  
**\$999!**  
ITEM # CP9089

- 333MHz Celeron processor
- 128KB full-speed cache
- 6.4GB hard drive
- 64MB SDRAM (256MB max.)
- 32X CD-ROM
- Flexible desktop/mini-tower chassis
- Windows 95

### HP 1100se LaserJet

- 8ppm black • 600 dpi
- 2MB standard RAM (18MB max.)
- Optional networking

HP LaserJet 1100

Only  
**\$399<sup>95</sup>!**  
Item # PR14205

**HEWLETT PACKARD**

Rotates from a desktop to a tower!

### Q71 17" Monitor

Only **\$279<sup>95</sup>!** ITEM # MT2266  
• 17" (16" viewable) • 27mm dot pitch

**Optique**

### NEW! IBM THINKPAD 390

**IBM**

- 233MHz Pentium® processor w/MMX
- 3.2GB hard drive • 32MB RAM
- 24X CD-ROM • 56K modem
- 12.1" TFT display

Only  
**\$1699!**  
Item # CP9784



### IBM PC300PL MINITOWER SYSTEM

**IBM**

- 450MHz Pentium® II processor
- 6.4GB hard drive • 64MB RAM
- 32X CD-ROM • 16-bit sound
- 3D AGP graphics w/4MB

Only  
**\$1819!**  
Item # CP9095



### COMPAQ PROLIANT 1600 SERVER

**COMPAQ**

- 350MHz Pentium® II processor
- 64MB RAM (1GB max.)
- Hot pluggable drive cage
- Dual ultra-wide SCSI controller

Only  
**\$2129!**  
Item # CP8490



### NEW! EPSON STYLUS COLOR 640

**EPSON**

- 1440 x 720 dpi
- Laser quality black text
- 5ppm black
- 3.5ppm color

Only  
**\$199<sup>95</sup>!**  
Item # PR14064



• Visa, MasterCard, Discover Card/NOVUS, and AmEx accepted. Your credit card will not be charged until each item is shipped (no surcharge)

• Overnight Delivery just \$9.95 per order up to 5 pounds. For all orders over 5 pounds, shipping is \$9.95 plus an additional \$1.50 per pound or fraction thereof. (Example: shipping for a 6 pound order is \$11.45). Please add an additional \$3.00 for orders \$50.00 and under. Orders for "in-stock" items placed on weekdays up until 12:00 midnight (E), 10:00 pm (E) for Internet orders, ship same day for overnight delivery (barring system failure, etc.). Some areas require an extra day. All U.S. shipments are insured at no extra charge. UPS Ground service available at current UPS rates plus \$2.95 handling charge per

order (except C.O.D.). UPS orders for "in-stock" items placed by 3:00pm (E) (weekdays) ship same day. We anticipate being able to ship "out of stock" items within 30 days. CT, IL, NJ, OH, VA, and WA residents add applicable sales tax.

• Return Policy — Every item we sell comes with the MicroWAREHOUSE 30-day Guarantee Against Defects. If your product is defective in any way, all you have to do is call our Customer Service Department at 1-800-925-6227 for a Return Merchandise Authorization (RMA) number within 30 days of the original invoice date. Defective software will be replaced immediately upon receipt of the defective product. Defective hardware will be replaced or repaired at our discretion, except for products from

Compaq (1-800-652-6672), Hitachi (1-800-555-6820), or IBM (1-800-426-7378). These manufacturers must be contacted directly, and will repair or replace products at their sole discretion. Should you return hardware to MicroWAREHOUSE from Compaq, Hitachi, IBM, or USA Flex, you will be assessed a 15% restocking fee which will be charged to your account. All returns are subject to the following:

1. All products must be returned in original packaging.
2. Shipping and handling charges are not refundable.
3. Software and consumables are not refundable unless returned unopened in original packaging with documentation.
4. Custom orders and cables are not refundable.

Copyright © 1999 Micro Warehouse Inc. All rights reserved.

Micro Warehouse, Inc. is not responsible for typographical or photographic errors that may appear in this ad. Item availability and price are subject to change without notice. We reserve the right to quantities. Please remember to back up all of your data before installing any new hardware, software, or peripherals; we cannot be responsible for any lost data. Since we are not the manufacturer, publisher of any of the products we sell, Micro Warehouse makes no representations or warranties of any kind and assumes no liability concerning whether any of the products or services sold by us are 2000 Compliant. Year 2000 representations and warranties may be supplied directly to our customers by the manufacturers or publishers of certain products.



# MicroWAREHOUSE

The largest direct computer reseller in the world!

## computer products!

On in-stock items. Call by midnight Eastern or order on-line by 10pm Eastern.

lomega • Epson • NEC • APC • Olympus • USRobotics

### TOSHIBA Portege 3010CT

HEWLETT  
PACKARD

HP JORNADA 820  
HANDHELD

NEW!

2.5 lbs  
8.2" color  
VGA CSTN  
display  
16MB RAM  
190MHz RISC  
processor  
56Kbps modem  
Lithium-ion rechargeable battery pack  
Runs Microsoft Windows CE (H/PC Professional Edition)

Only  
**\$1999!**

ITEM # CP10057

- 266MHz Pentium® processor w/MMX technology
- 4.3GB hard drive
- 32MB RAM • 56Kbps modem
- 10.4" TFT display
- Manufacturer's 1-year warranty

Only  
**\$899!**  
Item # CP9566



The ONE Place to Go!



Ultra-portable!  
Thin — only .75"!  
Light — only 2.8 lbs!

32MB RAM  
UPGRADE  
for Portege 3010CT  
**ONLY \$109<sup>95</sup> ea.**  
ASK FOR ITEM # MY11446.



**MicroWAREHOUSE**  
is the winner of the  
1998 Computer Shopper  
"Direct Channel Industry  
Achievement Award  
for Peripherals" and the  
"Best Place to Buy  
Notebook PCs Award"!

#### lomega® 100MB Zip™ Drive

SCSI  
Insider Internal  
Zip Drive Only  
**\$119<sup>95</sup>!**  
DR5279

Includes  
a Zip Zoom  
accelerator card!  
A \$49<sup>95</sup> value!

Internal ATAPI, only \$99.95.  
Item # DR8318.  
External parallel port (shown);  
only \$119.95. Item # DR9278.  
\*Manufacturer's suggested retail.  
While supplies last.



#### lomega 2GB Jaz Drive

Internal only  
**\$399<sup>95</sup>!**  
DR7070

Includes  
first  
cartridge!

External SCSI (shown);  
only \$399.95. Ask for item # DR12300  
lomega Buz Multimedia Producer;  
only \$199.95. Ask for item # EXB161.



#### D-600L Digital Camera

Now only  
**\$899<sup>95</sup>!**  
was \$999.95  
IN6660

OLYMPUS

3X zoom  
lens!

- 1280 x 1024 resolution
- 3X zoom lens
- 4MB Smart Media card



#### HP ScanJet 5100CSE

Only  
**\$299<sup>95</sup>!**  
IN6818

- 600 dpi hardware super sampling, 1200 dpi enhanced
- 36-bit color imaging
- Includes PrecisionScan with integrated OCR, Adobe PhotoDeluxe and scanning software



#### LAPTOPS IBM. COMPAQ TOSHIBA

77B: IBM Thinkpad 380Z PII/233MHz, 4.0GB, 32MB, 24X, 13.3" TFT, Win 98	\$1799.00
7B1: IBM Thinkpad 560Z PII/300MHz, 6.4GB, 64MB, 12.1" TFT, Win 98	\$3249.00
7BB: IBM Thinkpad 600E PII/300MHz, 6.0GB, 64MB, DVD, 56k, 13.3" TFT, Win 98	\$4299.00
701: IBM Thinkpad 770X PII/300MHz, 8.1GB, 64MB, DVD, 14.1" TFT, Win 98	\$4659.00
741: Toshiba Satellite 4000CDS PII/233MHz, 4.0GB, 32MB, 20X, 56K, 12.1" SVGA DSTN	\$1499.00
740: Toshiba Satellite 4000COT PII/233MHz, 4.0GB, 32MB, 20X, 56K, 12.1" SVGA TFT	\$1699.00
760: Toshiba Satellite 4010CDS PII/266MHz, 4.0GB, 32MB, 20X, 56K, 12.1" SVGA DSTN	\$1599.00
761: Toshiba Satellite 4010COT PII/266MHz, 4.0GB, 32MB, 20X, 56K, 12.1" SVGA TFT	\$1799.00
7B1: Compaq Armada 1700 PII/233MHz, 3.2GB, 32MB, 24X, 56K, 12.1" SVGA CSTN	\$1699.00
717: Compaq Armada 1700 PII/266MHz, 4.0GB, 32MB, 24X, 56K, 13.3" XGA CTFT	\$2649.00

#### DESKTOPS IBM. COMPAQ HEWLETT PACKARD

707: Compaq Deskpro EN Celeron/300MHz, 32MB, 3.2GB, 32X, Win 95, MT	\$1019.00
709: Compaq Deskpro EN Celeron/333MHz, 32MB, 6.4GB, 32X, Win 95, MT	\$1169.00
765: Compaq Deskpro EN PII/350MHz, 32MB, 6.4GB, NIC, Win NT, DT	\$1399.00
704: Compaq Deskpro EN PII/450MHz, 64MB, 10GB, NIC, Win NT, MT	\$1899.00
790: IBM PC300GL PII/350MHz, 32MB, 3.2GB, Win 98, DT	\$1029.00
794: IBM PC300PL PII/350MHz, 32MB, 3.2GB, Win 98, DT	\$1319.00
796: IBM PC300PL PII/450MHz, 64MB, 6.4GB, 32X, Win NT, MT	\$1839.00
769: HP Brio B531 PII/350MHz, 32MB, 8.0GB, 32X, MT, Win 98	\$1199.00
770: HP Brio B532NT PII/400MHz, 64MB, 8.0GB, 32X, MT, Win NT	\$1599.00

#### MONITORS NEC Optquest

561: NEC A500+ 15", 13.8" viewable, 1280 x 1024 @ 60Hz	\$189.95
562: NEC A700+ 17", 15.6" viewable, 1280 x 1024 @ 65Hz	\$389.95
451: Optquest Q53 15", 13.8" viewable, 1280 x 1024 @ 60Hz	\$179.95
580: Optquest V95, 19", 18" viewable, 1600 x 1200 @ 76Hz	\$529.95

#### SCANNERS HEWLETT PACKARD

IN7313: HP ScanJet 4100CSE	\$199.95
IN6B1B: HP ScanJet 5100CSE	\$299.95
IN7311: HP ScanJet 6200CSE	\$399.95
IN7312: HP ScanJet 6250CSE w/25 page Auto Document Feeder <b>NEW!</b>	\$499.95

#### PRINTERS HEWLETT PACKARD LEXMARK XEROX

PR13440: HP LaserJet 5000 Printer 16ppm/prints 11 x 17	\$1479.95
PR12977: HP LaserJet 4000se Printer 17ppm/1200 dpi	\$1149.99
PR14129: HP DeskJet 712C 6ppm blk/3ppm color	\$199.95
PR12864: HP DeskJet 722C 8ppm blk/4ppm color <b>NEW!</b>	\$279.95
PR1412B: HP DeskJet 697C 5ppm blk/1.7ppm color <b>NEW!</b>	\$149.95
PR13789: Lexmark Optra K 1220 12ppm/600 dpi	\$729.95
PR13601: Dikidata Okipage 10i, 10ppm/600 dpi	\$499.95
PR14147: Xerox DocuPrint N17 17ppm/1200 x 600 dpi/network	\$1299.00
PR14305: Xerox DocuPrint P12 12ppm/600 dpi/optional network	\$699.95
PR13769: Cannon BJC-5000 Color Printer 1440 x 720 dpi/7.5ppm blk/3ppm color	\$229.95

#### MODEMS 3Com U.S. Robotics Megahertz

OMD3205: 3Com Megahertz 56K X2 upgradable PC card WIN modem w/XJack	\$89.99*
DMD2771: 3Com Megahertz 56K X2 upgradable PC card w/XJack	\$109.99*
DMD4013: US Robotics 56K WIN modem - V.90 - Internal	\$87.99
DMD359B: 3Com Megahertz 56K cellular capable XJack - Mac & PC	\$209.99

\*While promotional supplies last.

#### STORAGE Seagate Western Digital Quantum

DRB69B: Western Digital Caviar B.4GB EIDE Hard Drive	\$229.95
DR9491: Quantum Fireball EX 6.4GB Ultra ATA Hard Drive	\$169.95
DR9150: Quantum Fireball EX 12.7GB Ultra ATA Hard Drive	\$319.95
DRB18B: Seagate Barracuda 18.2GB Ultra SCSI Hard Drive	\$929.95
DRB189: Seagate Barracuda 18.2GB Ultra -wide SCSI Hard Drive	\$929.95

1-800-793-4960 ★ www.warehouse.com/pw

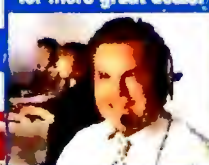
ORDER TOLL-FREE 24 HOURS A DAY, 7 DAYS A WEEK!

**MicroWAREHOUSE**  
The largest direct computer reseller in the world!

**EXPRESS DELIVERY  
OVERNIGHT!**

In-stock items,  
call by midnight (E).

Hi, I'm Robert. Call me  
for more great deals!



Circle 231 on card or go to www.pcworld.com/internet



# Get the CDW<sup>®</sup> ADVANTAGE

CDW custom-configures more than 500 computers each day. Let us provide your computing solution today.



The Better Business Bureau<sup>®</sup>

CDW wins the 1998 Better Business Bureau Torch Award for Marketplace Ethics.

CDW offers toll-free technical support for the life of your product.

# REAL

## COMPAQ

### Deskpro EP

- ◆ 350MHz Intel Pentium<sup>®</sup> II processor
- ◆ 512KB Level 2 cache
- ◆ 100MHz Front Side Bus Technology (FSB)
- ◆ 64MB SDRAM standard
- ◆ 6.4GB SMART II Ultra-ATA hard drive
- ◆ 24X Max CD-ROM drive
- ◆ Windows<sup>®</sup> 95



Monitor sold separately

**\$1114.35** CDW 113190



## HP Brio 7133MT



Monitor sold separately

- ◆ 300MHz Intel Celeron<sup>™</sup> processor
- ◆ 128KB Level 2 cache
- ◆ 32MB SDRAM standard
- ◆ 2.1GB hard drive
- ◆ 32X CD-ROM drive
- ◆ 16-bit sound
- ◆ Windows<sup>®</sup> 98

**\$799.84** CDW 127279



## IBM<sup>®</sup> ThinkPad<sup>®</sup> 600

- ◆ 300MHz Intel Pentium<sup>®</sup> II processor
- ◆ 64MB RAM standard
- ◆ 6GB hard drive
- ◆ Internal DVD-ROM drive
- ◆ 13.3" active-matrix display
- ◆ 56Kbps (K56flex) modem
- ◆ Windows<sup>®</sup> 98
- ◆ 3-year limited warranty



**\$4329.69** CDW 129951



## HP 2500Cse

### Professional Series color printer

- ◆ Plain paper drop-on-demand thermal inkjet printing
- ◆ Resolution: 600 x 600 dpi black on plain paper
- ◆ Print speed: up to 9 ppm black, best mode up to 3.5 ppm color
- ◆ 4MB RAM standard
- ◆ HP PCL 3 enhanced
- ◆ 1-year limited parts, labor; first year onsite warranty
- ◆ HP C2686A



**\$1249.00** CDW 138819

## DESKTOPS

### COMPAQ

<b>Prosignia 300 Series desktops</b>	
333 Celeron 32MB 8.4GB	1161.74
350/P II 64MB 10GB	1398.45
450/P II 64MB 10GB	1698.57
<b>Deskpro EP Series towerable desktops</b>	
300 Celeron 32MB 4.3GB	733.70
333 Celeron 32MB 4.3GB	744.57
333 Celeron 64MB 6.4GB 32X	1032.61
350/P II 64MB 4.3GB	1128.34
350/P II 64MB 10GB 32X	1438.50
400/P II 64MB 10GB 32X	1553.76
450/P II 64MB 10GB 32X	1688.17
<b>Deskpro EP Series Solutions for Small Business</b>	
300/P II 32MB 4.3GB 24X	1267.38
350/P II 64MB 4.3GB 24X	1395.72
400/P II 64MB 6.4GB 24X	1510.75
<b>Deskpro EN Series desktops</b>	
300 Celeron 32MB 3.2GB	923.08
300 Celeron 32MB 3.2GB 10/100	989.15
333 Celeron 32MB 3.2GB 10/100	1027.17
333 Celeron 32MB 3.2GB	949.56
333/P II 32MB 4.3GB 10/100	1798.85
350/P II 32MB 6.4GB 24X	1411.76
350/P II 64MB 10GB 10/100	1588.24
400/P II 32MB 6.4GB	1360.22
400/P II 64MB 6.4GB 24X 10/100	1693.55
400/P II 64MB 4.3GB 24X 10/100	1998.75
450/P II 64MB 10GB 10/100	1935.48
<b>Deskpro EN Series mini-towers</b>	
300 Celeron 32MB 3.2GB 32X	1032.61
333 Celeron 32MB 6.4GB 32X	1184.76
333 Celeron 32MB 6.4GB 32X 10/100	1258.64
333/P II 32MB 6.4GB 24X 10/100	1398.42
350/P II 32MB 6.4GB 24X 10/100	1529.41
350/P II 64MB 4.3GB 24X 10/100	1898.45
400/P II 64MB 9.1GB 24X 10/100	2279.57
450/P II 64MB 6.4GB 32X 10/100	1849.46
450/P II 64MB 9.1GB 32X 10/100	2413.98
<b>Presario desktops</b>	
333 Celeron 96MB 8GB 32X	896.00
450/P II 128MB DVD	2096.00

### IBM

<b>PC 300GL Series desktops</b>	
300 Celeron 32MB 3.2GB	857.19
333 Celeron 32MB 3.2GB	899.75
333/P II 32MB 3.2GB	1139.46
350/P II 32MB 3.2GB NT	1136.42
350/P II 64 3.2GB NT	1119.80
350/P II 32MB 3.2GB	1015.99
400/P II 64MB 6.4GB NT	1249.05
450/P II 64MB 6.4GB NT	1578.33
<b>PC 300PL Series desktops</b>	
350/P II 64MB 6.4GB 32X 10/100 NT	1523.05
350/P II 32MB 4.2GB 10/100 Win 98	1369.53
400/P II 64MB 6.4GB 32X 10/100 NT	1569.62
450/P II 64MB 6.4GB 32X NT	1868.36
<b>PC 300GL Series mini-tower</b>	
333 Celeron 32MB 3.2GB Win 98	918.57
350/P II 64MB 6.4GB 32X NT	1352.36
400/P II 64MB 6.4GB 32X NT	1373.12
<b>PC 300PL Series mini-towers</b>	
350/P II 64MB 4.2GB 32X 10/100 NT	1648.57
400/P II 64MB 6.4GB 32X 10/100 NT	1693.85
450/P II 64MB 6.4GB 32X 10/100 NT	1898.56

## HEWLETT-PACKARD

<b>HP Brio Series mini-towers</b>	
300 Celeron 32MB 2.1GB 32X	799.84
333 Celeron 32MB 4.3GB 32X	898.39

333 Celeron 64MB 8GB 32X	1047.78
333 Celeron 32MB 4.3GB 32X	979.79
333/P II 32MB 4.3GB 32X	1186.95
400/P II 64MB 8GB 32X	1639.43
450/P II 64MB 8GB 32X	1798.32
<b>HP VE Series desktops</b>	
300 Celeron 32MB 3.2GB	887.46
300 Celeron 32MB 3.2GB 10/100	937.53
<b>HP VE Series mini-towers</b>	
300 Celeron 32MB 3.2GB	887.46
300 Celeron 32MB 3.2GB 32X	978.76
<b>HP VL Series desktops</b>	
333/P II 32MB 4.3GB	1387.29
450/P II 64MB 10.1GB 32X 10/100	2148.23
<b>HP VL Series mini-towers</b>	
333 Celeron 64MB 4.3GB 32X	1434.90
450/P II 64MB 6.4GB 32X	1968.47

### ACER

300/P II 32MB 4.3GB	795.95
333/P II 32MB 6.4GB 32X 10/100	1065.91
400/P II 32MB 8.4GB 32X	1298.65
266/P II 32MB 4GB 24X	1129.43
300/P II 32MB 4GB 24X	1169.15

## NOTEBOOKS

### TOSHIBA

<b>Libretto mini-notebooks</b>	
110CT 233MMX 32MB 4.3GB NT4.0	1849.96
110CT 233MMX 32MB 4.3GB Win98	1698.68
100CT 166/MMX 32MB 2GB 7.1" AM	1448.78
<b>Satellite &amp; Satellite Pro notebooks</b>	
4000CDS 233/P II 32MB 4.1GB 12.1" DS	1435.75
4000CDT 233/P II 32MB 4.1GB 12.1" AM	1596.56
4010CDS 266/P II 32MB 4.1GB 12.1" DS 24X	1498.68
4010CDT 266/P II 32MB 4.1GB 12.1" AM 24X	1798.88
4020CDT 300/P II 64MB 6.4GB 13.3" AM 24X	2649.86
<b>Tecra notebooks</b>	
8000CT 233/P II 64MB 4GB 12.1" AM 24X	2398.94
8000CT 266/P II 64MB 4GB 12.1" AM 24X	2959.89
8000CT 300/P II 64MB 6.4GB 13.3" AM 24X	3347.56
8000CT 300/P II 64MB 6.4GB 14.1" AM	3817.23

<b>Portege notebooks</b>	
3010CT 266MMX 32MB 4.3GB 10.4" AM	1697.87
7000CT 266/P II 32MB 4.3GB 12.1" AM NT	2648.98
7000CT 266/P II 32MB 4.3GB 12.1" AM	2559.89
7010CT 300/P II 32MB 4GB 12.1" AM	3098.98
7010CT 300/P II 32MB 4.3GB 12.1" AM NT	3189.99

### ACER

<b>Extensa notebooks</b>	
501DX 266MMX 32MB 3GB 12.1" DS	1237.17
502DX 266/MMX 32MB 4.1GB 12.1" DS 20X	1328.48
502T 266/MMX 32MB 4.1GB 12.1" AM 20X	1498.38
710DX 233/P II 32MB 2.1GB 12.1" DS	1529.06
710T 233/P II 32MB 3.2GB 12.1" AM	1898.94
710TE 233/P II 32MB 4.1GB 13.3" AM	2088.58
711TE 266/P II 32MB 4.1GB 13.3" AM 24X	2378.68
712TE 300/P II 64MB 6GB 13.3" AM	2838.32

### COMPAQ

<b>Prosignia 100 notebooks</b>	
233/P II 32MB 3.2GB 12.1" AM 24X	1896.56
266/P II 32MB 4GB 13.3" AM 24X	2348.58
300/P II 32MB 6.4GB 14.1" AM 24X	2799.39
<b>Armada notebooks</b>	
1700 266/P II 32MB 4GB 12.1" DS NT	1749.68
1700 233/P II 32MB 4GB 12.1" AM W98	1997.37
1700 233/P II 32MB 4GB 12.1" AM W95	1998.68
1700 233/P II 32MB 4GB 12.1" AM NT	2098.58

1700 266/P II 32MB 4GB 12.1" AM W95	2747.56
1700 266/P II 32MB 4GB 12.1" AM NT	2867.59
1700 300/P II 32MB 5GB 14.1" AM W95	3198.98
1700 300/P II 32MB 5GB 14.1" AM NT	3338.68
3500 266/P II 32MB 4.1GB 12.1" AM	2727.36
3500 266/P II 32MB 4.1GB 12.1" AM NT	2817.23
3500 300/P II 64MB 6.4GB 13.3" AM	3597.36
3500 300/P II 64MB 6.4GB 13.3" AM NT	3697.12
6500 300/P II 64MB 6.4GB 14.1" AM 24X	4087.35
6500 300/P II 64MB 6.4GB 14.1" AM 24X WNT	4167.28
7400 300/P II 64MB 6.4GB 13.3" AM 24X	4067.97
7800 266/P II 64MB 5GB 13.3" AM 20X	3497.44
7800 266/P II 64MB 5GB 13.3" AM NT	3697.12
7800 266/P II 64MB 5GB 13.3" AM 33.6K	3697.12
7800 266/P II 64MB 8GB 14.1" AM 20X	3997.56
7800 266/P II 64MB 8GB 14.1" AM NT	4267.23
7800 300/P II 64MB 8GB 14.1" AM 33.6K	4267.23
7800 266/P II 64MB 8GB 14.1" AM DVD	4657.31
7800 266/P II 64MB 8GB 14.1" AM NT	4857.96
7800 266/P II 64MB 8GB 14.1" AM 33.6K	4857.96

## HEWLETT-PACKARD

Jornada 820 Palmtop PC 16MB	899.33
OmniBook 4100 266NT 4GB 32MB	3359.69
OmniBook 2100 233/P II 32MB 4GB 24X	2155.65
OmniBook 7150 300/P II 64MB 8.1GB 14.1" AM	4797.67

### IBM

<b>ThinkPad notebooks</b>	
390 233/MMX 32MB 3.2GB 24X 12.1" AM	1696.56
390 233/P II 32MB 3.2GB 24X 12.1" AM	1897.67
390 266/P II 64MB 4.3GB 24X 14.1" AM	2449.96
380Z 233/P II 32MB 4GB 13.3" AM 24X	1828.28
380Z 300/P II 32MB 4GB 13.3" AM 24X	2348.68
380Z 300/P II 32MB 4GB 13.3" AM 24X NT	2448.58
380Z 233/P II 32MB 4GB 13.3" AM 24X NT	1929.89
560Z 233/P II 32MB 4GB 12.1" AM	2376.29
560Z 300/P II 64MB 6.4GB 12.1" AM	3288.68
600 233/P II 32MB 3.2GB 13.3" AM 24X	2738.30
600 266/P II 32MB 4GB 13.3" AM 24X	3476.56
770X 300/P II 128MB 8.1GB 13.7" AM DVD	4898.55
770X 300/P II 128MB 8.1GB 13.7" AM DVD NT	4997.67

### FUJITSU

C340 233/P II 32MB 3.2GB 12.1" DS 20X	1299.00
C350 266/P II 32MB 4GB 13" DS 20X	1599.00
E330 233/P II 32MB 3.2GB 12.1" AM W95	1779.13
E330 233/P II 32MB 3.2GB 12.1" AM W98	1774.48
E330 233/P II 32MB 3.2GB 12.1" AM NT	1967.56
E335 233/P II 32MB 3.2GB 13.3" AM W95	1896.44
E335 233/P II 32MB 3.2GB 13.3" AM W98	1896.44
E335 233/P II 32MB 3.2GB 13.3" AM NT	2085.54
E340 266/P II 32MB 4GB 13.3" AM W95	2268.98
E340 266/P II 32MB 4GB 13.3" AM W98	2268.98
E340 266/P II 32MB 4GB 13.3" AM NT	2458.68
E350 300/P II 32MB 5GB 13.3" AM W95	2549.76
E350 300/P II 32MB 5GB 13.3" AM W98	2549.76
E350 300/P II 32MB 5GB 13.3" AM NT	2738.88

## OKI<sup>®</sup>

### Okipage 12i

#### 12 ppm Digital LED page printer

- ◆ Resolution: up to 600 x 1200 dpi output
- ◆ 12 ppm print speed
- ◆ 4MB RAM standard, upgradeable to 32MB
- ◆ PCL6 and PostScript Level 2 printer language
- ◆ 5-year limited printhead warranty, 1-year Overnight Exchange warranty, toll-free 24-hour/7-day customer support



**\$599.00** CDW 138736

## Microsoft<sup>®</sup>

### Office 97



**Professional Edition With Bookshelf Basics**  
For Windows 95 and NT Workstation

Upgrade **\$309.04** CDW 78404

Full version **\$544.63** CDW 78403  
\*Call your CDW account manager for details; some restrictions apply (offer valid 1/1/99 through 7/31/99)

GET REAL

800-865-4239  
www.cdw.com



# VALUE

With more than \$1 billion in buying power, CDW will save you money. We specialize in volume purchases. Not only do you get your own CDW account manager, we have more than 60 factory-trained technicians and offer toll-free technical support for the life of your product.

**MITSUBISHI**  
DISPLAY PRODUCTS  
Innovation On Display

## Diamond Pro 900u



**19" monitor** ♦ 19"  
DIAMONDTRON™ aperture grille  
technology display, 18" viewable  
image size ♦ Truly flat CRT  
display with distortion-free image

♦ 0.25-0.27mm aperture grille dot pitch  
♦ Resolution: 1600 x 1200 at 75Hz (maximum);  
1280 x 1024 at 85Hz (recommended) ♦ Optimum  
glare and reflection control ♦ 3-year limited warranty

**\$768.71** CDW 130067

## AGFA SnapScan 1212U



### Flatbed USB scanner

♦ Resolution: 600 x 1200 dpi optical; 9600 dpi  
interpolated ♦ Flatbed, USB scanner ♦ 36-bit  
color ♦ 8.5" x 11.7" maximum scan size  
♦ Includes software: FotoLook V3.0, FotoSnap  
V3.0 and iPhotoExpress SE V3.0 ♦ 1-year  
limited warranty

**\$126.25** CDW 126555

Prosignia 200 servers	
300/P11 32MB 16X SCSI 10/100 Ethernet	1685.39
300/P11 32MB 4.3GB 16X SCSI	
10/100 Ethernet	1966.43
300/P11 64MB 4.3GB 16X 10/100 56K	4298.75
ProLiant 800 servers	
350/P11 64MB 24X 10/100 Ethernet	1674.84
400/P11 64MB 24X 10/100 Ethernet	2048.89
450/P11 64MB 24X 10/100 Ethernet	2397.54
ProLiant 1600 and 1600R servers	
300/P11 64MB no hdd 10/100 Ethernet	2579.52
300/P11 64MB 10/100 RACK	3016.30
400/P11 64MB 16X 10/100 Ethernet	2422.83
450/P11 64MB 16X 10/100 Ethernet	2839.57
ProLiant 3000 and 3000R servers	
300/P11 64MB 10/100 Ethernet	3197.64
300/P11 64MB 10/100 Ethernet rack-mount	3645.30
333/P11 64MB 10/100 Ethernet	3755.80
333/P11 64MB 10/100 Ethernet rack-mount	4197.65
400/P11 128MB 10/100 Ethernet	4382.74
450/P11 128MB 10/100 Ethernet	4719.54
450/P11 128MB 10/100 Ethernet rack-mount	5278.65
450/P11 256MB 10/100	
Ethernet 3x4GB, array model	9522.47

## HEWLETT-PACKARD

HP NetServer E50 servers	
333/P11 64MB 4.3GB	1538.86
333/P11 64MB 4.3GB	1817.93
333/P11 64MB 4.2GB	2033.45
HP NetServer LCII servers	
333/P11 64MB 24X	2199.30
HP NetServer LC III	
350/P11 64MB 24X 10/100	2336.43
350/P11 64MB 4.2GB 24X 10/100	2329.29
400/P11 64MB 24X 10/100	2589.37
400/P11 64MB 4.2GB 10/100	2857.64
450/P11 64MB 24X 10/100	2409.46
HP NetServer LH 3 servers	
6/333 P11 64MB 12X	4943.21
6/350 P11 128MB 12X rack-mount	5445.35
6/400 P11 128MB 12X	5526.62
6/400 P11 128MB 12X rack-mount	5789.37
6/450 P11 128MB rack-mount	6155.18

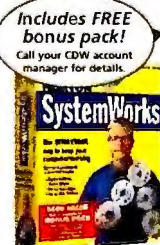
## Polaroid ColorShot

**Digital photo printer**  
Polaroid's new ColorShot  
Digital photo printer gives  
you real photographs with  
stunning sharpness and  
clarity, from your PC in  
just 15 seconds. The  
lightweight, compact ColorShot Digital Photo Printer  
delivers true, continuous-tone, fade-resistant  
photo-graphic prints.

USB **\$249.04** CDW 117319

Parallel interface **\$249.04** CDW 131723

## SYMANTEC



**\$68.86** CDW 131661

\*\$10 mail-in upgrade rebate; some  
restrictions apply (offer ends 3/31/99)

## Norton

### SystemWorks

For Windows  
95 and 98

Includes: ♦ Norton Utilities  
♦ Norton AntiVirus  
♦ Norton CrashGuard  
♦ Norton Web Services

# CDW™

Computing Solutions  
Built for Business™

**800-865-4239**  
**www.cdw.com**

©1999 CDW\* Computer Centers, Inc. 200 N. Milwaukee Avenue, Vernon Hills, IL 60061 PCW4369G 2/99

Circle 44 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

Ditto Max Professional up to 10GB int.	299.95
Ditto Max Professional up to 10GB ext.	299.95
Buz multimedia producer	199.95

## MERIDIAN DATA

8GB Snap! Server network storage attachment	928.57
16GB Snap! Server network storage attachment	1698.97
CD Net Universal 7-bay 32X CD-ROM tower	2296.92
CD NetROM 7-bay 4/24X CD-ROM tower	1308.62

## SCANNERS

Epson Expression 836XL	2499.00
Hewlett-Packard PhotoSmart photo scanner	399.00
Hewlett-Packard 6200Cse scanner	399.00
Hewlett-Packard ScanJet 5100Cse scanner	299.00
Hewlett-Packard ScanJet 6250Cse scanner	499.00
Microtek ScanMaker V310	79.95
Microtek ScanMaker X6EL scanner	228.95
Minolta Dimage Scan Dual	594.97
UMAX Astra 610S	99.00
UMAX Astra 1200S w/Photoshop LE	209.00
UMAX Mirage IIse w/MagicScan	2595.00
Umax Astra 1220S flatbed PC/Mac	179.00
Visioneer PaperPort 3100 USB flatbed	119.10
Visioneer PaperPort 6100 flatbed	187.27
Visioneer PaperPort Strobe	208.07

## PRINTERS

### EPSON

Stylus Color 440	149.00
Stylus Color 640	199.00
Stylus Color 740	279.00
Stylus Color 800	219.00
Stylus Color 850	349.00
Stylus Color 1520	499.00
Stylus Color 3000	1299.00
Stylus Photo 700	249.00
Stylus Photo EX	499.00

## HEWLETT-PACKARD

HP DeskJet 340 portable	277.08
HP DeskJet 712C color printer	199.00
HP DeskJet 722C color printer	279.00
HP DeskJet 1120Cse color printer	499.00
HP LaserJet 6Pse printer	799.00

Enter the Intel Mobile PC Sweepstakes at  
**mobile.cdw.com!**

CDW and Intel have teamed up to bring  
you a chance to win a Pentium® II  
processor-based notebook computer  
or one of many other great prizes.  
Check it out today!

Visit CDW on the Internet for  
secure online ordering, 24 hours  
a day, 7 days a week.

Contest ends 1/31/99

All products sold by CDW are third party products and are subject to the warranties and  
representations of the applicable manufacturers, including but not limited to Y2K compliance.  
Accordingly, CDW makes no representation or warranty with respect to the Y2K compliance of  
products sold.  
56K modems are capable of 56Kbps downloads, however, current regulations limit  
download speed to 53Kbps.  
Internet connectivity requires access services from an Internet access provider.  
Contact your local access provider for rates, terms and conditions.



## CDW® DIRECTORY

PC sales	800-800-4239
Mac sales	800-622-4239
Corporate sales	800-280-4239
Corporate software sales	800-294-4239
Government and Education sales	800-808-4239
Networking sales	800-377-4239

## CDW® TELEPHONE HOURS

Sales	
Monday-Friday 7 a.m.-9 p.m. CT	
Saturday 9 a.m.-5 p.m. CT	
Tech Support>Returns for Customers	
800-383-4239	
Monday-Friday 7 a.m.-9 p.m. CT	
Saturday 9 a.m.-5 p.m. CT	

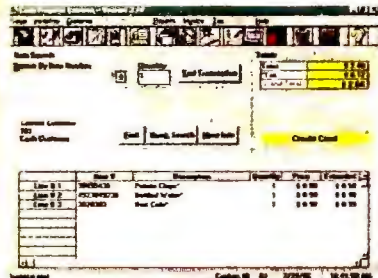
BUY WITH CONFIDENCE CDW® IS A NASDAQ® TRADED COMPANY  
TICKER SYMBOL CDWC D & B rated 5A1 Duns 10-762-7952

Credit card charges are not submitted until time of shipment. For your protection, we ship only to your credit card's verified  
billing address. Shipping and handling charges apply, please ask your CDW account manager for details. Before returning any  
product you must obtain an RMA number. Non-defective returns are subject to a restocking fee. Software, chips and other  
electronic components are not returnable. Allow 10 business days for shipping when paying by personal check. All pricing  
subject to change. For all prices, products and others, CDW reserves the right to make adjustments due to changing market  
conditions, product discontinuation, manufacturer price changes, errors in advertisements or other extenuating circumstances.  
All trademarks and registered trademarks are the sole property of their respective owners.



## 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.*



## 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](http://www.pcamerica.com)
- ◆ Fax on Demand 1-914-267-3551



**SYSTEMS  
START AT  
\$495.**

**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.

**Barcode Scanners \$495\***

Metrologic, Symbol, NJCR, Percon, PSC

**Receipt Printers \$299\***

Star, Ithaca, Citizen, Epson

**Barcode Printers \$799\***

Cognitive Solutions Barcode Blaster

**Pole Displays \$289\***

Logic Controls

# 1-800-PC-AMERICA

Call Toll Free 1-800-722-6374  
PH: 914-267-3500  
FX: 914-267-3550

PC America  
60 N. Harrison Ave.  
Congers, NY 10920

Circle 195 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



**Portable Data Collectors \$695\***  
American Microsystems AMS3000





# PC WORLD

## MARKETPLACE

SHOP  
HERE

SHOP FROM THESE  
PRODUCT CATEGORIES:

- Internet/ISPs
- Productivity
- Education/Entertainment
- Systems/Peripherals
- Memory/Upgrades
- Services/Supplies
- Recruitment

SHOPPING  
SHOWCASE

New Shopping  
Showcase at

[www.worldshopper.com](http://www.worldshopper.com)

Computer Products Plus lots more!

FOR ADVERTISING INFORMATION  
CALL TOLL FREE:

**888/254-0711**

Midwest

Randi Kalb 212/655-5170

Northwest

Maritza Alvarez 212/655-5172

Southeast

Shirley Nixon 212/655-5114

Southern California

Tom Chillemi 212/655-5156

Sales Manager/Northeast

Lisa Weseley 212/655-5137

Vice President of Sales

Neal Mandel 212/655-5157

### INTERNET/ISPs

9 Net Avenue .....	888/963-8283
Alces Group Inc. ....	406/821-4519
Hiway Tech .....	800/339-4929
Hostway .....	800/308-6845
Interland Inc. ....	404/586-9999
Online Marketing .....	800/741-6813
Web 2010 .....	843/842-9572
Worldwide Internet Publishing .....	800/756-6170

### PRODUCTIVITY

AV Marketplace .....	800/509-2602
Crichlow Data .....	800/678-4535
ICS .....	800/545-5447
MIPS Data Line .....	800/898-8560
Recycled Software .....	800/851-2425
Softcenter .....	800/752-2199
Softpro .....	800/876-7529
Worthington Data Solutions .....	800/345-4220

### EDUCATION/ENTERTAINMENT

American Institute .....	800/767-2427
At-Home Professions .....	800/388-8765
Forefront Direct .....	800/475-5831
Journey Education Marketing .....	800/874-9001
Professional Career .....	770/729-8400

Test Out .....	801/785-7900
Transcender .....	615/726-8779

### SYSTEMS/PERIPHERALS

Corporate Systems .....	408/588-1110
Granite Digital .....	510/471 6442

### MEMORY/UPGRADES

The Memory Liquidators .....	310/326-5656
------------------------------	--------------

### SERVICES/SUPPLIES

AIT .....	910/485-2383
Bear Rock Technologies .....	530/672-0244
Computer Furniture Direct .....	904/565-1163
Data Memory Systems .....	603/898-7750
Dell Computers .....	415/677-1800
Drivesavers .....	800/440-1904
EMS Global .....	509/924-6730
Microcom .....	800/469-2549
Mirror Images .....	800/322-0577
PC Innovations .....	800/774-6668
Prostep Inc. ....	904/654-4444
Quill .....	847/634-6690
Quest General Corp. ....	800/998-7431
Reiter Associates .....	800/203-5767
Sussex Information Services .....	800/336-6636
Videx .....	541/758-0521



**MORE  
TEETH**  
From Your  
**WEB HOST**

More than a mouthful from **\$19.95**  
per month!

#### FEATURES:

- Free Domain Name Registration
- 90 MB of Storage
- 3000 MB of Transfer
- 20 Email Accounts
- Email Autoresponders/Forwarding
- MS FrontPage 98 Support
- Active Server Pages
- Detailed Site Statistics
- CGI-BIN
- SSL Secure Server
- Database Hosting
- MS Access & SQL
- Complete E-Commerce Solutions
- CyberCash Shopping Cart
- Streaming Audio/Video
- Cold Fusion
- MS Index Server and Netshow
- Multiple Fiber Optic T-3's
- 99.9% Uptime Guarantee
- Same Day Setup
- 24x7 Tech Support
- Daily Tape Backup
- 30 Day Money Back Guarantee

\*Dedicated Servers Available

**World Leader in  
Microsoft NT  
Hosting**

Call:

**1-800-785-6170**

(561) 994-3600 • <http://www.wipc.net>

\*Ask about our profitable reseller programs!



Microsoft  
**FrontPage 98**

Microsoft Certified  
Solution Provider

**Worldwide Internet**  
Publishing Corp



**COPIES EVERYTHING  
PARTITIONS, O/S,  
THE WORKS!**

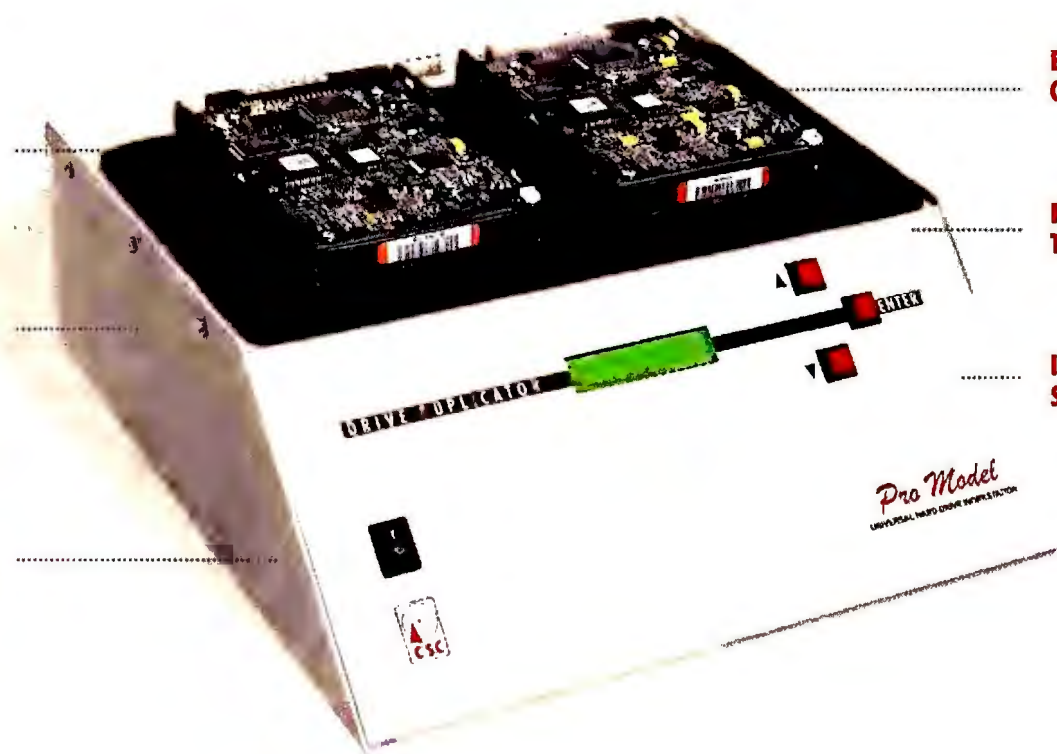
**SUPPORTS ALL INTERFACES  
SCSI, E-IDE, 2.5", SCA**

**BUILT-IN DATA  
RECOVERY SYSTEM**

**ELIMINATES DEFECTS  
ON SCSI AND IDE DRIVES**

**PARALLEL PORT PRINTS  
TEST RESULTS**

**INSTANTLY CLONES ANY  
SCSI OR IDE DRIVE**



# CLONE, TEST OR REPAIR ANY HARD DRIVE

"THE MOST COMPLETE HARD DRIVE WORKSTATION WE'VE SEEN!" BOB ROSENBLOOM, DIGITAL VIDEO, INC.

## DRIVE SERVICE STATION

Copy entire hard drives with ease. Drive duplicators are essential tools for dealers and system builders. Don't spend hours installing and formatting drives. Do it instantly with the Pro. Set up any SCSI or IDE drive with your original software. Connect blank drives to the Pro and press start. You'll copy entire drives faster and more accurately than is possible on any PC. With our combination IDE and SCSI model, you can even copy data between different interfaces. All models include both 2.5" and 3.5" interface adapters. The Pro also supports SCA and Wide SCSI drives.

Choose the Pro, and you'll also have an entire factory drive test and repair

**BUY MANUFACTURER DIRECT: \$995  
408 330-5541**

system for under \$1000. The Pro gives you the ability to copy, reformat, repair, translate, and test any hard drive. Use the Pro to put any hard drive through its paces. A full factory final test and performance analysis is performed. Complete test and repair reports are sent to any standard printer.

The Pro will also reassign and eliminate drive defects. Here's how it works: First, a precise media analysis system scans the disk for errors. Defects are mapped out, and effectively "erased." The error correcting system then "trains" the drive to permanently avoid defective areas. Data is stored only on

the safe areas of the disk. Capacity is reduced by an insignificant amount, and the drive works flawlessly once again. Get the technology used by major repair shops and data recovery centers. The Pro repairs all disk defects caused by normal wear. Drives with mechanical damage may not be repairable.



**CORPORATE SYSTEMS CENTER**  
3310 WOODWARD AVE., SANTA CLARA, CA 95054  
WWW.CORPSYS.COM

Call today for high volume multi-drive copiers and CD Duplicators  
Sold and intended for backup purposes only. Copyright laws must be observed.



# Save 65%

## Get a FREE CD-ROM!

☒ **YES!** Enter my subscription to PC WORLD and send my FREE Shareware CD-ROM! I'll pay just \$24.95 for 12 monthly issues – that's 65% off the annual newsstand rate.



Name \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

E-Mail (Optional) \_\_\_\_\_

Offer good in the US only. For delivery in Mexico, please add \$20 USD per subscription for postage. In Canada, please add \$20 for postage, plus 7% GST (#R12466980). In all other countries send \$70.95 USD to PC World, P.O. Box 55029, Boulder CO 80322-5029, USA. Savings based on US annual newsstand rate of \$71.88.



Plug into PC WORLD Online now!  
<http://www.pcworld.com>



**BUSINESS REPLY MAIL**

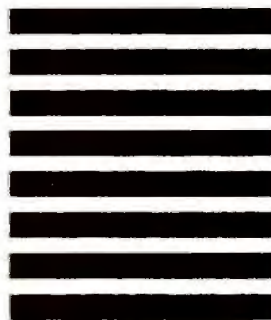
FIRST-CLASS MAIL PERMIT NO 1262 BOULDER CO

POSTAGE WILL BE PAID BY ADDRESSEE

**PC WORLD**

SUBSCRIPTION DEPARTMENT  
PO BOX 51833  
BOULDER CO 80323-1833

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES





**BOTH SINGLE AND DUAL DRIVE  
MODELS AVAILABLE.**

**MULTIMEDIA PROCESSOR  
ACCELERATES DUPLICATION.**

**EXTERNAL SCSI-II PORT WORKS  
LIKE A STANDARD CD WRITER  
FOR CREATING CUSTOM DISKS.**



**TOTALLY SELF CONTAINED,  
NO CONNECTION TO A PC  
IS REQUIRED.**

**INTERNAL A/V HARD  
DRIVE STORES DISK IMAGES  
FOR MULTIPLE COPIES, AND  
CUSTOM AUDIO DISKS.**

**ADVANCED FORMAT  
DETECTION PRODUCES  
PERFECT DUPLICATES ON  
STANDARD CD-R MEDIA.**

# COPY ANY CD INSTANTLY. NO PC REQUIRED.

## CD DUPE-IT!

Instantly duplicate CD-ROM disks for software distribution. Make backup copies of your favorite software on rugged, permanent media. Produce disks quickly and economically. No mastering or multimedia experience is required.

Insert your original disk and press "start." The multimedia processor quickly copies any disk to the internal A/V hard drive. Insert blank disks and make as many copies as you like. You'll produce identical, bit-for-bit duplicates. The system is totally self contained—no connection to a PC or Mac is required. Just

**BUY MANUFACTURER DIRECT: \$995  
408 330-5539**

plug in the power cord and press "start"—it's that easy.

You can even make your own custom audio disks without a PC! Insert your original CD's, select the tracks you want, and CD Dupe-It will copy them to the internal hard drive. Then insert a blank CD, and you'll have a custom audio disk with just the songs you want.

With the included CD mastering software, CD Dupe-It will work overtime as your personal CD mastering system. Just attach a SCSI

cable to your PC or Mac, and you're ready to design and create your own original CD's. Similar systems used in duplication houses cost over \$10,000. Now you can easily copy disks yourself for a fraction of the price.



## CORPORATE SYSTEMS CENTER

3310 WOODWARD AVE., SANTA CLARA, CA 95054  
WWW.CORPSYS.COM

Software publishers—ask about our high-volume multi-drive duplication systems.  
CD Dupe-It is sold and intended for backup and in-house design purposes only. Copyright laws must be observed.





Best  
Reseller  
Prices.

E-Commerce Enabled   Resellers, We Refer Design Work   30 Day Money Back Guarantee  
**The Best Support and Pricing in the Industry.**

Yeeehaaaaaw! It's what you'll say when you sign up with or switch to Interland® web hosting. Prices from as little as \$19.95 a month. Dual DS-3 connections for extra speed. A whopping eighty megabytes of disc space. Guaranteed 99.9% uptime. 24x7 toll-free support for the wee hours. And pricing with absolutely no hidden charges. You'll be happy, we guarantee it.

Check out our website and discover why more and more people worldwide are trusting their websites to Interland. Whether you're a computer veteran or just getting started, you'll receive the best service, support and technology the industry has to offer. At a price that's right for you. Not to mention a great reseller program. Give us a call today, and let Interland bring you the world.

**Pricing From \$19.95 per Month**

**Call Today 1-800-627-6839  
(404) 586-9999**

Speed. Reliability. Support.  
**interland®**  
Web Hosting  
[www.interland.net](http://www.interland.net)

CIRCLE 472 ON CARD OR GO TO [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

**Everyone  
hosts @  
Hiway.**

**\$15.95 for  
ExpresStart™**

**Full features  
from \$24.95**

**E-Commerce  
from \$34.95**



There are as many reasons to have a Web site as there are Web sites. But there are some things everyone wants.

**"I want it to be easy."** With Hiway™ you can order online now, and be up and running right away.

**"I want it to be fast."** Hiway uses the fastest equipment available.

**"I want it to be reliable."** Hiway guarantees 99.9% reliability. We employ redundant servers, uninterruptible power, and 24x7 technical support.

**"I want it to be affordable."** At just \$15.95 per month, Hiway's new ExpresStart service puts a Web site within reach of everyone.

With a full range of hosting plans, and the most extensive feature set in the industry, there's a reason for everyone to host at Hiway. Order online at [www.hiway.com](http://www.hiway.com)

#### Features

- ✓ 30 day money-back guarantee
- ✓ Six T3 lines to diverse backbones
- ✓ 99.9% uptime—guaranteed!
- ✓ Windows® NT hosting available
- ✓ 24x7 multilingual support
- ✓ Email included at no extra cost
- ✓ Accounts set up in a few hours
- ✓ Domains registered within hours
- ✓ One month free with 6-month contract for Plan 1 and above

Hiway hosts over 100,000 customers

Reseller Opportunities Available

**Just \$15.95 a month**

(6-month contract plus one-time setup fee.)



**Hiway  
Technologies®**

THE WORLDWIDE LEADER IN WEB HOSTING



The world  
leader in  
FrontPage®  
hosting

**(800) 339-HWAY [www.hiway.com](http://www.hiway.com) (561) 989-8574**

© 1998 Hiway Technologies, Inc. Hiway Technologies and the Hiway Technologies logo are registered trademarks and Hiway and ExpresStart are trademarks of Hiway Technologies, Inc. All other trademarks are of their respective holders.

CIRCLE 416 ON CARD OR GO TO [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)



# THE **WINNER** IN WEB SITE HOSTING!

# \$19.95

Per month with no traffic fees!

**speed**

To cross the finish line first, you need a finely-tuned machine and a team of professionals working behind the scenes to do whatever it takes to optimize performance.

**reliability**

Well, that's the way it's done at Web2010, where we host thousands of websites over the world's largest network hosting connection – the equivalent of 150 T3 lines.

**support**

With network centers on both coasts, no traffic fees and a long list of 'under the hood' web hosting & support features, it's no wonder businesses who host with us feel like winners!

- 150 T3 Lines
- No Traffic Fees
- 30 Day Money Back Guarantee
- No Setup Fee On Transferred Domains



THE WORLD'S LARGEST  
WEB HOSTING NETWORK

**1-888-WEB2010**  
**www.web2010.com**

**Call Now and Ask About Our \$2.00 Reseller Program!**



arguments stop here!

9NetAvenue!

equal opportunity hosting!

**Why** do people always argue about the best Web hosting solution? If only they knew about the rich diversity of services offered by 9NetAvenue. Whether they prefer NT or UNIX platforms, large sites or small, online commerce or not, clients are thrilled to find that 9NetAvenue can accommodate them. The answer is not to find the one solution for everyone; it is to find the one Web hosting company that can provide the answers for everyone's needs. **The answer is 9NetAvenue.**

**FULL FEATURED WEBSITE HOSTING PLANS ♦ FAST START** immediate activation \$9.95/mo. now at [www.9netave.net/faststart](http://www.9netave.net/faststart)  
 ♦ NT from \$14.95/mo. ♦ UNIX from \$14.95/mo. ♦ E-COMMERCE from \$29.95/mo. ♦ DEDICATED SERVER including hardware from \$99/mo. **ROUND-THE-CLOCK** ♦ 24x7 engineering staff ♦ 24x7 TOLL FREE multi-lingual tech support ♦ 24x7 on-premise & digital security ♦ 24x7 proactive monitoring **DATA CENTER** ♦ NEW 50,000 sq. ft. data center facility ♦ Redundant OC-12 connectivity to the Internet backbone ♦ All routing & switching by CISCO equipment ♦ Multi-terabyte back-up system ♦ Redundant UPS & Diesel Generators **CUSTOMER APPRECIATION** ♦ Park your Domain FREE ♦ 90 day money back guarantee!



9NETAVENUE

WWW.9NETAVE.NET

1 • 888 • 9NETAVE [DEDICATED HOSTING] 1 • 800 • 549 • 1140 [SHARED HOSTING] 1 • 888 • 963 • 8283 [CANADA] 1 • 888 • 260 • 7890



CIRCLE 410 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET

WE WILL NOT BE UNDERSOLD

# BRIGHT, PORTABLE, AFFORDABLE!

30 Day money  
back guarantee.\*

FREE lifetime  
1-800 tech support.

FREE loaner units  
shipped overnight.

All major brands available.  
Featuring:

**EPSON InFocus NEC  
PROXIMA SONY**

Visit online and let our  
Personal Shopper be  
your guide to selecting  
the right projector.



Featuring  
**PROXIMA®**

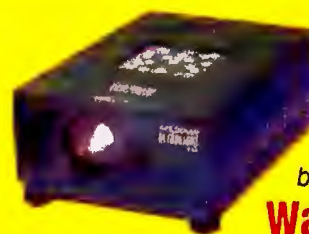


**PROXIMA DX1**  
**The High Performance  
Lightweight!**

Display visuals with dazzling clarity, thanks to 1000 lumens of brightness, DLP technology and XGA (1024 X 768) resolution! Count on compatibility with the latest laptops: PC's and Mac's. The DX1 keeps your travel load light, it weighs only 10.6 lbs., and includes a FREE laser remote and carry case for both your laptop and projector!

**Save Thousands!**  
**Call For Low Mail Order Price!**

**FREE** All projectors include  
**FREE 2 Year Warranty!**



**PROXIMA LS1**  
**Powered To Go With  
Frequent Flyer Portability!**

Hi-resolution SVGA (800 X 600). Bright,  
bold 600 lumens. Weighs only 8.4 lbs.

**Was \$5999 msrp  
Now \$4199**

**PROXIMA DP9250**  
**The High Resolution Powerhouse!**

Vivid XGA (1024 X 768) resolution in a compact,  
portable size that weighs only 13.6 lbs. Ideal  
for high-end software applications, graphics,  
spreadsheets, GIS and CAD. With 1400  
lumens of brightness, it's perfect for any room  
environment. Built-in laser pointer and mouse  
is included for flawless presenting.

**Save Thousands!**  
**Call For Low  
Mail Order Price!**



**Marketplace™**

Call Toll FREE

**888-883-7729**

\*Limitations may apply. Offers subject to change without notice

Sales • Rentals • Leasing • Repairs • Mon-Fri 8am-8pm EST. or online at [www.avmarketplace.com/proxima](http://www.avmarketplace.com/proxima)

CIRCLE 442 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET



Find it  
**fast.**  
**Buy**  
it now.



**PC WORLD**  
Marketplace

**1-800-876-4424**

Microsoft Office 97 PRO ...	\$270
Microsoft Office 97 STD ....	\$200
Microsoft Office 4.2/4.3 ....	\$199/250
Microsoft Office 98/mac ...	\$260
MS Visual Basic Pro 6 .....	\$170
Microsoft Frontpage 98 .....	\$ 85
MS Project 98 .....	\$280
MS Windows NT Server 4 .....	\$465
MS Windows NT Wrk. 4 .....	\$160
MS Word/Excel/P.P(E).....	\$140
Claris Filemaker pro 4.....	\$150
Macromedia Freehand 8.....	\$225
Macromedia Freehand G.S....	\$280
Macromedia Flash .....	\$175
Net Objects Fusion 3.0 .....	\$140
Adobe Illustrator 7 .....	\$220
Adobe Photoshop 5.0 .....	\$370
Adobe Pagemaker 6.5 .....	\$315
Adobe After Effects 3.1 .....	\$355
Adobe Acrobat 3.01 .....	\$ 80
Kai's Powertools 3 .....	\$ 90
Autocad LT 97 .....	\$320
Lotus Smart Suite 97 .....	\$ 70
Painter 5.0 .....	\$250
Final Effect 3.0 .....	\$330
Final Draft 4.1 .....	\$165
Visio IntelliCad98 .....	\$260

Soft Pro

price subject to change without notice/all  
trademark are property of their respective  
owners

**CLONING?**  
**END PC SETUP NIGHTMARES!**

**FLASHclone**

The ultimate workstation cloning and  
OS deployment tool for MIS/IT professionals

FREE DEMO AT  
flashclone.com



- Fast - Multicast** multiple machines simultaneously with the bandwidth demands of just one.
- Client Profiler** - Configure user specific settings after cloning, all from one workstation.
- Keepsafe** - Preserve user files before cloning, then auto-restore.
- Vboot** - No need to visit each client system with a floppy boot disk.
- Boot Disk Creator** - Automates making client boot floppies.
- Ghost File Converter** - Converts existing Ghost master images.

**Image MASter**

Hard drive duplication and  
diagnostic systems

- ✓ Stand-alone, portable systems.
- ✓ Data transfer speeds exceed 400MB/min!
- ✓ Mix different size and model drives in the same load.
- ✓ Extensive diagnostic features.
- ✓ 1-16 Drive systems for IDE, EIDE, Ultra-DMA, and SCSI hard drives.



Check out  
the NEW  
SOLO!



**THE BEST OF  
BOTH WORLDS!**



**Intelligent  
Computer  
Solutions**

818.885.7500

Win a Free  
Image MASter  
at  
[www.ics-iq.com](http://www.ics-iq.com)

CIRCLE 452 ON CARD OR GO TO [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

**The easiest way to set up your  
business on the Internet!**

Import your product,  
service, and pricing  
information directly  
from the storefront  
inventory database

Displays products and  
services offered

Easily add custom  
graphics and logos  
for all your products  
and services  
(GIF & JPG files)



Your customers can  
securely order your  
products or services  
with one mouse click

Automatically  
calculates order  
totals and shipping  
charges

Include an  
image or logo

Include your  
bank's address  
and logo

Include a  
memo line

Prints bank  
code line

Fill out by hand  
or on screen

Print your  
digitized  
signature

Print sequential  
check numbers



**Mips VersaCheck™ Web Commerce**

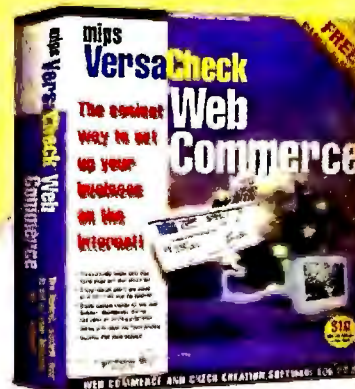
- Automatically create your own home page and Web storefront
- Accept secure check and credit-card payments over the Internet
- Create custom checks for use with Quicken, QuickBooks, Money and other accounting programs
- Works with inkjet and laser printers
- Includes 300 blank checks!

ERP **\$39.99\***

Win 3.1/95/98/NT 4.0

\*After \$10 mail-in rebate.

**New!**



**FREE  
Web Hosting  
For 60  
Days!**

Just \$9.95  
per month  
thereafter  
(First 20 MB)

Call: 800-898-8560  
[www.mipsdla.com](http://www.mipsdla.com)

Dataline America, Inc.

Tel: 619-679-4070 • Fax: 619-679-4073

**OfficeMax**  
800-788-8080

**STAPLES**  
The Office Superstore  
1-800-333-3330

**COMPUSA**  
800-COMPUSA

**Office  
DEPOT**  
Office Products at Wholesale Prices

TigerSoftware  
800-888-4437  
**MICRO CENTER**  
The Computer Superstore

**Fry's**  
ELECTRONICS

**800-800-0032**

CIRCLE 517 ON CARD OR GO TO [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

MARKETPLACE  
Shop Here! Productivity



**SoftCenter**  
America's Software Shop..

thebestplacetobuy.com

**(800) 752-2199**

<b>Adobe Pagemaker 6.5</b> full version retail box	\$345
<b>Adobe Photoshop 5.0</b> academic full version retail box	\$349
<b>Corel Wordperfect Suite 8.0 OEM</b> w/ Dragon Naturally Speaking	\$149
<b>NEW! Lotus SmartSuite Millennium</b> full version OEM	\$99
<b>MS BackOffice Small Business Server</b> 5 User OEM Package	\$899
<b>NEW! MS Home Essentials 98</b> Word 97, Encarta 98, Works 4.5, more!	\$139
<b>MS Office Pro 97</b> full version retail box	\$349
<b>MS Office Pro 97 Single User License</b> sealed MS MLP envelope	\$249
<b>MS Project 98</b> full version retail box	\$299
<b>Visual C++ Pro 6.0</b> full version retail box	\$189
<b>MS Visual Basic Pro 6.0</b> full version retail box	\$189
<b>MS Visual FoxPro 5.0</b> full version retail box	\$269
<b>MS WINDOWS 98 OEM</b> full version CD, license & manual	\$99
<b>MS Windows 98 OEM Upgrade</b> Win 98 Single User License	\$88
<b>MS Win NT Workstation 4.0 OEM</b> CD, License & Manual	\$169
<b>MS Windows NT Server</b> with 10 Client Access License	\$749
<b>MS Windows NT 4.0</b> 20 Client Access License Pack	\$349
<b>NEW! Norton AntiVirus 5.0</b> full version retail box	\$39
<b>NEW! Norton Handyman</b> includes free pocket tool	\$49
<b>NEW! Norton System Works 1.0</b> full version retail box	\$99

Visit our web site  
for dozens of other  
great software  
bargains! We offer  
live, 100% secure  
online ordering.

thebestplacetobuy.com

**SoftCenter**  
America's Software Shop..

thebestplacetobuy.com

**(800) 752-2199**

**6701 South Thayer**  
**Seattle, WA 98178**  
**Fax Us Your Bid FREE!**  
**(800) 752-2219**

Hours: Monday-Saturday  
6AM-10PM Pacific Time

RESELLERS: Visit oemsoftware.com

Major Credit Cards, CODs & POs Accepted  
CIRCLE 439 ON CARD OR WWW.PCWORLD.COM/INFONET

**WWW.BARCODEHQ.COM**

## Bar Code Labeling

### LabelRIGHT Software \$295

- Any Format, Any Label. WYSIWYG
- Formats for Sears, K-Mart, Penney's, WalMart, EIA, AIAG, etc.
- Code 128, UPC/EAN, 2 of 5, Codabar, Code 39
- Lines, Boxes, Rotations, Color, PCX, BMP, etc.
- Simple Custom Operator Interface
- Prints to LaserJet, DeskJet, and Dot-Matrix.
- DOS Version too -- only \$279

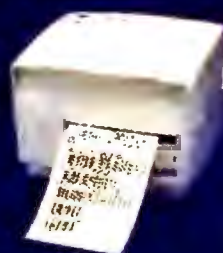


### Bar Code Fonts \$199

- For Windows and Mac
- Insert bar codes into any font based Windows program
- Prints Code 39, UPC/EAN, Code 128, PostNet, Codabar, 12 of 5
- Hotkey Desktop Translation or DLL for Programmers

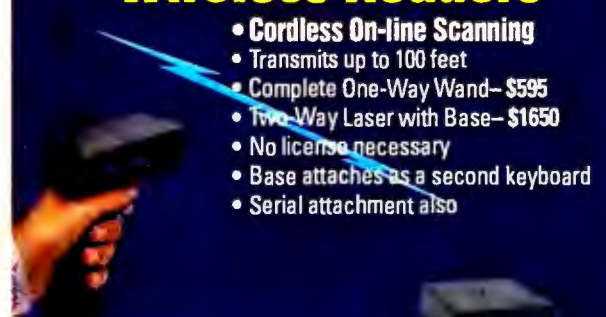
### Bar Code Printers

- Complete Package -- \$895
- Thermal Transfer Printer for Bar Codes, Text and Graphics
- Includes Windows or DOS Software, Cable, Labels and Ribbon
- Up to 4 inch label width
- High Speed and Industrial Models Available



## Wireless Readers

- Cordless On-line Scanning
- Transmits up to 100 feet
- Complete One-Way Wand -- \$595
- Two-Way Laser with Base -- \$1650
- No license necessary
- Base attaches as a second keyboard
- Serial attachment also



## Wireless Terminals

### RF Data Terminal

- 1,000 ft. Range (1,000,000 sq. ft.)
- Scan and Key Data On-line
- Computer Sends Display and Triggers Voice Messages on Terminal
- All Programming on Host (VB, C, Access, etc.)
- Bar Code Input by Wand, Laser or CCD
- Base Station -- \$845 (up to 16 Terminals)
- Complete Terminal with Wand -- \$1215
- With Integrated Laser Scanner -- \$1790



## Fixed Readers

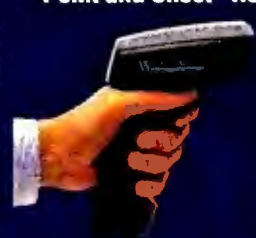
### Keyboard Wedge Wand \$299

- Attaches as second keyboard
- No software needed
- For Windows, DOS, Mac
- Code 39, UPC/EAN, 128, 2 of 5, 93, Codabar, etc.
- Wand, Laser, CCD, Slot Badge and Magstripe



### Keyboard Laser Reader \$659

- "Point and Shoot" Reading
- Decoder Built into Laser
- No extra box
- For PC and Mac
- Code 39, UPC/EAN, 128, 93, Codabar, Interleaved 2 of 5, etc.
- Lifetime Warranty on Scan Element
- Withstands 5' Drops to Concrete



### Laptop Laser Reader \$795

- Does not Draw Power from Laptop
- 4 AA Batteries in Handle or Uses Wall Power
- Attaches to DB-9 serial port
- Supplied Program makes Scanned Data Appear as Keyed

## Portable Readers

### Batch Data Collection Unit

- 64K Unit with wand \$759
- Scan and key Data to Memory
- Scan and Key Data to Battery Operated Memory (3 AAs)
- Upload collected data to host computer -- serial or keyboard
- 2 Built-in Inventory Programs
- Patented Voice Prompts
- XModem Serial Upload
- Windows and DOS Uploading Software Included at No Charge
- Easy to create custom prompts and custom voice messages.
- Cord Attached Wand, Laser or CCD



### 64K Built-in Laser Model \$1299

- Laser Scanner built-in to top
- One hand scanning
- Right hand or Left hand
- Eliminates cord and separate scanner
- Very rugged and lightweight
- Windows and DOS Uploading Software Included at No Charge
- Lifetime warranty on scan element



**Ordering is Easy! 1-800-345-4220**

Europe Phone: (353) 1 6614 566 • Fax: (353) 1 6614 622 • USA Phone: 831-458-9938 • Fax: 831-458-9964 • www.barcodehq.com

- Made in the USA
- 800 Tech Support
- 30 Day Money Back Guarantee
- 2 Year Warranty on Readers
- Free, Same Day UPS Blue Shipping
- 13 Years of service
- Widest range of Products Available
- See Website for Complete On-line Catalog

**Sales, Service and Support**  
**Direct From the Manufacturer**  
**www.barcodehq.com**

CALL FOR FREE  
CATALOG AND  
BAR CODE  
PRIMER!

**WORTHINGTON**  
**DATA SOLUTIONS**



## ADDRESS FOR SUCCESS

<http://www.aics.edu>

### Welcome to the NEW AICS Virtual Campus

- Earn B.S. and M.S. in Computer Science
- **INTRODUCING: B.S. program in Information Systems**
- Distance Education
- Object oriented B.S. program
- Approved by more than 275 companies
- Follows ACM/IEEE guidelines
- Thousands of students throughout U.S.

AMERICAN  
INSTITUTE  
COMPUTER  
SCIENCES

STATE LICENSED  
AND APPROVED

ACCREDITED:  
World Association  
of Universities  
and Colleges

FREE CATALOGUE:  
**1-800-767-AICS**  
or **www.aics.edu**

## Work at Home — Be a Medical Billing & Claims Specialist!

**EARN UP TO \$40,000 A YEAR!**

Work at home or in a medical office. No experience necessary. Work the hours you choose. Get free facts on how you can train at home for America's fastest-growing, money-making at-home career. We show you how to process medical claims for Medicare, Medicaid, private insurance. Work for doctors, hospitals, clinics. No commuting, no selling. Call toll-free or mail this ad today. No obligation!

**Call 1-800-388-8765** Dept. MVI19 or mail this ad

School of Medical Claims Processing, Dept. MVI19  
At-Home Professions, 2001 Lowe St., Fort Collins, CO 80525

CIRCLE 484 ON CARD OR GO TO [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

## What Should You Expect from a Hosting Provider?

You Should Expect  
The World

**200 MB 6 GIG**  
**13.95**

- Multiple T3 & OC3
- Your Own FTP Site
- Secure Server Access
- POP 3 Accounts
- Your Own CGI Directory
- Web Control Panel Access
- Data & Power Back-Up
- 24 x 7 On-Site Monitoring

- 99.5% Uptime
- 30 Day Money-Back
- Same Day Set-Up
- No Minimum Contract
- Free Domain Registration
- Superior Tech Support

### One stop e-commerce solutions

Includes Miva Merchant Shopping  
Cart and SSL Access, Credit Card  
Processing and Hosting!

**UNIX / NT**  
**WEB HOSTING**  
ASP Components  
MS Access  
MS SQL

### PLUS:

Reseller Program RealAudio/Video  
Dedicated Servers Miva Script  
Volano Chat

**HOSTWAY**

Expect The World.

**1.800.308.6845** **www.hostway.com**

MS FrontPage  
Extensions

CIRCLE 490 ON CARD OR GO TO [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

## Seeking Microsoft® Certification?

Meet Your Guide.

The path to Microsoft Certification is a tricky one. What you need is direction. Spike and his team of exam simulation experts can lead you through the short cuts, switchbacks and treacherous pitfalls of the Microsoft exams. Pass our exam and fail to pass Microsoft's and we'll give you your money back. Guaranteed.\* **Transcender. America's #1 Exam Preparation Software.**

- Realistic MCSE & MCSD Questions
- From \$129 - \$179
- Money Back If You Don't Pass Guarantee\*

- Detailed Answers & Explanations
- Citations to Microsoft® References
- Predictive Score Reports

To order call Spike @ (615) 726-8779 or fax (615) 726-8884 242 Louise Ave., Nashville, TN 37203 **www.transcender.com**

© 1998 Transcender Corp. All Rights Reserved. Microsoft is a registered trademark of Microsoft Corporation. Multi-user licenses are available. \*Call or see our Web site for details..



CIRCLE 513 ON CARD OR GO TO [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)



# Would You Believe This Person Is Training To Advance Their Career?

- Gain Valuable Skills, Knowledge and Technical Recognition
- Open the Door to Great Career Opportunities
- Raise Your Income
- Study at Your Own Pace
- Interactive Hands-on Exercises
- Receive One-on-One Training Consulting

## Self-Study Courses Available:

- |              |                    |              |
|--------------|--------------------|--------------|
| • MCSE       | • MCSE+Internet    | • MCP        |
| • CNE        | • Novell CIP       | • CNA        |
| • Cisco      | • UNIX             | • Networking |
| • Web Master | • A+ Certification | • PC Repair  |
| • MCSO       | • Visual Basic     | • Visual C++ |
| • Java       | • C++              | • Oracle     |
| • Office 97  | • Lotus            | • And More!  |

Discover the fastest, easiest and most convenient way to train for a high-tech career.

Our self-study computer-based training (CBT) courses allow you to study at your own pace, in a comfortable and relaxed setting of your choice.

Each course contains in-depth theory, informative graphics, hundreds of test questions and hands-on exercises for training that surpasses traditional classroom or video instruction.

**For a Free Course Catalog Call Today!**

**1-800-475-5831**

**FOREFRONT**  
**DIRECT**  
A CBT Group Company

PG

25400 US Hwy. 19 N., #285 • Clearwater, FL 33763  
800-653-4933 (727) 724-8994 Fax: (727) 726-6922

CIRCLE 477 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET

## MCSE

If you're interested in earning your Microsoft® MCSE credential, then call 1-800-877-4889 today for your free TestOut! MCSE Starter Kit! This free kit contains:



1

**Free TestOut! MCSE Exam Simulation Software** for all six MCSE exams. This software will help you learn about Microsoft's MCSE testing objectives and you'll be able to score yourself on simulated MCSE exams. It's a great way to assess your current level of knowledge in terms of Microsoft's MCSE testing objectives. You need to know where you stand!

2

**A free TestOut! MCSE Guidebook** to show you how our new self-study, multimedia TestOut! MCSE Courses on CD-ROM can help you earn your MCSE credential on a self-study basis.



© 1999 TestOut! Corporation. "TestOut!" is a trademark of TestOut! Corporation. All other trademarks are the property of their respective owners.

# FREE!

**FOR A LIMITED TIME ONLY**

**MCSE Exam Simulation Software**  
by **TestOut!**  
CORPORATION

**There's no risk to this offer.** Just call us today and we'll be happy to send you your TestOut! MCSE Starter Kit free of charge.

We're TestOut! Corporation and we're here to help you earn your MCSE credential on a self-study basis. Give us a call today!

**TestOut!** **(800) 877-4889**  
CORPORATION  
Ask for extension #395

[www.testout.com](http://www.testout.com)

TestOut! Corporation (801)785-7900 • 50 South Main • Pleasant Grove, UT 84062

CIRCLE 469 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET



# Custom **ULTRA 2 SCSI** Cables - Terminators - Cases

Ultra SCSI Performance use our Teflon Cables & Active Terminators.

Our knowledgeable SCSI Technicians will solve all your SCSI problems. guaranteed!

## SCSIView™ Active Terminator



Four models available with optional Remote LED Pak. These are the finest terminators available, they fix SCSI problems and improve reliability.

- Benefits:
- Improves SCSI Bus Performance
  - Less Errors; More Reliable Data Transfer
  - Diagnoses Problems • Analyzes Signal Quality
- Features:
- Active Regulation • Fast 50 & Fast Wide 68
  - Status Indicators • Gold Contacts

## Active 2-1 SCSI Switch / Repeater

- Benefits:
- Up to 14 Devices to 1 Computer
  - Share Devices Between 2 Computers
- Features:
- 2-1 Active Digital Switch/Repeater
  - Regenerates SCSI Signal for Long Runs

## Gold Diagnostic Adapters

- Styles: Gender Changers
- Both 50 pin and 68 pin (all combinations)
- Gender Changer
- Styles: 68 pin Drive to 50 Bus
- 68 Pin Drive to 50 Pin IDC (runs wide drive as narrow)

- Styles: 68 Pin Adapter Wide to 50 Pin Narrow
- 68 Pin External Adapter to 50 Pin (converts Host Adapter)
  - 68 Pin to 50 Pin Centronics or 50 Pin MicroD Adapters

- Styles: For Adaptec Ultra Wide Cards
- Adapters with partial termination built in for 68 to 50 converters (converts Host Adapter)

- Gender Changer
- Styles: 50 Pin Male to Male or 50 Pin Female to Female

- Styles: Custom Adapters and Connectors that match most needs. If we don't have it we can make it.

- Styles: Converts the 68 pin connector on a 68 pin cable to a 50 IDC female connector so that a 50 pin drive can be used on the 68 cable.

- Styles: Converts the 80 pin SCA type drives to be used with either 50 or 68 pin SCSI Buses. Three models available.

## Drive Bracket Kits- 3.5" to 5.25"

- We carry a variety of Brackets that allow you to mount a 3.5" drive into a 5.25" bay. They include all screw and hardware necessary. Face panels are also available. Also see our Bay Cooler Fan and Bracket Kits.

## Hot Swap Powered Terminator

- Now you can safely remove any SCSI device from a SCSI chain by simply clicking a switch. The Hot Swap Powered Terminator also has an optional Power Supply so that it can supply termination power to portable setups or when termination power is not being supplied.

## Ultra 2 (LVD) Wide Terminator

- This is the ultimate terminator on the market. It offers both Ultra 2 (LVD) operation and standard Ultra Wide or Fast Wide operation, all in one unit. Automatically senses which type of bus you are using and configures itself to that bus.

## Ultra 2 (LVD) SCA Drive Converter

- Converts an 80 pin SCA LVD (Ultra 2) drive into a standard 68 pin LVD. Has a Power Connector and SCSI ID.

## SCSIView™ Gold Diagnostic Cables

- Benefits:
- No Loss Of Important Data
  - Faster Performance
  - Test Cable Integrity
- Features:
- Diagnostic Indicators • Large Ferrite Filters
  - Triple Shielding (Unique Design)
  - Double Gold 20u" Plated Connectors
  - Extra Heavy 26 Gauge Wire • 100 Styles in Stock

## Teflon™ 90 Ohm External Cables

- Benefits:
- Ultra SCSI 40 MB/s operation
  - Fixes Ultra SCSI Cable Problems
- Features:
- Perfect 90 Ohm Impedance Match
  - Triple Pronged Connector With Gold contacts

## Gold .8mm Ultra SCSI Cables

- Benefits:
- Faster Performance
  - Test Cable Integrity
  - No Loss Of Important Data
- Features:
- New .8mm Ultra SCSI Connector
  - Triple Shielding (Unique Design)
  - Double Gold 20u" Plated Connectors
  - Diagnostic Indicators • Large Ferrite Filters

## 14 & 29 Bay Ultra SCSI Towers



- 14 & 29 Bay - The Ultimate Large SCSI Storage Solutions
- Shown with optional Bay Coolers and Dual Redundant Power Supply. Multiple SCSI Channel Support and Modular Designed Expansion.

## Temperature Alarm Systems

- Temperature is the number one cause for drive failure. Keeping the drives monitored can now easily be done. Systems include outputs for emergency additional fans and computer notification.

## Gold External Ultra SCSI Cases

- Ultra SCSI Custom Teflon Cable Available
  - Custom Enclosures in 1 Day for Raid & Arrays
- 4 Bay Tower
- 8 Bay Tower
- 2 Bay Tower
- Temperature ALARM! Automatic Monitor & Control

- The Verti 4.5" Case Kit offers a small transportable package. Ideally suited for moving around, this durable case can take a beating. Universal 35 Watt power supply.

- Optional 50 or 68 Teflon® Cables Available.
- Bay Cooler Kit keeps those HOT Ultra SCSI Drives COLD as ICE!

- HOT SWAP Pull Out Bays
- Compatible with all 50 pin & 68 pin SCSI Buses up to Fast SCSI 2.

- RACK MOUNT 8-Bay Commercial Grade Quality
- Shown with optional Bay Coolers and Dual Redundant Power Supply

- Options:
- Ultra SCSI Cable Kit
  - Dual Redundant Power Supply
  - Bay Coolers w / Brackets
  - Temperature Alarm System
  - Slide Out (400lbs rated) Rails

## Cool Dual Fan SCSI Cases

- Fast SCSI Drives get HOT...but don't worry we have the perfect solution. Our new Dual Fan SCSI Cases keep any drive cool. Temperature is a drives worse enemy.

## Granite Cables Are The Best Because They're Engineered Right.

- Granite Cables were designed by SCSI Engineers to be the **Best Cables On The Market**. Everything about them means better performance and higher reliability. Our design incorporates an exclusive shield that protects the Acknowledge and Request lines from noise. Large Ferrite beads are installed on all cables to protect them from static and noise. Every cable incorporates a LED indicator that lets you know it is operating properly. We also use more **GOLD** on every cable. Add to this our impedance matching techniques and you have most of what makes us THE BEST!

## FREE Technical Support!!!

- Available to everyone, customer or not. We will fix your SCSI problems...call us. **FREE... Color Catalog** also available Call 510-471-6442 or SEE [www.scsipro.com](http://www.scsipro.com)

## What is Ultra 2 (LVD) ? • How fast is Ultra 2 (LVD) ?

- This is the fastest SCSI available! Twice as fast as Ultra 1 SCSI and without any of its limitations. If you want true horsepower this is the Ultra SCSI system to buy. Completely backwards compatible with Ultra 1 SCSI, Fast SCSI, and SCSI 1 & 2! The key to this new SCSI Standard is the use of Low Voltage Differential Technology. Also known as (LVD) and Ultra 2 SCSI, we can now achieve speeds that far exceed even the fastest computers data throughput capabilities.

## Ultra 2 (LVD) - SCSI Repeater / Converter

- Now you can take all your SCSI devices and run them any distance you want, (up to 75 feet) while sharing the Ultra 2 SCSI bus. This revolutionary Repeater / Converter will give you, not only long cable distance, but also complete compatibility with the new Ultra 2

## Custom Teflon Internal Cables

- Benefits:
- Less Errors, Ultimate Performance
  - Silver Wire Improves Signal Quality
- Features:
- Perfect 90 Ohm Impedance • Custom in 1 Day
  - Triple Pronged Connector - Gold contacts Silver Wire

- 50 Pin Replacement Cable for External Drive Cases
- 68 Pin Replacement Cable for External Drive Cases

- 68 Pin Internal Cables, custom or stock, from 1 to 15 SCSI devices per cable. We can also make Custom 68 pin and 50 pin Combination Cables that allow you to use narrow drives on a wide cable.

Teflon® is a registered trademark of DuPont

## Active Digital SCSI Repeater

- Benefits:
- Models for all SCSI types
  - Fixes SCSI Cable Problems
- Features:
- Doubles Cable Length (up to 18')
  - Active Termination and Signal Purification
  - Ultra Fast Performance for Added Capabilities
  - Diagnostic Capabilities • 30u" Gold Contacts

## Internal Repeater

- If you integrate SCSI Raids or Arrays and are having problems making it work, the Granite SCSI Repeater will make it work. Designed to fit inside any computer or external case. These repeaters will double the cable length of any scsi bus allowing you to achieve the needed distance to make your system operate. Up to 2 repeater can be used per channel.

## SCSI Cable Tester - LED Readout

- This Digital SCSI Cable Tester can test all the popular cable styles for opens, shorts, and unreliable operation. Battery powered for easy use anywhere you need it. Three models to choose from:
- 50 pin IDC
  - 50 pin Centronics
  - 68 pin MicroD

## The Book of SCSI - An Adventure

- Considered "The Bible" of SCSI Books, it includes chapters on SCSI Basics thru Advanced SCSI. Written so that all of us can understand it, this is a reference guide that can be used by anyone. Its the best SCSI we have seen.

## SCSI PRO Utilities - SCSI Repair

- A combination of SCSI Utilities that helps you manage and diagnose SCSI problems. Allows you to set the drive for AV or Data optimization. Does custom block by block copies. Allows you to monitor SCSI operations. For Windows 3xx, 95 and NT.

## Ultra 2 (LVD) - TPO Internal Cables

- Benefits:
- Less Errors, Ultimate Performance
  - TPO Shield Improves Signal Quality
- Features:
- Perfect 132 Ohm Impedance • Custom in 1 Day
  - Triple Pronged Connector - Gold contacts Silver Wire

- 68 Pin Replacement Cable for External Drive Cases
- 68 Pin Internal Cable

- 68 Pin Internal LVD Cables, custom or stock, from 1 to 15 SCSI devices per cable. The perfect cable for LVD. We usually take just 1 to 2 days to process all orders, including custom cables!

- standard. There is no need to have two SCSI Adapters taking up precious PCI slots. Two models are available, the internal model that mounts into your enclosure, Raid/Array case, and the external that can be used anywhere.



TOP  
DOLLAR  
PAID

# MEMORY!

## BUY, SELL, TRADE, UPGRADE.

CASH BACK  
OR  
TRADE-IN

We'll **BUY** your excess or new computer memory. We **BUY** Back All Types of Memory... 72 pin, 168 pin, 30 pin, SIMMS, DIMMS, Notebook Memory. Any type of memory, working or not. Also we Buy Back working Hard Drives and CPU chips. Call us and get a price.

**ALL PRODUCTS ARE NEW AND FULLY GUARANTEED - Order from our Web Site and receive up to 10% off!**

### DIMMS (168 pin)

SDRAM - 66MHz, 100MHz, 133MHz, 10ns, 8ns	CAS LATENCY 2	PC-100	PC-100 ECC	PC-100	PC-100 ECC
8Meg	29	39	49	64 Bit	72 Bit ECC
16Meg	48	59	69	128	129/149
32Meg	108	129	109	128	129/149
64Meg	108	129	109	128	129/149
128Meg	198	239	209	249	279/299
256Meg	579	619	699	799	659/799

INDUSTRY STANDARD DIMMS	16Mg	32Mg	64Mg	128Mg	256Mg
Unbuffered	44	74	119	259	569
3.3V ECC, EDO	44	74	119	259	569
3.3V EDO	34	59	109	249	559
Buffered	44	74	119	259	569
3.3V ECC, EDO	44	74	119	259	569

### 72 PIN SIMMS (FPM, EDO)

60NS	70NS	80NS	60NS	70NS	80NS
1 x 32 4 mg	8	8	256 x 36	14	14
2 x 32 8 mg	15	15	512 x 36	3	3
4 x 32 16 mg	25	25	256 x 32	3	3
8 x 32 32 mg	46	46	512 x 32	4	4
16 x 32 64 mg	119	119	1 x 36 4 mg	14	14
1 x 32 4 mg EDO	10	10	2 x 36 8 mg	25	25
2 x 32 8 mg EDO	14	14	4 x 36 16 mg	34	34
4 x 32 16 mg EDO	22	22	8 x 36 32 mg	59	59
8 x 32 32 mg EDO	45	45	16 x 36 64 mg	169	169
16 x 32 64 mg EDO	119	119			

### MOTHERBOARDS

P-75 - P233MMX, 4PCI, 4ISA	79.00
AMD K6-2 100 MHz Bus	59.00
Pentium II, 64 Chipset, PC-100	159.00

### SIMM MODULES

	60NS	70NS	80NS
1Meg x 3 (3 chip)	4.00	4.00	4.00
1Meg x 9 (9 chip)	4.00	4.00	4.00
4Meg x 3 (3 chip)	12.00	12.00	-
4Meg x 9 (9 chip)	36.00	36.00	36.00
16Meg x 9 (9 chip)	59.00	59.00	-

### DELL MEMORY

Dimension XPS M1665, M2000, P1335, 1665, 2000, P133v, 166v, 200v (SDRAM)	16Meg/32Meg	29
Dimension XPS P60, P75, P90, P100 (pairs)	4Meg/8Meg/16Meg/32Meg	9/19/29
Dimension XPS P100, 120c, 133c, 166c, XPS P75T, 100T (pairs) FPM or EDD	4Meg/8Meg/16Meg/32Meg	9/19/29
Dimension XPS Pro 150, Pro 200 (quads)	4Meg/8Meg/16Meg/32Meg	9/19/29
Dimension XPS Pro 150n, 180n, 200n (EDO pairs)	4Meg/8Meg/16Meg/32Meg	9/19/29
Dimension XPS D233, D266, D300 (SDRAM ECC)	16Meg/32Meg/64Meg/128Meg	49/69/129/239
Digital GLX	32Meg/64Meg/128Meg	69/129/239
Digital GLX, GLM, GMT, GXM (EDO pairs)	4Meg/8Meg/16Meg/32Meg	9/19/29/49
Digital GLX, GLM, GMT, GXTM (EDO pairs)	4Meg/8Meg/16Meg/32Meg	9/19/29/49
Digital GLX, GXpro, E180, E220, E240 (EDO)	16Meg/32Meg/64Meg/128Meg	49/69/129/239
PowerEdge X100, 4100 (EDO, ECC)	16Meg/32Meg/64Meg/128Meg/256Meg	59/99/184/399/599

### GATEWAY MEMORY

Dest. Big Screen DS - SDRAM	16Meg/32Meg/64Meg	29/49
Dest. Big Screen DS - EDO (pairs)	4Meg/8Meg/16Meg/32Meg	9/19/29
ramkey PLV MMWMA - SURPOL	4Meg/8Meg/16Meg/32Meg	29/49
GS-166 200 Prof. System - SDRAM	16Meg/32Meg/64Meg	29/49
GS-166M, 200M MMWMA System - SDRAM	16Meg/32Meg/64Meg	29/49
GS-200 Prof. System - SDRAM	16Meg/32Meg/64Meg	29/49
GS-Prof. M MMWMA System - EDO	4Meg/8Meg/16Meg/32Meg	9/19/29
Multimedia G-S Systems - SDRAM	16Meg/32Meg/64Meg	29/49
Prof. P-5 Series - SDRAM	16Meg/32Meg/64Meg	29/49

### CPU CHIPS

Intel	Pro 200 256K/512K	249 450	Celeron J00-300A 333	99/189/219
Pentium II 400 MHz	575u	139	AMD	
Pentium II 400 MHz	550	129	K6-266	105
Pentium II 333 MHz	379	79/129	K6-300	129
Pentium II 333 MHz	289	59/79	K6-2-300MHz/350MHz	139/259
Pentium II 300 MHz	275	49/59	K6-2 266MHz/333MHz	105/169
Pentium II 266 MHz	229	46/54	K6-200MHz/233 MHz	89/105

### IBM APTIVA, PC, P/S1 & P/S2

Activa 300, 500 Series	4Meg/8Meg/16Meg/32Meg	11/19/29/49
Activa 2136 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
Activa 2137, 2142, 2142 (SDRAM)	16Meg/32Meg/64Meg/128Meg	39/59/109/209
Activa A, M, 300, 500, 700 Series	4Meg/8Meg/16Meg/32Meg	11/19/29/49
Activa C, S, L Series (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 330 Models 6571-6576	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 330 Model 6577 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Models 6581-6585	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6586 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6587 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Models 6588-6589 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6590 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6591 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6592 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6593 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6594 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6595 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6596 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6597 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6598 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6599 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6600 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6601 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6602 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6603 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6604 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6605 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6606 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6607 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6608 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6609 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6610 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6611 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6612 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6613 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6614 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6615 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6616 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6617 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6618 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6619 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6620 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6621 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6622 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6623 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6624 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6625 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6626 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6627 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6628 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6629 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6630 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6631 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6632 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6633 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6634 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6635 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6636 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6637 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6638 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6639 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6640 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6641 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6642 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6643 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6644 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6645 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6646 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6647 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6648 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6649 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6650 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6651 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6652 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6653 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6654 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6655 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6656 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6657 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6658 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6659 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6660 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6661 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6662 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6663 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6664 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6665 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6666 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6667 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6668 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6669 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6670 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6671 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6672 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6673 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6674 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6675 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6676 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6677 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6678 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6679 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6680 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6681 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6682 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6683 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6684 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6685 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6686 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6687 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6688 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6689 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6690 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6691 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6692 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6693 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6694 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6695 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6696 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6697 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6698 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6699 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6700 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6701 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6702 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6703 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6704 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6705 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6706 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6707 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6708 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6709 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6710 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6711 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6712 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6713 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6714 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6715 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6716 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6717 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6718 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6719 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6720 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6721 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6722 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6723 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6724 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6725 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6726 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6727 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6728 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6729 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6730 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6731 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6732 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6733 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6734 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6735 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6736 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6737 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6738 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6739 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6740 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6741 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6742 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6743 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6744 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6745 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6746 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6747 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6748 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6749 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6750 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6751 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6752 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6753 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6754 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6755 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6756 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6757 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6758 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6759 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6760 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6761 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6762 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6763 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6764 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6765 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6766 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6767 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6768 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6769 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6770 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6771 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6772 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6773 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6774 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6775 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6776 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6777 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6778 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6779 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6780 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6781 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6782 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6783 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6784 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6785 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6786 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6787 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6788 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6789 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6790 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 6791 (EDO, pairs)	4Meg/8Meg/16Meg/32Meg	11/19/29/49
PC 350 Model 67		



**DMS**  
Data Memory Systems  
800-662-7466  
Shop 24hrs. On-line  
www.datamem.com

**Best Memory Prices!**

VISA  
MasterCard  
Discover  
iomega

SAMPO  
JIMAX  
FOCUS  
ZOOM

**Lifetime Memory Replacement Guarantee**

**Pentium® Computer Systems**

**Color Monitors SVGA to 21"**

**Hard Drives / CD-ROM Drives**

**Mac or PC Display to TV Scrn. Scanners**

**56K v.90 Modems...Fax/Modems**

**Color InkJet Color Printers**

**Flatbed Color Scanners**

**Notebook Batteries**

**CPU Upgrades**

Data Memory Systems  
24 Keewagaydin Drive  
Salem, NH 03079  
Te: 603-898-7750  
Fax: 603-898-6585  
sales@datamem.com

**NEVER UNDERSOLD ON MEMORY!**  
We accept Commercial, Educational & Government P.O.s with Prior Approval

**data**

**recovery**  
www.mcrecovery.com

When you absolutely, positively have to get your data back...  
Be assured MicroCom will guide you through the recovery process...  
Diagnostic reports back to you within hours, with step-by-step updates on every recovery situation. Call now for an immediate consultation.

**MICROCOM**  
20802 Plummer St. Chatsworth, CA 91311  
818 718-1200 • 818 718-1485 fax  
**800 469-2549**

CIRCLE 466 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET

**Standard Features:**

- FREE Domain Name Registration\*  
www.yourcompany.com
- Dedicated IP Address
- 4000 sq. ft Data Center
- OC 12 Fiber Optic Multiplexer
- Up to 622 megabits per second
- Redundant T3 Backbones
- Cisco 7000 Series Router
- On-Site UPS Clean Power
- Generator Back-up System
- No Hidden Fees
- 30 day money back guarantee
- Your own ftp directory
- Your own cgi-bin
- FREE PGP Secure email available
- Unlimited POP email accounts
- Unlimited email forwarding aliases
- Unlimited Email autoresponders
- Password Protected Directories
- Easy to use Control Panel
- QuickStats web statistics and log files
- Daily Tape Backups
- FREE Marketing Newsletters
- FREE SSL Secure server access
- FREE CGI JAVA libraries
- FREE AIT Mail Listing
- FREE WebFerretPRO (\$26.00 value)
- Reseller anonymity
- Telnet access available  
(server 2,3,4,5 only)
- Cybercash supported
- Database capable
- Live Audio Video capabilities
- Chat Rooms
- 24 hour 7 day Tech Support

**InterNIC Gold Partner**  
\*Registrars like InterNIC bill separately for domain name registration.

Pre-sales questions  
1-910-485-2383  
1-910-485-3377

**ADVANCED Internet TECHNOLOGIES** **AIT Inc.**

**WEB HOSTING**

Your Hosting Solution	Frontpage	Server 1	Server 2	Server 2+	Server 3	Dedicated Server 4	Production Server 5
Disk Space	25MB	25MB	100 MB	120MB	400 MB	3.5 GB (flexible)	9 GB (flexible)
Data Transfer	4000MB	4000MB	8000 MB	8000 MB	16 GB	Subnet	Subnet
Max # of domains	N/A	N/A	25	25	75	250	1000
Base Monthly Server Cost	\$14.95	\$19.95	\$59.95	\$89.95	\$149.95	\$359.95	\$1999.95
Max. cost @ \$2.00/domain	N/A	N/A	\$50.00	\$50.00	\$150.00	\$500.00	\$2000.00
Max. monthly cost	\$14.95	\$19.95	\$109.95	\$139.95	\$299.95	\$859.95	\$3999.95
Gross profit @ \$19.95/domain	N/A	N/A	\$498.75	\$498.75	\$1,496.25	\$4,987.50	\$19,950.00
Your monthly net profit	N/A	N/A	\$388.80	\$358.80	\$1,196.30	\$4,127.55	\$15,950.05
Set-up and first month	\$53.95	\$58.95	\$108.95	\$138.95	\$244.95	\$859.95	\$4,999.95

**NEW** Server 2 PLUS offers Frontpage Extensions for resellers and AIT's new control panel for a Reseller's virtual hosts.

**NEW** **ECOMMERCE 1-2-3!**

<p>STEP 1: Build your webstore. "Put your web store on-line now FREE!" AIT's new store manager and shopping cart are standard. Why pay for your webstore?</p> <p><b>ushop</b> webstore</p>	<p>STEP 2: Establish real-time credit card transaction capability. Transaction servers, merchant accounts and gateway available to AIT customers through AIT's strategic partnership with 1st Commerce at the lowest prices in the industry.</p> <p><b>1st</b> COMMERCE</p>	<p>STEP 3: Promote your Business. Purchase and resell name brand products and services up to 30% discounted or give thousands of resellers the opportunity to resell your product and services. FREE</p> <p><b>Partnership Advantage League™</b></p>
--	---	--

Call Today **1-800-878-4084**

http://www.aitcom.net  
sales@aitcom.net

CIRCLE 514 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET





# OVER THE TOP TECHNOLOGY, BROUGHT IN UNDER BUDGET.



## Dell® OptiPlex® GX1 350 Desktop Pentium® II Processor at 350MHz

128MB Memory • 4.3GB Hard Drive • 512KB  
Cache • 32X Max<sup>^</sup> Variable CD-ROM • 16-bit  
Sound • 4MB AGP Video • 56Kbps Modem<sup>™</sup>  
• 10/100Mbps Ethernet • 17" (15.9" vis) Monitor

### \$1517

## Dell OptiPlex GX1 400 Desktop Pentium II Processor at 400MHz

128MB Memory • 6.4GB Hard Drive • 512KB  
Cache • 32X Max<sup>^</sup> Variable CD-ROM • 16-bit  
Sound • 8MB AGP Video • 56Kbps Modem<sup>™</sup>  
• 10/100Mbps Ethernet • 17" (15.9" vis) Monitor

### \$1644

## Dell OptiPlex GX1p 450 Desktop Pentium II Processor at 450MHz

128MB Memory • 10.1GB Hard Drive • 512KB  
Cache • 40X Max<sup>™</sup> Variable CD-ROM • 16-bit  
Sound • 8MB AGP Video • 56Kbps Modem<sup>™</sup>  
• 10/100Mbps Ethernet • 17" (15.9" vis) Monitor

### \$1913

## Dell Inspiron™ 3200 D266XT Notebook Pentium II Processor at 266MHz

80MB Memory • 4GB Hard Drive • 24X Max<sup>^</sup>  
Variable CD-ROM • 16-bit Sound • 13.3" XGA  
Active Matrix Display • 2MB PCI Video  
• 56Kbps Modem<sup>™</sup> • Lithium Ion Battery

### \$1896

## Dell Inspiron 3200 D266XT Notebook Pentium II Processor at 266MHz

144MB Memory • 6.4GB Hard Drive • 24X  
Max<sup>^</sup> Variable CD-ROM • 16-bit Sound  
• 13.3" XGA Active Matrix Display • 2MB PCI  
Video • 56Kbps Modem<sup>™</sup> • Lithium Ion Battery

### \$2238

## Dell Inspiron 7000 D266GT Notebook Pentium II Processor at 266MHz

128MB Memory • 8GB Hard Drive • 2X DVD-  
ROM • 16-bit Sound • 14.1" XGA Active  
Matrix Display • 8MB AGP Video • 56Kbps  
Modem<sup>™</sup> • Lithium Ion Battery

### \$2985

### Accessories (with system purchase):

harman/kardon HK-195 Speakers .....\$29

Inspiron 3200 2nd Lithium Ion Battery ....\$99

Inspiron 7000 2nd Lithium Ion Battery ..\$129

Hewlett Packard DeskJet® 722C

Color Printer .....\$299

BE DIRECT™ **DELL**

[www.dell.com/outlet/home](http://www.dell.com/outlet/home)

Welcome to Dell Refurbished, where you can buy today's technology for less. Our quality refurbished Dell computers, including desktops, notebooks, workstations and servers, are all rebuilt to original Dell specifications and feature same-as-new limited warranties and support.

**CALL NOW. SUPPLIES ARE LIMITED. 1-888-287-2816**

Mon-Fri 7am-9pm CST • Sat & Sun 10am-6pm CST • Keycode 03599



All systems refurbished. Available configurations may vary. For a copy of limited warranties, write to Dell Refurbished, 1 Dell Way - Box 65, Round Rock, TX 78682, Attn: Warranties. All sales FOB Austin. Supplies limited to stock on hand. No rain checks. Prices and specifications subject to change without notice and valid in the U.S.A. only. <sup>^</sup>40X Max/17X Min. <sup>^</sup>32X Max/14X Min. <sup>^^</sup>24X Max/10X Min. <sup>™</sup>Download speeds limited to 53Kbps. Upload speeds are less (in the 30Kbps range) and vary by modem manufacturer. Speeds also vary depending on line conditions. Analog phone line and compatible server equipment required. The Intel Inside logo and Pentium are registered trademarks of Intel Corporation. DeskJet is a registered trademark of Hewlett Packard Corporation. Dell disclaims proprietary interest in the marks and names of others. Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. ©1999 Dell Computer Corporation. All rights reserved. Printed in the U.S.A. Reproduction in any manner whatsoever without the written permission of Dell Computer Corporation is strictly forbidden. Dell cannot be responsible for errors in typography or photography.



# QUILL'S Q-TECH Discount Computer Supplies Division

Prices good through 2/28/99

Supplying businesses for more than 42 years!

**FREE CATALOG!**  
Request our  
180-page catalog!  
1-800-789-4090  
ext. 6586



**PRICE MELTDOWN!**

Quill is the largest catalog retailer of HP supplies in the country!

**HP HEWLETT PACKARD**  
Expanding Possibilities

## HP Inkjet Twin Pack & Free Software!



HP black cartridge #51626A

**ONLY 21<sup>88</sup>** each in qty.

#486-S-24281AN (Only \$43.76 per twin pack)

AFTER \$3 HP REBATE  
LIMIT: 20 TWIN PACKS PER CUSTOMER

Free software is redeemable by mail. Details in twin packs.

## HP Laser Toner Cartridge

Standard yield (6,800 pages); for 4, 4M, 4 Plus, 5, 5M and 5N printers



**ONLY 69<sup>98</sup>** each

#486-S-92298A

## HP LaserJet 4000se The Business Standard



**SPECIAL PURCHASE 949<sup>99</sup>** each PLUS SHPG.

#486-S-C4118AR WHILE SUPPLIES LAST

- Up to 17 ppm; 1200 dpi; 4 MB memory
- Enhanced HP PCL6 print language; duty cycle of up to 65,000 pages per month
- Network capable
- Paper sizes of 3x5" to 8 1/2x14"
- 54 lbs.; shipped by UPS from Quill warehouse the same day

## Iomega Zip Disks

**9<sup>99</sup>** each in qty.

#486-S-10028 (Only \$99.89 per pack of 10)



## Iomega Jaz Disks

**94<sup>88</sup>** each in qty.

#486-S-10150



**7<sup>94</sup>** each

#486-S-43347

120 mm, 90 m data tape

IMATION

**21<sup>98</sup>** each

#486-S-45577

TR-3

IMATION

IMATION

## SAVE UP TO 64% OFF LIST PRICES EVERY DAY!

### PRINTER SUPPLIES

HP Laser Toner Cartridges	
486-S-92298A	Standard capacity for 4, 5
486-S-92298X	High capacity laser toner for 4, 5
486-S-92298S	5-pack laser toner of #92298A
486-S-C3903A	Laser cartridge for 5P, 6P
486-S-C4127X	Laser cartridge for 4000
486-S-C3906A	Laser cartridge for 5L, 6L
486-S-C3909A	Laser cartridge for 5Si
HP Inkjet Cartridges	
486-S-24281AN	HP #51626A; 2-pk. inkjet ctg. w/ \$3 mail-in rebate
486-S-24282AN	HP #51629A; 2-pk. inkjet ctg. w/ \$3 mail-in rebate
486-S-24283AN	HP #51645A; 2-pk. inkjet ctg. w/ \$3 mail-in rebate
486-S-51649A	Color inkjet cartridge for 600
486-S-51641A	Color inkjet cartridge for 820

Canon Inkjet Cartridges	
486-S-8C-02	For BJ200, 210, 240
486-S-8C-05	For BJC-210, 240
486-S-8C-20	For BJC4000

Epson Inkjet Cartridges	
486-S-S020093	Black; for Stylus 400, 600
486-S-S020089	Color; for Stylus 400, 600

Lexmark Inkjet & Laser Cartridges	
486-S-1380620	4076 black inkjet cartridge
486-S-1380619	4076 color inkjet cartridge
486-S-1382920	Optra laser toner cartridge

Avery Laser Labels	
486-S-5160	1x2 1/2"; 3000 labels/box
486-S-5162	1 1/2x4"; 1400 labels/box

### DATA STORAGE

Imation	
486-S-15337	Qty. 10; CDR; 650 MB
486-S-12381	CDRW; 650 MB
486-S-LS-120	Super Disk
486-S-44797	50-pk.; 3 1/2 disk; formatted
486-S-12059	Travan NS; 8 GB
486-S-12115	Travan NS; 20 GB
486-S-45577	Travan TR3 cartridge
486-S-454560	Travan TR1 cartridge
486-S-46214	Travan TR4 cartridge
486-S-43347	4 mm tape; 120 m
486-S-42818	4 mm tape; 90 m
486-S-17374	4 mm tape; 125 m

Iomega Zip Disks & Jaz Cartridges	
486-S-10021	3-pk. Zip disks
486-S-10028	10-pk. Zip disks
486-S-10150	Jaz cartridge; 1 GB
486-S-10387	3-pk. Jaz cartridges; 1 GB
486-S-10599	Jaz cartridge; 2 GB

### PERIPHERALS

HP Inkjet Printers	
486-C4582AR	DeskJet 692C reconditioned; 600 dpi; 5 ppm; shpg. extra
486-DJ820R	DeskJet 820 reconditioned; 600 dpi; 6.5 ppm; shpg. extra
486-C4562C	DeskJet 697C; 600 dpi; 5 ppm; shpg. extra
486-C5894A	DeskJet 712C; 600 dpi; 6 ppm; shpg. extra
486-C6410B	DeskJet 895Cse; 600 dpi; 9 ppm; shpg. extra
486-C2679A	DeskJet 1120Cse; 600 dpi; 6.5 ppm; shpg. extra
486-C5900A	DeskJet 2000Cse; 600 dpi; 10 ppm; shpg. extra
486-C2686A	DeskJet 2500C; 600 dpi; 9 ppm; shpg. extra
HP Laser Printers	
486-C4118AR	LaserJet 4000se reconditioned; 1200 dpi; 17 ppm; shpg. extra
486-C4226A	LaserJet 1100; 600 dpi; 8 ppm; shpg. extra
486-C4212A	LaserJet 6Pse; 600 dpi; 8 ppm; shpg. extra

Epson Printers	
486-C255001	Stylus Color 440; 720 dpi; 4 ppm; shpg. extra
486-C256001	Stylus Color 640; 1440 dpi; 5 ppm; shpg. extra
486-C230311	Stylus Photo 700; 1440 dpi; 6 ppm; shpg. extra
486-C257001	Stylus Color 740; 1440 dpi; 6 ppm; shpg. extra
486-C251001	Stylus Color 850; 1440 dpi; 10 ppm; shpg. extra
486-C231011	Stylus PhotoEX; 1440 dpi; 11x17" print; shpg. extra
486-C211001	Stylus Color 1520; 1440 dpi; 6 ppm; shpg. extra
486-C203011PC	Stylus Color 3000; 1440 dpi; 7 ppm; shpg. extra

Iomega Zip & Jaz Drives	
486-10932	External SCSI Zip 100
486-10919	External parallel port Zip 100
486-10670	Internal ATAPI Zip 100
486-10508	External SCSI Jaz; 2 GB

HP Scanners	
486-C6292A	ScanJet 4100Cse; 36 bit; 600x1200 dpi; USB
486-C5192A	ScanJet 5100Cse; 36 bit; 600x1200 dpi; parallel
486-C6272A	ScanJet 6200Cse; 36 bit; 1200 dpi; USB/SCSI

HP CD Writer Plus	
486-C4398A	Internal 801101; 24X read; 4X write; 2X re-write

APC Back Up Units	
486-S-8K300	Back ups 300
486-S-8K500M	Back ups 500
486-S-BK650M	Back ups 650

Microsoft Keyboard & Mouse	
486-S-87500002	Natural keyboard
486-S-85471	Mouse 2.0

## BUSINESSES COUNT ON QUILL'S Q-TECH!

Simply the Best... ✓ Prices ✓ Delivery ✓ Service

See our reader service # below

### 100% Satisfaction Guaranteed

We guarantee the total Q-Tech experience will never let you down. When you do business with us, we will simply do what it takes to make it right.

### Payment Options

30 days to pay: Approved businesses can establish an open account quickly and easily. If you qualify, you'll have 30 days to pay from the time your order ships. Or charge your order.

### Easy Returns

Never a question...quick and easy. You have 30 days to return computer peripherals and software (90 days for other merchandise) to get full credit, refund or replacement.

### Fast Delivery—Usually Free!

Most stock orders in by 6 p.m. your time, ship the same day. Exclusions do apply. Ask your Q-Tech rep for details.

Due to market conditions, please call for current assortment & pricing. We make every effort to maintain our prices during to life of our ads. However, we reserve the right to revise prices, limit quantities & correct printing/pricing errors. Products not for resale. We reserve the right to refuse orders from distributors, dealers or wholesale stores.



Phone Orders: **1-800-789-1331**

Web Orders: **www.quillcorp.com/q-tech**

Mon.-Fri. 7 a.m.-9 p.m. (CST) Sat. 8 a.m.-2 p.m. (CST) • 24-hr. fax orders: 1-800-789-8955

**FREE DELIVERY** on most orders more than \$45!



**The Natural Choice In Computer Furniture.**

DELIVERED DIRECT TO YOU!

Traditional Contemporary

Classic Maple

Find just the style you want from one of five distinctive collections offered by Computer Furniture Direct. Enjoy the natural beauty of real wood in over thirty computer-savvy designs priced from \$559. We deliver and set up in your home or office. Call for your free catalog.

Shaker Mission

**1-904-565-1163**  
**www.cf-direct.com**

Please refer to ad code: pcw199

CIRCLE 423 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET

**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**

**Lost in the Crowd?**

**Shouldn't Your Web Site be a Priority?**

Your web site needs to be fast and reliable. You deserve the service to go along with it! At Reiter Associates' state of the art facilities we guarantee it. We give you the tools to make your web site *stand out in the crowd!*

**Standard Hosting**

**Features**

- ✓ 50 MB Disk Space
- ✓ SSL
- ✓ Real Audio/Video
- ✓ CGI-Bin
- ✓ 24/7 Monitoring
- ✓ FTP Access
- ✓ 2500 MB/Mo. Data Transfer
- ✓ 10 POP3 e-mail accounts
- ✓ Statistic Reporting
- ✓ Front Page Support
- ✓ Free Domain Registration\*
- ✓ Auto Responders

**19.95 /Mo.**

**REITER ASSOCIATES WEB HOSTING**  
**1.800.203.5767**  
**SALES@REITERASSOC.COM**  
**WWW.REITERASSOC.COM**

**Enhanced 44.95**  
100 MB's Disk Space  
3500 Mb's Data Transfer  
Shopping Cart  
ODBC Data Base Connectivity

**Commerce 74.95**  
150 MB's Disk Space  
10,000 Mb's Data Transfer  
Real Time Credit Card Trans.  
Shopping Cart  
ODBC Data Base Connectivity

**Priority 189.95**  
Guaranteed no more than 10 domains per server!  
Priority Support Package  
200 MB's of Disk Space  
30,000 Mb's of Data Transfer

Custom packages also available!

All Plans Include:  
round the clock support  
E-mail Accounts  
CGI-BIN

Statistical Reporting  
Auto Responders  
SSL

\* Does not include Inter Nic Fees

CIRCLE 475 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET

Why have the new **LaserLite™**, **DuraTrax™**, and **LaserLite Pro** received such outstanding reviews?

Because **metal cases** provide impressive strength and durability! You get **over 100,000 scans** from one set of batteries! And, you get **easy-to-use Windows™** software to build your application!

**Best of all—LaserLite, DuraTrax, and LaserLite Pro are uniquely affordable!**

**Videx**

Call for your free information packet today. ☎

1105 N.E. Circle Blvd., Corvallis, OR 97330  
541-758-0521 • Fax 541-752-5285 • <http://www.videx.com>

CIRCLE 480 ON CARD OR GO TO WWW.PCWORLD.COM/INFONET



BARCODE

# BAR CODE SOLUTIONS

- Bar Coding & Labeling Software
- Bar Code Font Packages
- Scanners, Lasers & Printers

UPCEAN  
CODE 39  
CODE 128  
INTERLEAVED 2of5  
POSTNET and More!



Order Your FREE Copy of  
**Bar Code Basics**  
A Guide to Using Bar Codes

Call Today for a FREE Consultation!

**800 232-7625**

Intl: (530) 672-0244 Fax: (530) 672-1103

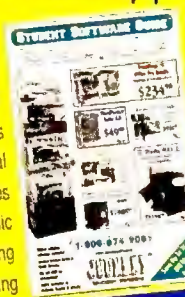
418 ON CARD OR WWW.PCWORLD.COM/INFONET

EDUCATION

## STUDENTS!

Save up to **75% OFF** popular software!

DTP  
Animation  
CAD  
Business  
Medical  
Utilities  
Music  
Programming  
Web Publishing



Adobe  
Microsoft  
Macromedia  
Autodesk  
Kinetix  
MetaCreations  
Corel  
Symantec  
Virtus  
ADAM  
Many More!!

## FREE CATALOG!

Call for a FREE Student Software Guide:

**1-800-874-9001** Ext. 98

www.JourneyEd.com

**JOURNEY**  
Education Marketing

518 ON CARD OR WWW.PCWORLD.COM/INFONET

EDUCATION

## Become a PC repair expert!

Accredited home study course. Learn how to install, upgrade, troubleshoot, and repair hardware and software. Increase your on-the-job value, or open your own PC repair business.

Send or call 24 hours a day for your free career literature.

**Call 800-223-4542**

Name \_\_\_\_\_

Age \_\_\_\_\_ Phone (\_\_\_\_) \_\_\_\_\_

Address \_\_\_\_\_

City/State \_\_\_\_\_ Zip \_\_\_\_\_

The School of PC Repair  
PCDI, 430 Technology Parkway  
Dept. JJB684, Norcross, GA 30092

451 ON CARD OR WWW.PCWORLD.COM/INFONET

**Find it  
fast.  
Buy  
it now.**



**PC WORLD**  
**Marketplace**  
[www.worldshopper.com](http://www.worldshopper.com)

INTERNET/ISPS

## OLM — SPEED • POWER • PERFORMANCE

**\$18.95/month**

### FREE EXTRAS

WWWboard installed • Graphics Counter  
Guestbook installed • Shopcart  
Free for all links page installed

### • Advanced Web Control Panel

- True Virtual Domain
- Free Secure Server Access
- 10 POP Email Boxes
- Unlimited Aliases
- Unlimited Autoresponders
- Subscribable Mail Lists
- Resellers Welcome
- 150 megs of Space
- Graphical User Stats
- FrontPage Support
- Realaudio/video
- Full cgi-bin
- HTML Script
- Dual DS3 Internet Connection

Visit [www.olm.net](http://www.olm.net) for more info  
Contact us at 877-2-OLM-NET or [sales@olm.net](mailto:sales@olm.net)

495 ON CARD OR WWW.PCWORLD.COM/INFONET

INTERNET/ISPS

## Save 50%!!

### Make Money With Your Websitel

- We will pay you to advertise on your site (no pornography)
- Market your e-mail lists

### Software Development

- Websites starting at \$100
- Online, secure e-commerce
- Custom software design
- Full time programmers will work for you from \$1000/month

### Printing

- Catalogs/brochures for as low as **2 cents per page**

Call **TODAY!!** Start making money with your website today. Start saving money printing your sales literature.!

**406-821-4519**

[www.corporateculture.com](http://www.corporateculture.com)

443 ON CARD OR WWW.PCWORLD.COM/INFONET

PRODUCTIVITY

## POINT OF SALE!

Before You Buy or Sell  
Another Point Of Sale Package,  
Take A Serious Look At



### The POS Software You Can Depend On!

- Point of Sale
- Accounts Payable
- Inventory Control
- General Ledger
- Accounts Receivable
- Mailing List

Over the past 15 years, The General Store has replaced over 40 competitive packages. The General Store is a dependable, powerful, and flexible software solution that has been installed in retail stores around the world.

Call today for more information and a **FREE DEMO**, or visit our web site at [www.thegeneralstore.com](http://www.thegeneralstore.com).



**800-678-4535**

Lakeland, FL 33801

426 ON CARD OR WWW.PCWORLD.COM/INFONET

MARKETPLACE Shop Here! Classified



## SERVICES/SUPPLIES

**DATA RECOVERY: 800-440-1904****7 good reasons to choose DriveSavers:**

©1997 DRIVESAVERS, INC.

1. We're the most trusted and respected data recovery specialists.
2. 24-hour, onsite, and weekend service available.
3. Proprietary techniques so advanced we retrieve data others might simply abandon.
4. Over 12 years of data recovery experience.
5. Certified to maintain most drive warranties.
6. Featured by CNN, NextStep, C-Net, Forbes.
7. All storage devices; DOS, Win95, WinNT, OS/2, Mac OS, UNIX, Sun, SGI, Novell.

Clip and save this ad. Visit DriveSavers at: [www.drivesavers.com](http://www.drivesavers.com)

DRIVESAVERS, INC. 400 BEL MARIN KEYS BLVD. NOVATO, CA 94949, INTL: 415-382-2000, FAX: 415-883-0780

431 ON CARD OR [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

## SOFTWARE/GENERAL

**USED SOFTWARE**

- Used IBM Compatible Software
- Save up to 50% on Current Versions
- Huge Savings on Prior Versions
- Includes Original Manuals & Disks
- Guaranteed Complete & Virus Free
- 30 Day Money Back Guarantee
- Amex, Discover, MC & VISA
- Call 7am-4pm PST M-F for Free Price List

**Recycled Software, Inc.**

PO Box 33999

Las Vegas, NV 89133-3999

**800-851-2425****702-655-5662 Fax**[www.recycledsoftware.com](http://www.recycledsoftware.com)

441 ON CARD OR [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

## SERVICES/SUPPLIES

**MAIL ORDER PROCESSING SOFTWARE**

- Order Entry
- Credit Card Processing
- UPS Manifest
- Inventory
- Mail List Management
- Advertising Tracking
- Versions under \$300

**PC INNOVATIONS**  
**1-800-774-6668**

**Shopping Fun**

Find it fast. Buy it now. Hardware, software, catalogs, gifts and much more. Go to PC World's shopping showcase:

[www.worldshopper.com](http://www.worldshopper.com)

## SERVICES/SUPPLIES

**LOSING SALES?****Accept Credit Cards NOW!**

- ✦ Home Based Businesses
- ✦ Mail Order Businesses
- ✦ Internet Merchants
- ✦ Computer Sales/Service
- ✦ Start-up Businesses
- ✦ Non-Traditional Businesses
- ✦ Credit Problems Accepted

**When Your Bank Says "No"! We Say "Yes"!****Electronic Merchant Systems - Global (EMS-Global) Offers:**

- LOW Monthly Minimum!
- LOW Rates!
- Quick Approval!
- 95% Approval!
- Equipment
- Software
- Sales/Leasing



[www.emsglobal.com](http://www.emsglobal.com)

**1-800-757-5453**

463 ON CARD OR [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

## SERVICES/SUPPLIES

**Free Report!****Network Marketing Online**

*"How to Stay Home and Get Rich through Hi-Tech, Hi-Touch Network Marketing"*



If you have a computer, online access and the desire to be your own boss, you just struck oil! Network Marketing is the hottest home-based business opportunity and Network Marketing online is making it easier than ever. Order your free report today and learn how you too can become a cyber-space millionaire right from the comfort of your own home.

Don't delay -- order your **FREE** copy today!

**1-800-656-6397** Ext. 240

<http://www.mlmpros.com/million/240/>

505 ON CARD OR [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

## SERVICES/SUPPLIES

**PRINTER SUPPLIES**

Brand name laserjet, inkjet and dot matrix cartridges and ribbons

From HP, Canon, Epson, Lexmark, Panasonic, Okidata, Apple & More

HP 4/4M/4+ toner 92298A	\$83
HP 4V/4MV toner C3900A	\$128
HP 5P/6P toner C3903A	\$68
HP 5Si toner C3909A	\$151
HP 4000/4000T C4127A	\$82
HP 4L/4P toner 92274A	\$64
Lex Optra R/RX toner 7K	\$153
Lex Optra S toner reg.	\$139

**Quest Micro**

Fax (954) 785-4416

[WWW.QUESTMICRO.COM](http://WWW.QUESTMICRO.COM)

**(800) 998-7431**

417 ON CARD OR [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

## SERVICES/SUPPLIES

**Coffee!**

Get a **FREE** Coffee Grinder at [www.northcoastcoffee.com](http://www.northcoastcoffee.com) Good prices!

419-352-6000

## SERVICES/SUPPLIES

**Profit from the Internet**

Discover the secrets to Successful Internet Marketing!

**Sussex Information Services**

has developed a proven, step by step process to starting your own Internet based business.

- Low Overhead
- Work PT from Home
- Low Start Up Cost
- Unlimited Potential

Don't let the 21st Century pass you by!

For **FREE** info email  
[sussexinfo@mailback.com](mailto:sussexinfo@mailback.com) or  
visit <http://www.sussexinfo.com>

Sussex Information Services

**1-800-336-6636**

478 ON CARD OR [WWW.PCWORLD.COM/INFONET](http://WWW.PCWORLD.COM/INFONET)

**Shopping for computer products?**

Find it fast. Buy it now. The fastest, easiest way to get your hands on exactly what you're looking for is the PC World Marketplace classified ads.



**PC WORLD**  
**Marketplace**



# 65% OFF!

**Plus, get your FREE GIFT!**

The PC WORLD FREE CD-ROM  
is loaded with great Shareware  
programs, including:

- **Modem Tools**
- **Cool Cursors**
- **Screensavers**
- **Game Demos**

And it's yours absolutely  
**FREE** with your order of  
**PC WORLD!**



**YES!** Rush me one year of PC WORLD and  
my **FREE** Shareware CD-ROM! I'll pay just \$24.95 for 12 monthly issues,  
that's 65% off the annual newsstand rate.

Name

Company

Address

City  State  Zip

E-mail (Optional)

Offer good in the US only. For delivery in Mexico, please add \$20 USD per subscription for postage. In Canada, please add \$20 USD for postage plus 7% GST (#R124669680). All other countries send \$65.97 USD to PC World, P.O. Box 55029, Boulder CO 80322-5029, USA. Savings based on annual newsstand rate of \$71.88.

4PAL4



Plug into PC WORLD Online now!  
<http://www.pcworld.com>



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**

FIRST-CLASS MAIL

PERMIT NO 1262

BOULDER CO

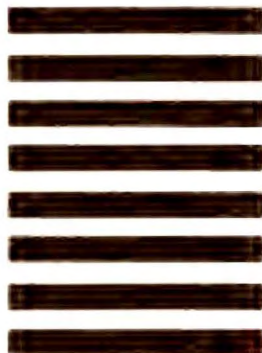
POSTAGE WILL BE PAID BY ADDRESSEE

**PC WORLD**

**SUBSCRIPTION DEPARTMENT**

PO BOX 51833

BOULDER CO 80323-1833





PC World provides readers with three easy ways to get product information. Choose from one of these options:

# FREE PRODUCT INFORMATION AT YOUR FINGERTIPS!

- **mail** Fill out the pre-paid postcard below and mail.
- **fax** Fill out form below and fax to 503/684-5370.
- **online** Visit InfoNet at [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

## PC WORLD FREE PRODUCT INFORMATION

NAME _____		
TITLE _____		
COMPANY _____		
ADDRESS _____		
CITY _____	STATE _____	ZIP _____
PHONE (     ) _____	FAX (     ) _____	
E-MAIL _____		

### INFORMATION FROM ADVERTISERS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

► **CIRCLE THE NUMBER** corresponding to the product or product category you want to know more about. Mail, fax (503/684-5370), or go online at [www.pcworld.com/infonet](http://www.pcworld.com/infonet). Manufacturers will send product information directly to you.

### PRODUCTS FEATURED IN EDITORIAL

601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

### PRODUCT CATEGORY INFORMATION

For information on all of the products mentioned in an article or an entire category of advertised products, circle the appropriate number below.

#### Editorial Features (see article for numbers)

901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920

#### Advertised Products

951 Desktop computers	956 Graphics software	961 Mail order companies
952 Notebook computers	957 Network/sharing products	962 Storage devices
953 Windows software	958 Printers	963 Web products/services
954 Monitors and video boards	959 Multimedia products	
955 Accounting software	960 Utilities	

☐ Check here for a 1-year (12 issue) subscription to PC World PLUS a free mouse pad (U.S. only). You will be billed \$24.95.

**PC WORLD** InfoNet Visit us at: [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

February 1999 This card expires June 10, 1999 51

## FREE PRODUCT INFORMATION

For a Quicker Response:

- Fax to 503/684-5370
- Or, go Online at: [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

### BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO 848 PORTLAND OR

POSTAGE WILL BE PAID BY ADDRESSEE

**PC WORLD** InfoNet

READER SERVICE DEPARTMENT  
12950 SW PACIFIC HWY STE 7  
TIGARD OR 97223-9750

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES





PC World provides readers with three easy ways to get product information. Choose from one of these options:

# FREE PRODUCT INFORMATION AT YOUR FINGERTIPS!

- **mail** Fill out the pre-paid postcard below and mail.
- **fax** Fill out form below and fax to 503/684-5370.
- **online** Visit InfoNet at [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

## FREE PRODUCT INFORMATION

For a Quicker Response:

- Fax to 503/684-5370
- Or, go Online at: [www.pcworld.com/infonet](http://www.pcworld.com/infonet)

**BUSINESS REPLY MAIL**  
FIRST-CLASS MAIL    PERMIT NO 848    PORTLAND OR

POSTAGE WILL BE PAID BY ADDRESSEE



READER SERVICE DEPARTMENT  
12950 SW PACIFIC HWY STE 7  
TIGARD OR 97223-9750

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



### PC WORLD FREE PRODUCT INFORMATION

NAME

TITLE

COMPANY

ADDRESS

CITY

STATE

ZIP

PHONE (    )

FAX (    )

E-MAIL

#### INFORMATION FROM ADVERTISERS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440
441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460
461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520

☐ Check here for a 1-year (12 issue) subscription to PC World PLUS a free mouse pad (U.S. only). You will be billed \$24.95.

► **CIRCLE THE NUMBER** corresponding to the product or product category you want to know more about. Mail, fax (503/684-5370), or go online at [www.pcworld.com/infonet](http://www.pcworld.com/infonet). Manufacturers will send product information directly to you.

#### PRODUCTS FEATURED IN EDITORIAL

601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620
621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640
641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680
681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740
741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760
761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820
821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860
861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880
881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900

#### PRODUCT CATEGORY INFORMATION

For information on all of the products mentioned in an article or an entire category of advertised products, circle the appropriate number below.

##### Editorial Features (see article for numbers)

901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

##### Advertised Products

951 Desktop computers	956 Graphics software	961 Mail order companies
952 Notebook computers	957 Network/sharing products	962 Storage devices
953 Windows software	958 Printers	963 Web products/services
954 Monitors and video boards	959 Multimedia products	
955 Accounting software	960 Utilities	

**PC WORLD InfoNet**

Visit us at: [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



**PRESIDENT, CEO** Richard J. Marino  
Assistant to the President, CEO Nancy L. Jacobs

**PUBLISHER** E. Jefferson Edman  
Business Manager Patricia Owen

## ADVERTISING SALES

**VICE PRESIDENT, ASSOCIATE PUBLISHER**  
Bob Carrigan

**ASSISTANT TO THE VICE PRESIDENT,**  
**ASSOCIATE PUBLISHER**  
Christine McGovern

**EAST**  
**DIRECTOR OF CUSTOM PUBLISHING**  
Bob Ostrow (508/370-0844)  
**ADMINISTRATIVE ASSISTANT/OFFICE MANAGER**  
Ellen Sanderson  
**New York/New Jersey/Connecticut/  
Eastern Canada**  
Wayne Silverman, Eastern  
Advertising Manager  
(201/587-0090)  
Thalia M. Karakitsios, Senior  
Account Manager (201/587-0090)  
**New England/Ohio**  
Michael Carroll, Senior Account  
Manager (508/370-0842)  
**Mid-Atlantic/Southeast/Pennsylvania**  
Judy Sutter, Senior Account  
Manager (770/394-0758)  
**Midwest**  
Kathy McKay, Senior Account  
Manager (847/827-4477)  
**East & Midwest**  
Greg Harney, Account  
Representative (508/370-0846)  
**MIDWEST/TEXAS**  
**DIRECTOR OF NATIONAL DIRECT ACCOUNTS**  
Harvey Diamond (972/398-2608)  
**ADMINISTRATIVE ASSISTANT** Janine Copsey

**NORTHWEST**  
**NORTHWEST ADVERTISING DIRECTOR**  
**Mid-S. F. Peninsula/Oregon/Washington/  
Western Canada**  
Roy Kops (415/243-0500)  
**ADMINISTRATIVE ASSISTANT**  
Alison Fennings Wetherall  
**Fremont, CA/South Bay  
(area code 408)**  
Kevin Normandeau, Senior Account  
Manager (415/243-0500)  
**San Francisco Bay Area**  
Colleen Hirner, Account Manager  
(415/243-0500)

**Northwest**  
Duane Hampson, Senior Account  
Representative (415/243-0500)

**SOUTHWEST**  
**SOUTHWEST ADVERTISING DIRECTOR**  
**Los Angeles/Orange County/  
Montana/Wyoming**  
Bill Hanck (310/312-8008)  
**ADMINISTRATIVE ASSISTANT** Joyce Clarke  
**Southern California (San Diego)/  
Colorado/Idaho/Nevada/Utah/  
New Mexico/Arizona**  
Lisa Zimmerer, Senior Account  
Manager (949/250-8081)

**Southwest**  
Shannon Smith, Account  
Representative (415/243-0500)

**CONSUMER ADVERTISING SALES**  
**DIRECTOR OF CONSUMER ADVERTISING**  
Kathy McKay (847/827-4477)  
**Eastern U.S.**  
Edman & Company (212/551-1121)  
**Michigan/Pennsylvania/Ohio**  
Heth & Associates (248/642-7273)  
**Western U.S.**  
Hutch Looney & Associates  
(323/931-3444 x227)

**PC WORLD MARKETPLACE/  
PC WORLD ACTION CARDS**  
Neal Mandel (212/655-5157)

**PC WORLD REPRINTS**  
Michelle Olk (651/582-3810)

## MARKETING

**SENIOR MARKETING MANAGER** Sandy Wong  
**PR SPECIALIST** Amy Dalton  
**PRESENTATION SPECIALIST** David Grayson  
**MARKETING COORDINATOR**  
Harriet Newman

## CIRCULATION

**VICE PRESIDENT, CIRCULATION**  
Shawne Burke Pecar  
**SUBSCRIPTION DIRECTOR**  
Ellen DiMatteo  
**DIRECTOR OF CIRCULATION OPERATIONS**  
David Cobb

**DIRECTOR, SINGLE COPY SALES**  
Cheryl Stephenson  
**BILLING AND RENEWAL MANAGER**  
Lisa Radler  
**PROMOTION MANAGERS** Judy Apostol,  
Shira Weisbach  
**MANAGER, SINGLE COPY SALES**  
Jonathan Venier  
**CUSTOMER SERVICE SPECIALIST** Shama Ali  
**CIRCULATION ADMINISTRATIVE ASSISTANT**  
Patrick McConnell

## RESEARCH

**SENIOR RESEARCH ANALYSTS**  
Sandra O'Boyle, Stephen Riddle  
**RESEARCH ASSISTANT** Karen Edson

## PRODUCTION

**VICE PRESIDENT, MANUFACTURING**  
Linda Manes Goodwin  
**PRODUCTION DIRECTOR** Nadia Maudsley  
**PRODUCTION MANAGER** Nancy Jonathans  
**AD TRAFFIC COORDINATOR**  
Lisse Hooker

## PC WORLD ONLINE

**PUBLISHER**  
Thomas Gewecke  
**VICE PRESIDENT, OPERATIONS**  
Madeleine Buckingham  
**ASSOCIATE PUBLISHER**  
Sandy Schackman  
**DIRECTOR, CIRCULATION**  
Noël McLaughlin  
**WESTERN REGIONAL ADVERTISING SALES  
MANAGER** Julie Calder  
**SOUTHWESTERN DISTRICT ADVERTISING SALES  
MANAGER** Eugenie Brown  
**EASTERN REGIONAL ADVERTISING SALES  
MANAGER** Don Calamaro  
**ACCOUNT EXECUTIVES** Gabrielle Green,  
Melissa Gruber, David Korman,  
Sean Murphy  
**ADVERTISING PRODUCTION MANAGER**  
Erin Wayman

**ASSISTANT MANAGER, ADVERTISING  
PRODUCTION** Elizabeth McGrath  
**PRODUCT MANAGER, ONLINE NEWSLETTERS**  
Declan Fox  
**INTERACTIVE CUSTOMER SERVICE MANAGER**  
Mark Green  
**BUSINESS DEVELOPMENT MANAGER**  
Ulla McGee  
**OFFICE MANAGER, BUSINESS OPERATIONS**  
Victoria Klum  
**ONLINE BUSINESS ANALYST**  
Tobias Harting  
**BUSINESS DEVELOPMENT ASSOCIATES**  
Kimberly Lyons, Rachel Payne  
**ADVERTISING SALES OPERATIONS  
COORDINATOR** Traci Shefchyk  
**MARKETING COORDINATOR** Cheryl Allen  
**MARKETING AND ADVERTISING SALES  
ASSISTANT** Adrianna Cecchini

## ADMINISTRATION

**HUMAN RESOURCES AND  
INFORMATION SYSTEMS**  
**VICE PRESIDENT** Richard Willoughby  
**DIRECTOR** Katherine Coldwell  
**REPRESENTATIVE** Christine Selfridge  
**VICE PRESIDENT, CIO** Henri Froissart  
**DIRECTOR, INFORMATION SYSTEMS**  
Norman Noble  
**NETWORK MANAGER** Rodney Barnes  
**INFORMATION SYSTEMS SPECIALISTS**  
Mario Echevarria, Stan Erhart,  
Mariaelena Robles

**FINANCE**  
**SENIOR VICE PRESIDENT, CFO** Vicki Peilen  
**EXECUTIVE DIRECTOR OF ACCOUNTING AND  
OPERATIONS** Pat Murphy  
**ACCOUNT MANAGER** Michelle Reyes  
**DIRECTOR, ADVERTISING ACCOUNT SERVICES**  
Kevin Greene  
**ADVERTISING SERVICES ADMINISTRATOR**  
Diane Hacker  
**ADVERTISING SERVICES COORDINATOR**  
Yuliya Korentsvit

PC World is a business unit of International Data Group (IDG). Headquartered in Boston, IDG informs more people worldwide about information technology than any other company in the world. With annual revenues of \$2.05 billion, IDG is the leading global provider of IT media, research, conferences, and expositions. IDG publishes more than 290 computer newspapers and magazines and 700 book titles in 75 countries, led by the *Computerworld/InfoWorld*, *Macworld*, *Network World*, *PC World*, *Channel World*, and *...For Dummies* global product lines. IDG offers online users the largest network of technology-specific sites around the world through IDG.net (www.idg.net), which comprises more than 225 targeted Web sites in 55 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 49 offices in 41 countries worldwide. Company information is available at www.idg.com.

**THE COMPANY:** IDG is the world's leading IT media, research, and exposition company. Founded in 1964, IDG had 1997 revenues of \$2.05 billion and has more than 9000 employees worldwide. IDG offers the widest range of media options, which reach 90 million IT buyers in 75 countries representing 95 percent of worldwide IT spending. IDG's diverse products and services portfolio spans six key areas including: print publishing, online publishing, expositions and conferences, market research, education and training, and global marketing services.

**PUBLICATIONS:** More than 90 million people read one or more of IDG's 290 magazines and newspapers in 75 countries each month. IDG's five global publication product lines—*Computerworld/InfoWorld*, *Macworld*, *Network World*, *PC World*, and *Channel World*—account for more than 175 of these titles, delivering a consistent class of buyers throughout the world.

**BOOKS:** IDG Books Worldwide is the fastest-growing computer book publisher in the world, with more than 700 titles in 38 languages. IDG Books Worldwide's leading brands include *...For Dummies*®, *One Step at a Time*™, *Dummies 101*™, the *...Simplified*™ series, and the *...SECRETS*® series. The *...For Dummies*® series alone, which includes more than 350 titles, has more than 50 million copies in print worldwide.

**ONLINE:** IDG offers online users the largest network of technology-specific Web sites around the world through IDG.net (www.idg.net), which comprises more than 225 targeted Web sites in 55 countries.

IDG.net provides a global gateway to the Web's richest content via highly targeted sites that reflect the distinct information needs of each audience they serve. IDG Web sites are supported by the world's only global IT news organization: 2000 journalists in 75 countries 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 information technology data, analysis, and consulting. With research centers in 41 countries and more than 400 research analysts worldwide, IDC is uniquely positioned to provide a global perspective on IT market and technology trends, serving more than 3900 corporate and government agencies worldwide. IDC/LINK is the leading provider of worldwide market research in consumer computing, including personal computing, interactive entertainment, and online services.

**EVENTS:** IDG World Expo is a leading producer of more than 168 globally branded conferences and expositions in 35 countries. Industry leading international event series include E³ (Electronic Entertainment Expo), Macworld Expo, ComNet, Windows World Expo, and ICE (Internet Commerce Expo). Leading conferences include Agenda, DEMO, and Spotlight, in addition to customer-sponsored events such as the Netscape Developers Conference. IDG produces 15 conferences and expositions in China alone, and was first to offer expos in emerging markets throughout Asia, Eastern Europe, and Latin America.

**EDUCATION:** IDG's training subsidiary, ExecuTrain, is the world's largest computer training company, with more than 230 locations worldwide and 785 training courses. ExecuTrain specializes in the education of business professionals, teaching clients how to use popular business-related software through hands-on, instructor-led, and multimedia training. ExecuTrain also offers technical training designed to help technology professionals keep pace with technological advancements, as well as custom training solutions for an organization's unique software requirements.

**MARKETING SERVICES:** IDG Marketing Services helps the industry's leading IT companies build international brand recognition by developing globally integrated marketing programs via IDG's print, online, and exposition 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.



## PC WORLD InfoNet

It's quick and easy! For free product information, visit

**www.pcworld.com/infonet**

Or you can mail or fax the PC World InfoNet reader service card included in this issue (fax: 503/684-5370).

InfoNet number

Page

### Advertiser Index A-Z

Get more information—circle the PC World InfoNet number on the reader service card.

- 3COM/Megahertz	18-19
- Adaptec, Inc.	87
11 Agfa	188
- Anthro Corporation	36
28 APC	73
45 APC	153
- ATI	40
91 Caere	235
- Canon Computer Systems	2-3
41 CDW Computer Centers, Inc.	100-101
47 CDW Computer Centers, Inc.	209
46 CDW Computer Centers, Inc.	210-211
44 CDW Computer Centers, Inc.	272-273
- Compaq Computer Corp.	55
- Compaq Consumer	24-25
35 Compaq Consumer	C2-P1
- Compaq SMB	156-165
43 CompSource	250-251
- Compuserve	220
54 Creative Labs Inc.	176A-176H
54 Creative Labs Inc.	23
50 Crucial Technology	10-11
77 CTX	111
- CyberMax Computer, Inc.	113
176 DataViz, Inc.	147
- Dell Computer Corp.	C5-C8
- Dell Computer Corp.	237-245
82 Digital Persona	183
107 Everex Systems	34
84 Executive Software	228
- Franklin Electronic Publishers	70-71
94 Fujitsu PC Corporation	44-45
27 Furniture Online	299
- Gateway	64A-64F
- Gateway	255-260
- Hewlett Packard	12-13
- Hewlett Packard	94-95
- Hewlett Packard	97
- Hewlett Packard	20
- Hughes Network Systems	186-187
- IBM Corp.	76-77
108 iiyama North America	151
119 Imation Corporation	66
98 In Focus	69
106 Internal Revenue Service	42
123 Keystone Learning Systems	226
133 Kingston Technology	166
- Lernout & Hauspie	53
141 Lexmark	37
96 LG Electronics USA Inc.	75

InfoNet number

Page

- Linux World	65
- Matrox Graphics Inc.	133
164 McAfee Software	102-103
231 Micro Warehouse	270-271
155 Micron Electronics	9
142 Micron Electronics	135-141
- Microsoft Corp.	26-27
159 Microsolutions	227
- Microtek Lab	200-201
169 Microworkz	38-39
153 Midwest Micro	229-231
57 Mindspring	131
150 Minolta	224
144 Mitsubishi Electronics America	199
203 NEC Technologies	115
- Northwest Airlines	15
- NRI Schools/McGraw Hill	181
- NRI Schools/McGraw Hill	197
181 Number Nine	32
216 NVideo	172-173
- Okidata	85
- Optique	16
225 Palo Alto Software	261
195 PC America	274
66 PC Mall	266-267
152 Plextor	149
197 QMS	63
130 Savin Corporation	28
- Sony Electronics Corporation	78-79
- Sony ITA Direct	60-61
- Sony ITA Direct	269
- Texas Instruments Digital Light Processing	83
229 Tiger Direct	300-301
234 Toshiba America	128-129
124 Toshiba America	88-91
- Tripp Lite	222
- Umax Technologies	31
248 Vega Technology	30
- Viewsonic	4-5
- Viewsonic	142
- Visio Corporation	56-57
255 Visioneer	155
254 WinBook	99

### Advertiser Index by Product Category

Get more information—circle the PC World InfoNet number on the reader service card.

#### HARDWARE

##### Boards/Cards/Chips

- 3COM/Megahertz	18-19
- ATI	40
54 Creative Labs Inc.	23

InfoNet number

Page

54 Creative Labs Inc.	176A-176H
50 Crucial Technology	10-11
133 Kingston Technology	166
- Matrox Graphics Inc.	133
181 Number Nine	32
216 NVideo	172-173
- Texas Instruments Digital Light Processing	83

##### Computers

- Adaptec, Inc.	87
41 CDW Computer Centers, Inc.	100-101
- Compaq Consumer	24-25
35 Compaq Consumer	C2-P1
43 CompSource	250-251
- CyberMax Computer, Inc.	113
- Dell Computer Corp.	237-245
- Dell Computer Corp.	C5-C8
- Gateway	255-260
- Gateway	64A-64F
231 Micro Warehouse	270-271
155 Micron Electronics	9
142 Micron Electronics	135-141
169 Microworkz	38-39
153 Midwest Micro	229-231
66 PC Mall	266-267
229 Tiger Direct	300-301
248 Vega Technology	30

##### Hand Held Devices

- Franklin Electronic Publishers	70-71
- Hewlett Packard	12-13

##### Laptop/Notebook

- Compaq Computer Corp.	55
- Compaq Consumer	24-25
43 CompSource	250-251
94 Fujitsu PC Corporation	44-45
- Gateway	255-260
- Gateway	64A-64F
231 Micro Warehouse	270-271
- Sony ITA Direct	60-61
234 Toshiba America	128-129
124 Toshiba America	88-91
- Umax Technologies	31
254 WinBook	99

##### Local Area Networks

- Hughes Network Systems	186-187
--------------------------	---------

##### Monitors/Displays

77 CTX	111
108 iiyama North America	151
144 Mitsubishi Electronics America	199
203 NEC Technologies	115
- Optique	16
- Sony ITA Direct	269
- Viewsonic	4-5

##### Multimedia

- Viewsonic	142
-------------	-----

##### Other

- Compaq SMB	156-165
98 In Focus	69
96 LG Electronics USA Inc.	75
130 Savin Corporation	28

##### Peripheral/Sharing Devices

- Hewlett Packard	20
-------------------	----

##### Power/Protection

28 APC	73
45 APC	153
- Tripp Lite	222

InfoNet number

Page

##### Printers/Plotters

- Canon Computer Systems	2-3
- Hewlett Packard	97
- Hewlett Packard	94-95
141 Lexmark	37
150 Minolta	224
- Okidata	85
197 QMS	63

##### Scanners/Digitizers

11 Agfa	188
- Microtek Lab	200-201
255 Visioneer	155

##### Server Machine

107 Everex Systems	34
- IBM Corp.	76-77

##### Storage/Backup Devices

119 Imation Corporation	66
159 Microsolutions	227
152 Plextor	149
- Sony Electronics Corporation	78-79

#### SOFTWARE

##### Graphics

- Visio Corporation	56-57
---------------------	-------

##### Management

225 Palo Alto Software	261
195 PC America	274

##### Optical Character Recognition

91 Caere	235
----------	-----

##### Other

- Lernout & Hauspie	53
---------------------	----

##### Software Suites

176 DataViz, Inc.	147
- Microsoft Corp.	26-27

##### Tax Ware

106 Internal Revenue Service	42
------------------------------	----

##### Utilities

84 Executive Software	228
164 McAfee Software	102-103

##### Video

123 Keystone Learning Systems	226
-------------------------------	-----

#### MISCELLANEOUS

##### Furniture

- Anthro Corporation	36
27 Furniture Online	299

##### Mail Order

47 CDW Computer Centers, Inc.	209
41 CDW Computer Centers, Inc.	100-101
46 CDW Computer Centers, Inc.	210-211
44 CDW Computer Centers, Inc.	272-273
153 Midwest Micro	229-231
- NRI Schools/McGraw Hill	181
- NRI Schools/McGraw Hill	197
66 PC Mall	266-267
229 Tiger Direct	300-301

##### Online Services

- Compuserve	220
57 Mindspring	131



InfoNet number	Page
<b>Other</b>	
- Northwest Airlines .....	15
<b>Security</b>	
82 Digital Persona .....	183
<b>Trade Show</b>	
- Linux World .....	65
<b>Training</b>	
123 Keystone Learning Systems .....	226
- NRI Schools/McGraw Hill .....	181
- NRI Schools/McGraw Hill .....	197

## Products Featured in Editorial

Get more information—circle the PC World InfoNet number on the reader service card.

<b>Accounting Software</b>	
- QuickBooks Pro 99, Intuit ...	81
<b>Antivirus Software</b>	
641 Command AntiVirus 4.52 ...	126
647 InDefense 2.10, Tegam International .....	126
642 McAfee VirusScan 4.0, Network Associates .....	126
643 Norton AntiVirus 5.0, Symantec .....	126
644 Panda Antivirus 6.005 Platinum .....	126
645 Sophos Anti-Virus 3.13 .....	126
646 Trend PC-cillin 6 .....	126
<b>Backup/Storage</b>	
737 Aiwa Bolt .....	82
738 Sony SuperStation .....	82
<b>Business Utility</b>	
733 Teleform 6, Cardiff Software .....	98
<b>Connecting Device</b>	
715 CamPrint, Synttran .....	92
<b>Desktop Computers</b>	
685 Acma NPower 6350 PII-350 .....	202
631 Acma ZPower 6450 PII-450 .....	193
675 Axis Systems Orion 100R PII-400 .....	202
636 Compaq Deskpro EP 6450 .....	193
679 Compaq Deskpro EP C333 .....	202
666 Compaq Presario 2266 .....	216
727 Compaq Presario 5240 .....	50
660 Compaq Presario 5600 .....	216
635 Compaq Prosignia Desktop 330 .....	193
724 Compaq Prosignia Desktop Model 310 .....	50
674 CyberMax Enthusiast KII 350 .....	202
728 CyberMax Enthusiast KII 400 .....	50
671 Dell Dimension V333C .....	202, 216
672 Dell Dimension XPS R350 .....	202

623 Dell Dimension XPS R450 .....	193, 216
620 Dell OptiPlex GX1 400 .....	193
668 Gateway E-3200 400 .....	202
624 Gateway E-4200 450 .....	193
665 Gateway G6-333C .....	216
661 Gateway G6-450 .....	216
622 Gateway GP6-450 .....	193
630 HP Brio 8500 PII-450 .....	193
725 HP Vectra VE Series 8 .....	50
633 HP Vectra VL Series 8 HE .....	193
- IBM PC 300 PL .....	193
681 IDot.com 450 BX .....	202
669 Micro Express MicroFlex C400B .....	202
670 Micro Express MicroFlex-35A .....	202
673 Micron ClientPro 400 .....	202
667 Micron Millennia 350 .....	216
621 Micron Millennia 400 Max .....	193
659 Micron Millennia 450 Max .....	216
726 Micron Millennia C366 .....	50
625 MidWest Micro Business Solutions 400 .....	193
677 MidWest Micro Office Pro 350 .....	202
638 MidWest Micro Office Pro 450 .....	193
680 NEC Direction SP B350 .....	202
627 NEC Direction SP B450 .....	193
628 NEC PowerMate 8100 .....	193
686 NextPC N6-350 PII 350 .....	202
637 NexTrend NexStar-450 PWJ .....	193
626 Polywell Poly 8450 B5 .....	193
684 PowerSpec MT 6320 PII-350 .....	202
632 Premio Apollo BX 450 .....	193
687 ProGen Polaris PII-450 .....	202
663 Quantex QP6/333 M-1c .....	216
682 Quantex QP6/400 M-2X .....	202
678 Quantex QP6/400 SM-1X .....	202
634 Quantex QP6/450 SM-4X SE .....	193
662 Sony VAIO PCV-E308DS .....	216
629 Sys Technology Performance Pro 450 .....	193
676 Sys Technology TaskMaster 350K2 .....	202
683 Unicent Avanta E333 .....	202
<b>Desktop Publishing</b>	
731 Microsoft Publisher 2000 ...	96
<b>DVD-RAM Drive</b>	
722 DVD-RAM External SCSI, LaCie .....	64
<b>DVD-ROM Drives</b>	
706 Creative Labs PC-DVD Encore 5X .....	144
707 Hi-Val DVD-3 .....	144
708 Newcom Cinema II Plus .....	144
709 Pacific Digital DCD 2X DVD-ROM .....	144
705 Sony DDU-220E/H5X DVD-ROM .....	144
<b>Graphics Boards</b>	
656 Creative Labs Graphics Blaster RIVA TNT .....	223

650 Diamond Monster Fusion PCI .....	223
655 Diamond Viper V550 .....	223
652 Guillemot Maxi Gamer Phoenix .....	223
657 Hercules Terminator Beast .....	223
649 Matrox Millennium G200 SD PCI .....	223
653 Matrox Millennium G200 .....	223
651 Metabyte Wicked3D Vengeance .....	223
648 STB Velocity 4400 PCI .....	223
654 STB Velocity 4400 .....	223
<b>Image Editing Software</b>	
750 Adobe PhotoDeluxe Business Edition .....	168
747 Adobe PhotoShop 5 .....	174
751 Corel Photo House 2.1 .....	168
748 Corel Photo-Paint 8 .....	174
752 JascPaint Shop Pro 5 .....	168
754 LivePix Soho .....	168
755 MetaCreations Kai's Photo Soap .....	168
756 MGI PhotoSuite 8.0 .....	168
749 Micrografx Picture Publisher 8 .....	174
757 Microsoft Picture It 99 .....	168
753 The Learning Company PhotoFinish 4.1 .....	168
758 Ulead PhotoImpact 4.2 .....	168
<b>Mapping Software</b>	
710 BusinessMap Pro 2.0, ESRI .....	84
711 MapPoint 2000, Microsoft .....	84
712 Quo Vadis, Marcosoft .....	84
<b>Modems</b>	
698 Amquest Host PCI 56K Dual Mode Voice/Speakerphone .....	225
701 Apache Micro Peripherals NetExpress 56K .....	225
702 Diamond Multimedia SupraExpress 56e .....	225
697 Diamond Multimedia SupraExpress 56i .....	225
703 E-Tech CyberBullet Modem E56K RVP .....	225
- IBM 56K Modem Internet Kit .....	225
704 Shark Multimedia Leopard XT-56K .....	225
699 Viking V.90 56K ISA Modem .....	225
700 Wisecom Accelerator Pro 56K Voice Fax Modem .....	225
696 Zoom FaxModem 56K PCI Dualmode .....	225
<b>Monitors</b>	
606 Cornerstone Imaging P1500 .....	221
601 Dell UltraScan P990 .....	221
- IBM P202 .....	221
602 Iiyama VisionMaster 450 .....	221
607 Iiyama VisionMaster Pro 502 .....	221
609 Princeton Caliente C2001 .....	221
604 Princeton AGX 900 .....	221

603 Sony Multiscan CDP-420GS .....	221
608 Sony Multiscan CDP-520GS .....	221
605 ViewSonic MB90 .....	221
<b>Notebook Computer</b>	
735 Dell Latitude LT M266ST ...	81
619 AMS Tech Roadster 15CTA .....	212
613 Dell Inspiron 7000 D300GT .....	212
610 Dell Latitude CPi D300XT .....	212
611 Gateway Solo 2500LS .....	212
616 Gateway Solo 2500SE .....	212
617 Gateway Solo 3100SE .....	212
618 Micron GoBook 2 266 .....	212
614 Toshiba Tecra 8000 .....	212
615 Unicent Voyager 1212 .....	212
612 Winbook XL2 .....	212
<b>Online Database Service</b>	
736 Lexis-Nexis Universe .....	82
<b>Printers</b>	
689 Canon BJC-4400 .....	218
688 Canon BJC-5000 .....	218
716 ColorShot, Polaroid .....	92
- Epson Stylus Color 1520 ...	218
- Epson Stylus Photo 700 .....	218
691 HP DeskJet 895Cse .....	218
690 Lexmark 3200 Color Jetprinter .....	218
692 Lexmark 5700 Color Jetprinter .....	218
693 Lexmark Optra SC 1275 .....	218
695 Minolta Color PageWorks PS .....	218
717 Photo Jetprinter 5770, Lexmark .....	92
694 Tally T8104 .....	218
<b>Speakers</b>	
734 Benwin Flat Panel BW2000, Benwin-Kwong Quest LLC .....	98
<b>Statistical Analysis Software</b>	
730 SPSS 9 .....	93
<b>Tax Software</b>	
720 Kiplinger TaxCut, Block Financial .....	54
- TurboTax, Intuit .....	54
<b>Telephone</b>	
639 Meridian 9617 USB, Nortel .....	41
<b>Utilities</b>	
714 NetZip Deluxe 6.3, Software Builders International .....	86
732 Norton 2000, Symantec ...	96
718 Norton Utilities, Symantec .....	247
719 Nuts & Bolts 98, Network Associates .....	247
<b>Video Capture Device</b>	
729 Dazzle Digital Video Creator .....	93
<b>Voice Recorder</b>	
713 Naturally Speaking Mobile, Dragon Systems .....	86





*"At Cisco Bootcamp we learned multi-protocol routing. Configuring IP was a bit familiar. But we also needed to configure IPX and AppleTalk, which was completely foreign to me. Through a lot of troubleshooting and working along with my teammates, we got the whole network up and running."*

*— Mark, age 17, Cisco Networking Academy student*

**There are 58 openings  
in pro basketball.**

**There are 346,000 in  
information technology.**

**You do the math.**

Basketball is a great sport. But for most kids, it's probably not a career. Information technology on the other hand is definitely a hot career choice. There are more than 346,000\* IT jobs open right now. You can help your local youth prepare for these openings through the Cisco Networking Academy program. This 280-hour program helps high school and college students develop computer networking skills that will carry them either to higher education or to their first job.

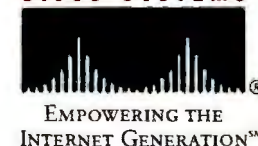
Donate equipment, fund teacher training or offer internships in your community. Your donations are fully tax-deductible to the extent allowed by the law.

Find out more. Call 1-800-CIS-4KIDS today.

Help support the  
Cisco Networking Academy Program.  
Call Communities In Schools  
at 1-800-CIS-4KIDS or  
visit [www.cisco.com/edu/pc\\_world](http://www.cisco.com/edu/pc_world)



**CISCO SYSTEMS**



\*Source: January 1998 IT Workforce Study by the Information Technology Association of America (ITAA)  
©1998 Cisco Systems, Inc. All rights reserved.



**Buy** what  
you want



- No standing in line
- No waiting on hold
- Secure order on the web

- Select from 19 product categories
- Check reviews, article awards, news reports
- Read advice from the pros from publications like PC World, PC Games, InfoWorld, MacWorld, Publish, and ComputerWorld
- Compare your favorite well known brands
- Check for the latest price and availability
- Order from well known reliable resellers in a secure environment
- Great prices

**When** you want

[www.WebShopper.com](http://www.WebShopper.com)

**Furniture  
Online.com**™

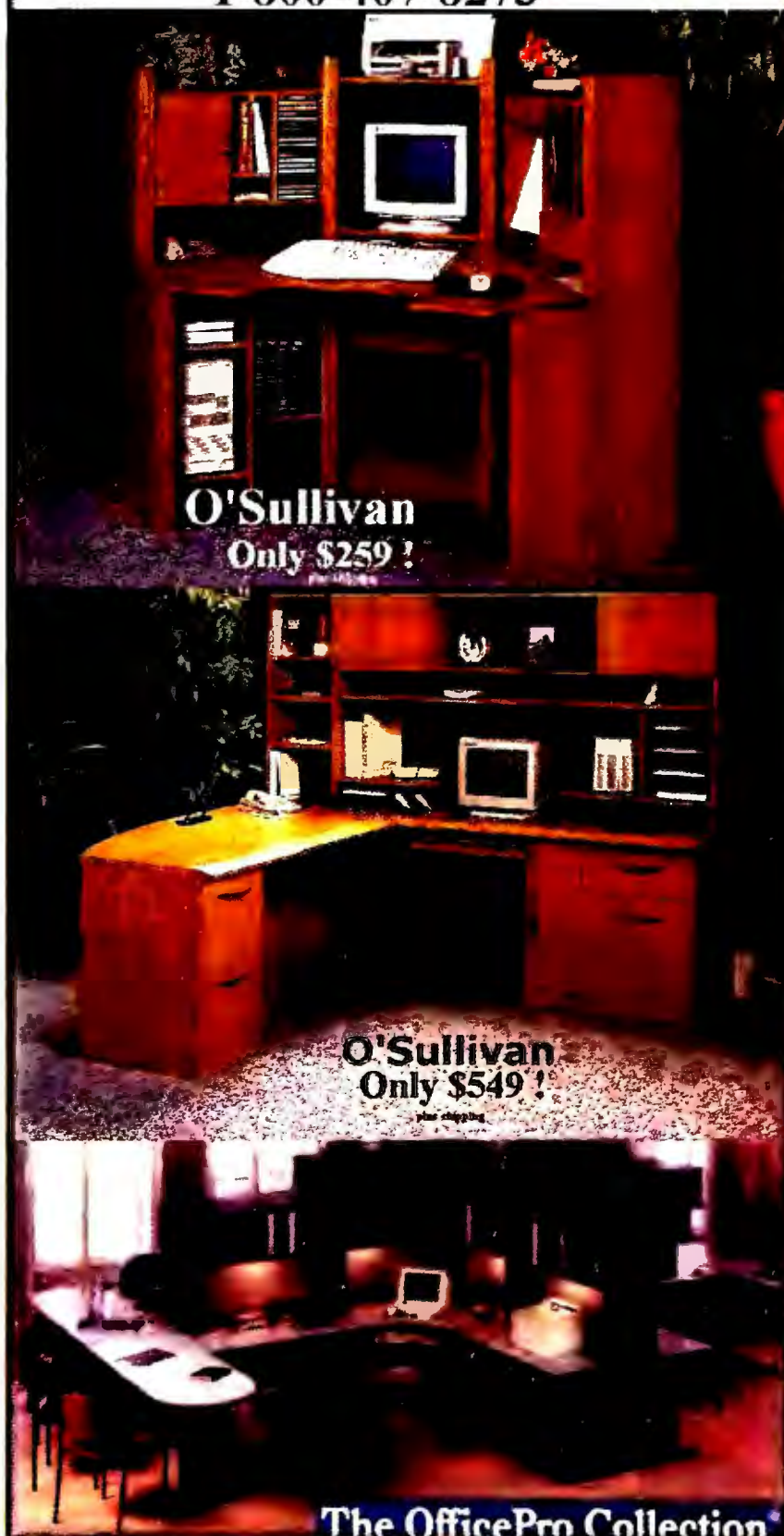
<http://www.furnitureonline.com>

Enter our online drawing for your choice of

**FREE FURNITURE !**

Come see why we are the Internet's largest office furniture dealers. We can fill your new office building or home office with quality name brands you know and trust. Bush, O'Sullivan, Orman Grubb, Bestar, Ameriwood, Gusdorf, Office Star, Gautier and more. Delivered to your office or home at unbeatable prices. We have thousands of desks, workcenters, modular office systems and office chairs to choose from. All showcased in detail online with high resolution images and specifications of the furniture. Visit Now !

**1-800-407-8273**



Circle 27 on card or go to [www.pcworld.com/infonet](http://www.pcworld.com/infonet)



# TigerSystems The Premium

TOLL-FREE

**888-222-9300**

24 HOURS A DAY! IN CANADA CALL: 800-888-6167

HARDWARE, SOFTWARE, SYSTEMS, ACCESSORIES. THE INDUSTRY'S BEST TELEPHONE SALES STAFF!

**Premium Components! Quality Craftsmanship! Top Value!**

**New!**

**AMD K6-2 400MHz**

**\$969<sup>99</sup>**

#TS3-M-14A

*"The Fastest And Most Capable Sub-\$1,000 PC Ever..."*

—Windows Magazine, August 1998

**TIGER'S SPOTLIGHT  
SYSTEM OF THE MONTH!**

**"A Hot  
System  
At A Very  
Aggressive  
Price!..."**

"Well-performing,  
well-configured sys-  
tem for small busi-  
nesses, at a rock bot-  
tom price."

Windows Magazine  
November '98

Monitor sold separately



**Editors'  
Choice**

"It's a great bargain PC with room  
to grow...Its performance numbers  
rival some Pentium II-300 systems  
we've tested..."

—Computers.com, Editor's Choice



The Tiger Family of  
PCs Awarded the  
Prestigious WIN 100  
honor! —June 1998

Pentium II 300...  
**"BEST BUY!"**

**WinLIST**  
Windows Magazine 1998

"Quality construction and top-level  
components at a low price..."

Windows Magazine, April '98

...On the Pentium 200 MMX...  
"An office tool you'll respect."  
PC Computing, May '98



"Competitive features and  
performance from the first  
PII-400 on the budget chart."  
PC World, September '98

The Tiger Professional Line Custom Configurations Available!

**AMD K6-2 300MHz**

64MB Premium-Speed PC100 SDRAM Memory  
6.4 Gigabyte UDMA Hard Drive  
17-Inch Tiger Monitor (.28mm Dot Pitch) Viewable: 15.8"  
32-Speed CD-ROM Drive, 1.44MB Floppy Drive  
AGP 3D Video w/8MB RAM  
56K V.90 PCI Modem (With Fax & Voice)  
Yamaha Wave Table 3D Sound card, Boom Microphone  
Amplified Stereo Speakers  
6-Bay Case With 235-Watt Power Supply  
Case Features Tiger-Exclusive 4-cooling fan design  
Microsoft Windows 98 Pre-Installed and ready to run!  
Windows 98 Premium Keyboard  
Microsoft IntelliMouse

**"BEST BUY!"**

Windows Magazine, April '98  
**WinList**

**TigerLEASE**

**\$32/mo.**

**LOWEST  
PRICES  
GUARANTEED!**

**\$899<sup>99</sup>**

Order # **CTLTM17**  
INCLUDES 17" MONITOR!

**TOLL-FREE TECHNICAL SUPPORT**

**OTHER VALUES (All Including 17" Monitors)**

CPU Type	Speed	Memory	HD	Price	Part #
AMD K6-2	300MHz	64MB	6.4GB	\$899.99	(CTLTM17)
Cyrix MII	333	64MB	8.4GB	\$914.99	(CTLTM23)
AMD K6-2	333MHz	96MB	10.2GB	\$1019.99	(CTLTM26)
Intel Pentium II	350MHz	64MB	6.4GB	\$1089.99	(CTLTM35)
AMD K6-2	400MHz	128MB	10.2GB	\$1129.99	(CTLTM37)
Intel Pentium II	400MHz	96MB	10.2GB	\$1339.99	(CTLTM12)
Intel Pentium II	450MHz	128MB	10.2GB	\$1589.99	(CTLTM29)

The Tiger Small Office Line Feature System Exceptional Value!

**Cyrix MII 300 Systems**

64MB High-Speed SDRAM  
4.3 Gigabyte UDMA Hard Drive  
24-Speed CD-ROM Drive  
15-Inch Tiger Monitor (.28mm Dot Pitch) Viewable: 13.9"  
64-Bit 3D Video With 4MB RAM  
56K V.90 FaxModem  
Wave Table 3D Sound Onboard, Boom Microphone  
Amplified Stereo Speakers

9-Bay Case/200-Watt Power Supply  
1.44MB Floppy Drive  
Microsoft Windows 98  
Pre-Installed  
Premium 104-key Windows  
Keyboard  
And PS/2 Mouse  
TOLL-FREE TECHNICAL SUPPORT

**TigerLEASE**  
**\$25/mo.**

**\$699<sup>99</sup>**

Part # **CTLTM28**  
INCLUDES 15" MONITOR

**OTHER GREAT PC VALUES  
(All Include 15" Monitors)**

AMD K6-2 300 MHz	\$739.99	(CTLTM30)
Cyrix MII 300	\$699.99	(CTLTM28)

10 Years In The PC Business!

**"THE TOP-DRAWER  
COMPONENT SYSTEMS."** Windows  
Magazine, April '98



**Why Buy A TigerSystems PC...**

- On-Site Set-Up, Installation And Training Available By Dow Jones Technicians!
- We Make Our Systems Easy To Own With...
- We Provide An Ironclad Guarantee!  
Plus Toll-Free 800 Phone Technical Support!

**Attention Corporate, Government  
And Educational Buyers:**

Our Business-to-Business Division is ready to  
serve your needs with volume discounts on  
hardware and software. Call your dedicated  
account representative at 888-278-4437.

**TigerSystems**

**MONITOR UPGRADES**

**Upgrade Your Display When You Order!**

Tell Your Sales Agent

To **"SUPER-SIZE" Your Monitor—And Save!**

Upgrade From 15-inch TO 17-inch ..... \$110.00

Upgrade From 15-inch TO 19-inch ..... \$370.00

Upgrade From 17-inch TO 19-inch ..... \$260.00

Sorry, but as prices are always changing on CPUs and memory, we do not offer price protection in the event prices rise or fall. Prices and configurations subject to change. Not responsible for typographical errors. All prices are in U.S. dollars. Systems include a one-year upgradable warranty.

Please see our warranty policy on the Web: [www.tigerdirect.com/warranty](http://www.tigerdirect.com/warranty)



# Component PC Systems!

Now you can shop with us ON-LINE! [www.tigerdirect.com](http://www.tigerdirect.com)

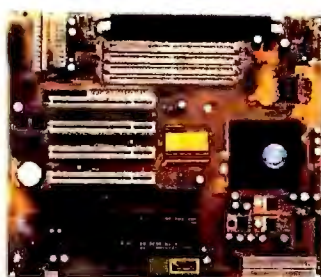
## TIGER'S DO-IT-YOURSELF CENTER

Purchase Motherboards Alone, With A Case, Or As A Complete Kit. Outstanding Prices.

### Tiger 571 AT Motherboard

**Motherboard & Case:** Motherboard mounted in dual-cooling fan case; 200 Watt power supply, cable & manual. Sound and video.

**Pre-Assembled Kits:** Motherboard in dual-cooling fan case; 200 Watt power supply, keyboard, speakers, mouse, microphone, 56KFlex fax/modem, 1.44MB floppy drive, 24X CD-ROM. Sound and video on board.



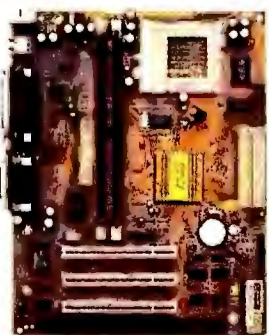
### Tiger 571 Motherboard Features At-A-Glance

Form Factor: Baby AT On Board Video: 4MB ISA Slots: 3  
Processor: Socket 7 On Board Audio: YES Memory: DIMM or SIMM  
Bus Speed: Up to 83MHz PCI Slots: 4 Max Memory: 384 MB

### Tiger 596 Micro-ATX Socket 7

**Motherboard & Case:** Motherboard mounted in dual-cooling fan mini case; 140 Watt power supply, cables, manual

**Pre-Assembled Kits:** Motherboard in dual-cooling fan mini case; 140Watt power supply, keyboard, speakers, mouse, microphone, 64-bit video, 56KFlex faxmodem, 1.44MB floppy drive, 24X CD-ROM, Wave Table sound.



### Tiger 596 Motherboard Features At-A-Glance

Form Factor: Micro ATX On Board Video: 4MB PCI ISA Slots: 1  
Processor: Socket 7 On Board Audio: YES Memory: DIMM  
Bus Speed: Up to 83MHz PCI Slots: 3 Max Memory: 256 MB

### Tiger 590 AT AGP Super Socket 7

**Motherboard & Case:** Motherboard mounted in dual-cooling fan case; 200 Watt power supply, cables & manual

**Pre-Assembled Kits:** Motherboard in dual-cooling fan case; 200 Watt power supply, keyboard, speakers, mouse, microphone, 3D AGP video, 56KFlex fax/modem, 1.44MB floppy drive, 24X CD-ROM, Wave Table sound.



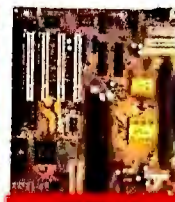
### Tiger 590 Motherboard Features At-A-Glance

Form Factor: AT On Board Video: 8MB AGP ISA Slots: 2  
Processor: Super Socket 7 On Board Audio: YES Memory: DIMM or SIMM  
Bus Speed: Up to 100MHz PCI Slots: 3 Max Memory: 256MB

### Tiger 767 AT, 760 ATX Slot 1

**Motherboard & Case:** Motherboard mounted in dual-cooling fan case; cables & manual

**Pre-Assembled Kits:** Motherboard in dual-cooling fan case; keyboard, speakers, mouse, microphone, 3D AGP video, 56KFlex faxmodem, 1.44MB floppy drive, 24X CD-ROM, Wave Table sound.



**Tiger 767** Form Factor: AT • CPU: Slot 1 • Bus Speed: Up to 100 MHz • On Board Video: 8MB AGP • On Board Audio: YES • PCI Slots: 4 • ISA Slots: 1 • Memory: DIMM • Max Memory: 768 MB

**Tiger 760** Form Factor: Micro ATX • CPU: Slot 1 • Bus Speed: Up to 100MHz • On Board Video: 8MB AGP • On Board Audio: YES • PCI Slots: 3 • ISA Slots: 1 • Memory: DIMM • Max Memory: 768 MB

Motherboard Design	Processors Supported	MOTHERBOARD ONLY		MOTHERBOARD & CASE		PRE-ASSEMBLED KITS	
		Item No.	1-2 units	3+ units	Item No.	1-2 units	3+ units
<b>Tiger 571 AT</b> including Wave Table sound and video	AMD Up to K6-300 & K62-266 Intel Pentium up to 233 MMX IBM/Cyrix Up to PR300	MB1-C-1B	\$77.99	\$69.99	BB1-C-1B	\$124.99	\$114.99
<b>Tiger 590 AT Super Socket 7</b> with AGP Technology and SoundPro Sound	All AMD Up to K62-400; Intel Pentium up to 233 MMX; IBM/Cyrix up to MII 350	MB1-E-4A	\$87.99	\$79.99	BB1-E-4A	\$139.99	\$128.99
<b>Tiger 596 Micro-ATX Socket 7</b> with Sound & Video; 512KB Pipelined Burst cache	All AMD Up to K62-266; Intel Pentium up to 233 MMX IBM/Cyrix up to MII 350	MB1-E-3A	\$77.99	\$69.99	BB1-E-3A	\$109.99	\$99.99
<b>Tiger 767 AT Slot 1</b>	Celeron up to 333MHz Intel Pentium II up to 450MHz	MB1-E-5A	\$99.99	\$91.99	BB1-E-5A	\$154.99	\$142.99
<b>Tiger 760 Micro ATX Slot 1</b>	Celeron up to 333MHz Intel Pentium II up to 450MHz	MB1-E-6A	\$99.99	\$91.99	BB1-E-6A	\$139.99	\$128.99
					KT1-C-1B	\$219.99	\$202.99
					KT1-E-4A	\$229.99	\$211.99
					KT1-E-3A	\$199.99	\$183.99
					KT1-E-5A	\$249.99	\$229.99
					KT1-E-6A	\$239.99	\$220.99

## Power Your Motherboard With A Premium Processor!

### AMD-K6-2 With 3DNow!

Tiger recommends the Super Socket 7 motherboard with these CPUs

### AMD K6-2 Processors

	1-2 Units	3 units or more
#CP2-K62-300 300 3DNow!	\$89.99	\$83.99
#CP2-K62-3-50 300 3DNow! 50-pk	\$3,949.99 (\$79 ea.)	
#CP2-K62-333 333 3DNow!	\$103.99	\$98.99
#CP2-K62-350 350 3DNow!	\$118.99	\$113.99
#CP2-K62-380 380 3DNow!	\$153.99	\$146.99
#CP2-K62-400 400 3DNow!	\$189.99	\$180.99



### IBM/Cyrix MII

Tiger recommends the our AT motherboard or the Tiger Super Socket 7 motherboard with these processors.

### IBM/Cyrix Processors

	1-2 Units	3 units or more
#CP2-6X300 MII 300 CPU	\$63.99	\$59.99
#CP2-6X3-50 MII 300 50-pk	\$2,799.99 (\$56 ea.)	
#CP2-6X333 MII 333 CPU††	\$98.99	\$94.99

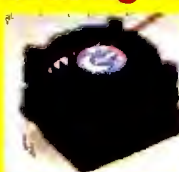


### 1.44MB 3.5" Drives



Item #	Description	1-2 Units	3 Units
S190-1000	3.5" 1.44MB Floppy Drive	\$19.99	\$17.49

### Cooling Fan SALE!



Item #	Description	1-2 Units	3 Units
C183-1000	Socket 7 Cooling Fan	\$4.99	\$4.49

Supports Socket 7 AMD, Intel, Cyrix/IBM CPUs

### Intel Celeron & Pentium II MMX

### Intel Celeron & Pentium II Processors

	1-2 Units	3 units or more
#CP1-CI300A Intel Celeron 300A (128K cache) processor w/fan	\$114.99	\$109.99
#CP1-CI333 Intel Celeron 333 (128K cache) processor w/fan	\$129.99	\$123.99
#CP1-P2-350 Intel Pentium II 350 processor w/fan*	\$269.99	\$261.99
#CP1-P2-400 Intel Pentium II 400 processor w/fan*	\$434.99	\$413.99
#CP1-P2-450 Intel Pentium II 450 processor w/fan*	\$644.99	\$612.99

Sorry, but as prices are always changing on CPUs and memory, we do not offer price protection in the event prices rise or fall. \*Requires 100MHz bus motherboard and 8ns PC100 SDRAM Memory. \*\* Requires 95MHz bus motherboard and 8ns PC100 SDRAM. †† Requires 83MHz bus motherboard. Call us for details and warranty information. No returns accepted on CPUs.

Why Wait? We'll Ship TODAY!

### CALL TODAY FOR YOUR FREE TIGER CATALOG!

CALL OUR KNOWLEDGEABLE SALES STAFF. WE'RE STANDING BY TO HELP YOU 24 HOURS!

TOLL FREE **888-222-9300**

INTERNATIONAL SALES: (305) 228-5200  
CANADA: 800-888-6167



## Tiger Special Offers For This Month...

### 56K PCI Modem Blowout!



**\$33.33**

Order# A109-1032 ■AMQUEST

Rockwell-Based 56.6K Flex, Fully Compatible PCI Modem With 230K Hyper Modem Feature!

- Full Duplex Speakerphone
- Up to 230,000 bps!
- Voice, Data, Fax, SVD and Caller ID! This is a full hardware modem! Wow!



## MEMORY SALE!

16MB 72-Pin EDO	\$29.99
32MB 72-Pin EDO	\$59.99
32MB 168-Pin SDRAM	\$49.99
64MB 168-Pin SDRAM	\$109.99

Prices subject to change. Call for current prices.

### Quantum Hard Drive SALE!

**10.2GB \$224.99**

THD-10C Quantum 10.2GB UDMA . \$224.99  
THD-4A Seagate 4.3GB UDMA . \$124.99

### Omega Zip Insider!



**\$74.99 # D55-9902 NM**

Also Available:  
Zip Disks: 8" 100MB #D55-1221

### NEC 15" Monitor



**\$139.99**

13.8 viewable area.  
1280 x 1024 resolution!  
.28mm dot-pitch.  
# D55-C500  
While supplies last.

### Build Your System With A Rugged Tiger Case!

Looking for the perfect case for your Tiger motherboard, well, here they are. The Tiger AT, ATX, and ATX Server Cases all include a mid-tower design, removable side panel.

CA-C-1A	AT Case 9-Bay 200W Pwr. Sup.	\$49.99
CA-C-2A	ATX Case 6-Bay 235W Pwr. Sup.	\$59.99
TCA-M-5A	ATX Server 6-Bay 300W Pwr. Sup.	\$99.99



# Avoid the Desktop-to-Doorstop Blues

IF YOU SUCCUMB to PC manufacturers' hype, it's easy to believe that computers are less like toasters and more like toast: not durable goods, but perishable commodities. Can this possibly be true?

Seems that way. I bought a new car in 1987. Since then I've replaced two desktop machines, three notebooks, two modems, a printer, and a monitor, not to mention a parallel cable and minor

items I've undoubtedly forgotten. The only pieces of pre-1987 computer equipment I'm still using are a serial cable and a phone cord.

The car still runs fine, and most of the PC equipment from that era probably would too, if I had it today. But the feeble memory, tiny hard disks, and inability to run modern software would make them about as useful as an eight-cylinder car with one spark plug.

Today's cheap computers add a new wrinkle to the calculation. With system prices so low, I'm tempted to simply buy a \$500 PC today and replace it with another one next year. But I probably won't, mostly because Microsoft has made upgrading to a new machine so ugly that I'll do just about anything to avoid it. In the DOS days, you could buy a new system, move your old files to it with LapLink, and get back to work. Now you can spend a day or a lifetime reinstalling your software and moving your files. That's a great incentive to stand pat. So is the certain knowledge that the thoroughbred you buy tomorrow will seem like a candidate for the glue factory in a matter of weeks.

## MAKE OBSOLESCENCE OBSOLETE

THOUGH WINDS OF CHANGE constantly fan the computer industry, there are ways to insulate yourself from them—at least for a while. At the risk of sounding like a shill for overpriced PCs, here are my five rules for delaying the agony of upgrading:

**Think fast.** People rarely complain that they bought a machine that's just too darned powerful. That goes for just about every



The thoroughbred you buy tomorrow will seem like a candidate for the glue factory in a matter of weeks.

aspect of computing: I agonized over buying a 1200-bps modem instead of a 300-bps model—until I got it home and understood the difference. In retrospect, I've made the worst purchases when I've aimed low. Want a 14.4-kbps PC Card modem, cheap? I thought I did.

**Think big.** No matter how big the memory, the monitor, or the drive, it always seems inconceivable that you can possibly make use of it—until you actually try. People laughed when I bought my first 10MB drive; I rue the hours I've wasted clearing files from my current 2GB unit.

**Run it till it drops.** Once you buy a new system, ignore new models for at least two years. Upgrades sooner than that are rarely worth it. When I bought my P-90 four years ago, it was state of the art. Today it's a dog, but if I weren't in the business of writing about products that can't run on it, I'd squeeze another year out of it. Obsolescence is in the eye of the beholder.

**Know when to quit.** The best reason to buy a new machine is to accommodate must-have hardware or software that just won't work with the old one. But there are others. On the road, I could live with the speed of my old 486 laptop. But I couldn't live with the built-in 14.4-kbps modem, the two laptop batteries that held charges inconsistently, or the half-gig hard drive that I sometimes had to remove, slam on a desk, and reinsert. Instead of spending hundreds trying to fix these things, I put that money toward a new PC that's better in every respect.

**Avoid notebooks.** I know: You have to buy notebooks. I have to buy notebooks. But they're still a bad deal in the long run. Less reliable than desktops, portables are also more expensive and difficult to fix. Because they come with slower CPUs, less memory, and smaller hard drives than desktops, they have shorter useful lives

even when you don't drop them onto concrete. Besides, toting a beat-up old clunker makes a statement about you and your business. If the message you want to convey is frugality, fine. If not, plan to upgrade notebooks about twice as often as desktop units.

But at least you can get a unit with a durable magnesium case. It may not last any longer, but when you replace it, you'll have a doorstop that will be the envy of your friends and colleagues.

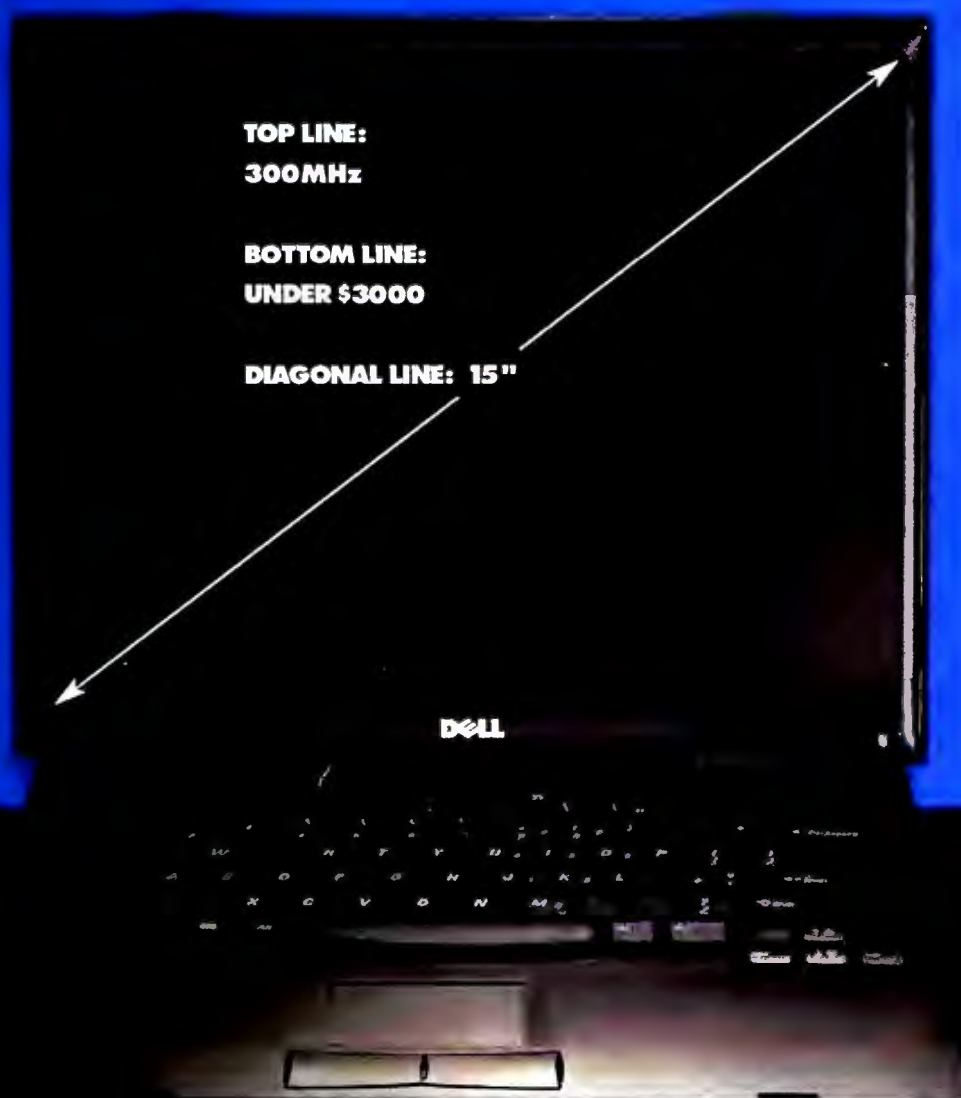
PC World Contributing Editor Stephen Manes has been writing about computers and their frustrations for more than 15 years. He is coauthor of *Gates*, a biography of Microsoft's chairman. ■



PC World® (ISSN 0737-8939) is published monthly at \$29.90 for one year (12 issues), \$59.80 for two years (24 issues), \$89.70 for three years (36 issues) by PC World Communications, Inc., 501 Second St. #600, San Francisco, CA 94107. Foreign orders must be prepaid in U.S. funds with additional postage. Add \$20 per year for Canada and Mexico; add \$46 per year for airmail for all other countries. Canadian GST Registration #R124669680. Periodicals postage paid at San Francisco, California, and additional mailing offices. Canada Post International Publications Mail Product, (Canadian Distribution) Sales Agreement No. 0463566. POSTMASTER: Send address changes to PC World, Subscription Dept., P.O. Box 55029, Boulder, CO 80328-5029. Editorial and business offices: 501 Second St. #600, San Francisco, CA 94107, 415/243-0500. Copyright © 1998, 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 20™, Top 20™, 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.



# FOR TOP-LINE, BOTTOM-LINE AND DIAGONAL-LINE PEOPLE.



Such a small price for such a big-screen notebook. We'll repeat the facts: our 15-inch display. Pentium® II processor at 300MHz. Only \$2899. Other relevant facts: 8MB of 2X AGP video for outstanding resolution and color, with optional DVD and other high-end peripherals available. Bottom line: great deal. Call, or click on our website for more information about the Dell® Inspiron™ 7000.


## DELL® INSPIRON™ 7000 D300LT PENTIUM® II PROCESSOR AT 300MHz

### All-in-One Multimedia Performance

- 15" XGA Active Matrix Display
- 64MB SDRAM (384MB Max\*)
- 4GB Ultra ATA Hard Drive
- Removable Combo 24X Max^^ Variable CD-ROM and Floppy Drive
- 2X AGP 8MB ATI RAGE Pro 3D Video
- 3D Surround Sound and Hardware Wavetable
- 12-Cell Intelligent Lithium Ion Battery
- Internal 56K Capable™ V.90 Fax Modem
- Trial Offer ConnectDirect™ Internet Access
- Microsoft® Office 97 Small Business Edition (Call about Our FREE MS® Office 2000 Upgrade Offer)
- Microsoft Windows® 98/Touchpad
- 3-Year Limited Warranty†

# \$2899

Business Lease\*: \$110/Mo., 36 Mos.

 **E-VALUE CODE: 03584-890128**



### USE THE POWER OF THE E-VALUE™ CODE.

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E-VALUE CODE ONLINE AT [WWW.DELL.COM/EVALUE](http://WWW.DELL.COM/EVALUE), OR GIVE IT TO YOUR SALES REP OVER THE PHONE.


**TO ORDER TOLL-FREE**

# 888-395-3449

**BUILD YOUR OWN AND ORDER ONLINE**

**BE DIRECT™**

# DELL®

 [www.dell.com](http://www.dell.com)







pentium® II



# POINT. CLICK. PURCHASE.

## DELL® DIMENSION® DESKTOPS FOR BUSINESS

**Common features:** Mini-Tower Model ♦ 3.5" Floppy Disk Drive ♦ Two USB Ports ♦ MS Office 97 Small Business Edition v2.0 plus Bookshelf 98 (Call about Our **FREE** MS Office 2000 Upgrade Offer) ♦ McAfee VirusScan ♦ MS Windows 98 ♦ Dell QuietKey Keyboard ♦ 3-Year Limited Warranty† ♦ 1-Year On-site<sup>A</sup> Service ♦ 24-Hour Toll-free Telephone and Online Technical Support ♦ **Upgrade:** 3-Year Next-Business-Day On-site<sup>A</sup> Service, add \$99

DELL DIMENSION XPS R450 PENTIUM® II PROCESSOR AT 450MHz	DELL DIMENSION XPS R450 PENTIUM II PROCESSOR AT 450MHz	DELL DIMENSION XPS R400 PENTIUM II PROCESSOR AT 400MHz	DELL DIMENSION V333c INTEL® CELERON™ PROCESSOR AT 333MHz
<ul style="list-style-type: none"> <li>256MB 100MHz SDRAM</li> <li>512KB Integrated L2 Cache</li> <li>NEW 17.2GB Ultra ATA Hard Drive</li> <li>15" (15.0" viewable) Flat Panel 1500FP Display</li> <li>16MB STB nVidia TNT 3D AGP Graphics Card</li> <li>4.8X DVD-ROM Drive and Decoder Card</li> <li>Turtle Beach Montego A3D Sound</li> <li>ACS-295 Speakers with Subwoofer</li> <li>3Com® USRobotics V.90™ PCI Telephony WinModem</li> <li>Imega Zip 100MB Internal Drive</li> <li>APC SurgeStation Pro8T2</li> </ul>	<ul style="list-style-type: none"> <li>128MB 100MHz SDRAM</li> <li>512KB Integrated L2 Cache</li> <li>14.4GB Ultra ATA Hard Drive (7200 rpm)</li> <li>NEW 21" (20.0" viewable, .26dp) M1110 Monitor</li> <li>16MB STB nVidia TNT 3D AGP Graphics Card</li> <li>40X Max™ Variable CD-ROM Drive</li> <li>3Com 3C905B 10/100 NIC</li> <li>★ Upgrade to a NEW 15" (15.0" viewable) Flat Panel 1500FP Display, add \$225.</li> <li>★ 3Com USRobotics V.90™ PCI Telephony WinModem, add \$49.</li> </ul>	<ul style="list-style-type: none"> <li>96MB 100MHz SDRAM</li> <li>512KB Integrated L2 Cache</li> <li>NEW 12.9GB Ultra ATA Hard Drive</li> <li>19" (17.9" viewable, .26dp) 1200HS Monitor</li> <li>16MB STB nVidia TNT 3D AGP Graphics Card</li> <li>40X Max™ Variable CD-ROM Drive</li> <li>Crystal 3D 64V Wavetable Sound</li> <li>harman/kardon HK-195 Speakers</li> <li>APC SurgeStation Pro8T2</li> <li>★ Upgrade to 128MB 100MHz SDRAM, add \$69.</li> <li>★ Imega Zip 100MB Internal Drive with Two Cartridges, add \$99.</li> </ul>	<b>Network-Designed Desktop</b> <ul style="list-style-type: none"> <li>64MB SDRAM</li> <li>128KB Integrated L2 Cache</li> <li>8.4GB Ultra ATA Hard Drive</li> <li>17" (15.9" viewable) 1000LS Monitor</li> <li>8MB ATI 3D AGP Graphics</li> <li>32X Max™ Variable CD-ROM Drive</li> <li>Turtle Beach Montego A3D Sound</li> <li>harman/kardon HK-195 Speakers</li> <li>Integrated Intel 10/100 Ethernet Controller</li> <li>★ Upgrade to 96MB SDRAM, add \$69.</li> <li>★ Upgrade to a NEW 12.9GB Ultra ATA Hard Drive, add \$79.</li> </ul>
<b>\$3379</b>	<b>\$2479</b>	<b>\$1999</b>	<b>\$1379</b>
Business Lease <sup>o</sup> : \$128/Mo., 36 Mos.	Business Lease <sup>o</sup> : \$94/Mo., 36 Mos.	Business Lease <sup>o</sup> : \$76/Mo., 36 Mos.	Business Lease <sup>o</sup> : \$52/Mo., 36 Mos.
 <b>E-VALUE CODE: 03585-590133</b>	 <b>E-VALUE CODE: 03585-590124a</b>	 <b>E-VALUE CODE: 03585-590119a</b>	 <b>E-VALUE CODE: 03585-590113</b>

## DELL DIMENSION DESKTOPS FOR HOME

**Common features:** Mini-Tower Model ♦ 512KB Integrated L2 Cache (128KB on Intel Celeron Processor-based Systems) ♦ NEW 3Com USR V.90™ PCI Telephony WinModem with Trial Offer ConnectDirect™ Internet Access ♦ 3.5" Floppy Disk Drive ♦ Two USB Ports ♦ NEW MS Works Suite 99 with Money 99 Basic ♦ McAfee VirusScan ♦ MS Windows 98 ♦ 3-Year Limited Warranty† ♦ 1-Year At-home<sup>A</sup> Service **Upgrades:** 3-Year At-home<sup>A</sup> Service, add \$99 ♦ HP DeskJet 722c, add \$299 ♦ HP OfficeJet 710, add \$499

DELL DIMENSION XPS R450 PENTIUM II PROCESSOR AT 450MHz	DELL DIMENSION XPS R450 PENTIUM II PROCESSOR AT 450MHz	DELL DIMENSION XPS R450 PENTIUM II PROCESSOR AT 450MHz	DELL DIMENSION V333c INTEL CELERON PROCESSOR AT 333MHz
<ul style="list-style-type: none"> <li>128MB 100MHz SDRAM</li> <li>NEW 17.2GB Ultra ATA Hard Drive</li> <li>NEW 19" (18.0" viewable, .26dp) Trinitron P990 Monitor</li> <li>16MB STB nVidia TNT 3D AGP Graphics Card with STB PCI TV/FM Tuner</li> <li>4.8X DVD-ROM Drive and Decoder Card</li> <li>Turtle Beach Montego II A3D 320V Sound Card</li> <li>ACS-495 Dolby Surround Sound Speakers with Subwoofer</li> <li>Dell Comfort Key Keyboard</li> <li>Logitech MouseMan Wheel+ (PS/2V)</li> </ul>	<ul style="list-style-type: none"> <li>128MB 100MHz SDRAM</li> <li>NEW 12.9GB Ultra ATA Hard Drive</li> <li>19" (17.9" viewable, .26dp) 1200HS Monitor</li> <li>8MB ATI XPERT 98D 3D AGP Graphics Card</li> <li>4.8X DVD-ROM Drive</li> <li>Turtle Beach Montego A3D 64V Sound Card</li> <li>ACS-295 Speakers with Subwoofer</li> <li>Imega Zip 100MB Internal Drive</li> <li>Dell Comfort Key Keyboard</li> <li>MS IntelliMouse™</li> </ul>	<ul style="list-style-type: none"> <li>128MB 100MHz SDRAM</li> <li>NEW 12.9GB Ultra ATA Hard Drive</li> <li>17" (15.9" viewable) 1000LS Monitor</li> <li>8MB ATI XPERT 98D 3D AGP Graphics Card</li> <li>4.8X DVD-ROM Drive</li> <li>Turtle Beach Montego A3D 64V Sound Card</li> <li>ACS-295 Speakers with Subwoofer</li> <li>Dell QuietKey Keyboard</li> <li>MS IntelliMouse</li> <li>★ Upgrade to a 17" (16.0" viewable, .26dp) Trinitron 1000HS Monitor, add \$109.</li> </ul>	<ul style="list-style-type: none"> <li>64MB SDRAM</li> <li>8.4GB Ultra ATA Hard Drive</li> <li>17" (15.9" viewable) 1000LS Monitor</li> <li>ATI 8MB 3D AGP Graphics</li> <li>32X Max™ Variable CD-ROM Drive</li> <li>Yamaha XG 64V Wavetable Sound</li> <li>harman/kardon HK-195 Speakers</li> <li>Dell QuietKey Keyboard</li> <li>Logitech First Mouse+ Wheel (PS/2v)</li> <li>★ Imega Zip 100MB Internal Drive with Two Cartridges, add \$99.</li> <li>★ Upgrade to 128MB 100MHz SDRAM, add \$139.</li> </ul>
<b>\$2799</b>	<b>\$2299</b>	<b>\$1999</b>	<b>\$1299</b>
Personal Lease <sup>o</sup> : \$105/Mo., 36 Mos. <sup>o</sup>	Personal Lease <sup>o</sup> : \$86/Mo., 36 Mos.	Personal Lease <sup>o</sup> : \$75/Mo., 36 Mos.	Personal Lease <sup>o</sup> : \$50/Mo., 36 Mos.
 <b>E-VALUE CODE: 03585-500127a</b>	 <b>E-VALUE CODE: 03585-500122a</b>	 <b>E-VALUE CODE: 03585-500119</b>	 <b>E-VALUE CODE: 03585-500112</b>

Phone Hours: M-F 7a-9p • Sa 10a-6p • Su 12p-5p CT • In Canada,\* call 800-232-6978 • In Mexico,\* call 001-800-210-7607 • GSA Contract #GS-35F-4076D



Pricing not discountable. \*Prices and specifications valid in U.S. only and subject to change without notice. †For a complete copy of Guarantees or Limited Warranties, write Dell USA L.P., Attn: Warranties, One Dell Way, Round Rock, TX 78682. ‡On-site service provided via service contract between customer and third party provider, and is not available in certain remote areas. Technician dispatched if necessary pursuant to phone based troubleshooting with technical support personnel. §Business leasing arranged by Dell Financial Services, L.P., an independent entity, to qualified customers. Above lease payments based on 36-month lease, and do not include taxes, fees, shipping charges, subject to credit approval and availability. Above lease terms subject to change without notice. 40X Max/17X Min, 32X Max/14X Min, 24X Max/10X Min. †Download speeds limited to 53Kbps. Upload speeds are less (in the 30Kbps range) and vary by modem manufacturer. Speeds also vary depending on line conditions. Analog phone line and compatible server equipment required. \*Max 100MB RAM configurations require a factory installed 128MB SDRAM, which must be installed at time of initial purchase. Intel, the Intel logo and Pentium are registered trademarks and Celeron is a trademark of Intel Corporation. MS, Microsoft, IntelliMouse, Windows and Windows NT are registered trademarks of Microsoft Corporation. 3Com is a registered trademark and Fast Ethernet is a trademark of 3Com Corporation. Trinitron is a registered trademark of Sony Corporation. HP and DeskJet are registered trademarks and OpenView is a trademark of Hewlett-Packard Corporation. © 1999 Dell Computer Corporation. All rights reserved.

Personal leasing arranged by Dell Financial Services L.P., an independent entity, to qualified customer amount of monthly lease payments above based on 36-month lease. All above monthly lease payments exclude taxes which may vary (for example, Hartford City, IN sales tax: \$6.34/month); shipping cost due with first payment; no security deposit required subject to credit approval and availability. Lease terms subject to change without notice.



## SOFTWARE OPTIONS for Dell Dimension Systems

### Microsoft Office 97 Small Business Edition v2.0 includes:

- Word 97
- Excel 97
- Publisher 98
- Outlook 98
- Small Business Financial Manager 98
- Direct Mail Manager
- Expedia Streets 98

### Microsoft Works Suite 99 includes:

- Word 97
- Encarta Encyclopedia 99
- Money Basic 99
- Works 4.5a
- Works Calendar
- Graphics Studio Greetings
- Expedia Streets 98

### Software Upgrades:

- Intuit QuickBooks v6.0, add \$118.
- MS Windows NT\* Workstation 4.0, add \$99.

## DELL WORKSTATION

### DELL PRECISION™ WORKSTATION 410 PENTIUM II PROCESSOR AT 450MHz (DUAL PROCESSOR/RAID CAPABLE)

- 128MB 100MHz ECC SDRAM
- 9GB Ultra-2/LVD SCSI Hard Drive
- NEW 19" (18.0" viewable, .26dp) Trinitron® P990 Monitor
- Diamond 8MB AGP Graphics Card
- 40X Max™ Variable CD-ROM Drive
- Sound Blaster Pro Compatible Sound
- 3Com 10/100 PCI TX NIC with Remote Wakeup
- Remote Client Manageability Support via DMI 2.0; Wakeup on LAN Capable
- MS Windows NT Workstation 4.0 and 1-Year NT Telephone Support
- 3-Year NBD On-site<sup>3</sup> Service
- 7x24 Dedicated Workstation Hardware Telephone and Online Technical Support

## \$3799

Business Lease<sup>o</sup>: \$144/Mo., 36 Mos.

 **E-VALUE CODE: 03585-490137**

## DELL POWEREDGE® SERVERS

**Common features:** 512KB Integrated L2 ECC Cache ♦ Integrated Ultra-2/LVD and Ultra/Narrow SCSI Controllers ♦ 32X Max<sup>^</sup> Variable SCSI CD-ROM Drive ♦ HP™ OpenView™ NNM Special Edition ♦ 3 External 5.25" Drive Bays plus Floppy ♦ 7x24 Dedicated Server Hardware Technical Telephone Support

### DELL POWEREDGE 2300 SERVER PENTIUM II PROCESSOR AT 450MHz (RAID 5 CONFIGURATION)

- 128MB 100MHz ECC SDRAM
- Three 9GB Ultra-2/LVD SCSI Hot-Swap Hard Drives
- Ultra-2/LVD PowerEdge Expandable RAID Controller 2/SC
- Intel Pro/100+ PCI Ethernet Adapter
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 6-1" Hard Drive Bays
- 3-Year Next-Business-Day On-site<sup>3</sup> Service
- ★ APC Smart-UPS 700W Power Supply, add \$369.

## \$5499

Business Lease<sup>o</sup>: \$202/Mo., 36 Mos.

 **E-VALUE CODE: 03585-290154**

### DELL POWEREDGE 2300 SERVER PENTIUM II PROCESSOR AT 350MHz (DUAL PROCESSOR/RAID CAPABLE)

- 64MB 100MHz ECC SDRAM
- 4GB Ultra-2/LVD SCSI Hard Drive (Hot-Swap Optional)
- Intel Pro/100+ PCI Ethernet Adapter
- 6 Expansion Slots: 4 PCI, 2 PCI/ISA
- 4-1.6" or 6-1" Hard Drive Bays
- 3-Year Next-Business-Day On-site<sup>3</sup> Service
- ★ Microsoft Windows NT Server 4.0 (10 Client Access Licenses), add \$799.
- ★ 12/24GB Variable SCSI DAT Tape Backup Unit, add \$749.

## \$2449

Business Lease<sup>o</sup>: \$93/Mo., 36 Mos.

 **E-VALUE CODE: 03585-290124**

## DELL INSPIRON™ NOTEBOOKS

**Common features for the Inspiron 7000:** 3D Surround Sound and Hardware Wavetable ♦ 12-Cell Intelligent Lithium Ion Battery ♦ Microsoft Office 97 Small Business Edition (Call about Our FREE MS Office 2000 Upgrade Offer) ♦ MS Windows 98 ♦ S-Video Port ♦ Touchpad ♦ 3-Year Limited Warranty<sup>1</sup> **Common features for the Inspiron 3500:** 3D Surround Sound and Software Wavetable ♦ Modular Floppy Drive ♦ Modular 24X Max<sup>^^</sup> Variable CD-ROM ♦ 9-Cell Intelligent Lithium Ion Battery ♦ MS Office 97 Small Business Edition (Call about Our FREE MS Office 2000 Upgrade Offer) ♦ MS Windows 98 ♦ Touchpad ♦ 3-Year Limited Warranty<sup>1</sup>


### DELL INSPIRON 7000 D300LT PENTIUM II PROCESSOR AT 300MHz

#### All-in-One Multimedia Performance

- 15" XGA Active Matrix Display
- 96MB SDRAM (384MB Max<sup>^</sup>)
- 4GB Ultra ATA Hard Drive
- Removable Combo 2X DVD-ROM and Floppy Drive
- 2X AGP 8MB ATI RAGE Pro 3D Video
- Internal 56K Capable™ V.90 Fax Modem
- Trial Offer ConnectDirect Internet Access
- ★ Upgrade to 128MB SDRAM, add \$99.

## \$3199

Business Lease<sup>o</sup>: \$121/Mo., 36 Mos.

 **E-VALUE CODE: 03585-890131**


### DELL INSPIRON 7000 D300GT PENTIUM II PROCESSOR AT 300MHz

#### All-in-One Multimedia Performance

- 14.1" XGA Active Matrix Display
- 64MB SDRAM (384MB Max<sup>^</sup>)
- 4GB Ultra ATA Hard Drive
- Removable Combo 24X Max<sup>^^</sup> Variable CD-ROM and Floppy Drive
- 2X AGP 4MB ATI RAGE Pro 3D Video
- Deluxe Nylon Case
- ★ Upgrade to 96MB SDRAM, add \$99.
- ★ Upgrade to a 6.4GB Ultra ATA Hard Drive, add \$149.
- ★ Second Intelligent Lithium Ion Battery, add \$129.

## \$2799

Business Lease<sup>o</sup>: \$106/Mo., 36 Mos.

 **E-VALUE CODE: 03585-890127**


### DELL INSPIRON 3500 D266GT PENTIUM II PROCESSOR AT 266MHz

#### Light Weight, Light Price

- 14.1" XGA Active Matrix Display
- 32MB SDRAM (256MB Max)
- 4.3GB Ultra ATA Hard Drive
- NeoMagic MediaMagic 256AV AGP Video
- APC SurgeArrest Notebook Pro
- ★ Upgrade to 64MB SDRAM, add \$99.
- ★ Internal 56K Capable™ V.90 Fax Modem, add \$59.
- ★ Inspiron 3500 Port Replicator, add \$149.

## \$2379

Business Lease<sup>o</sup>: \$90/Mo., 36 Mos.

 **E-VALUE CODE: 03585-890123a**

### DELL INSPIRON 3500 D233XT PENTIUM II PROCESSOR AT 233MHz

#### Light Weight, Light Price

- 13.3" XGA Active Matrix Display
- 32MB SDRAM (256MB Max)
- 3.2GB Ultra ATA Hard Drive
- NeoMagic MediaMagic 256AV AGP Video
- ★ Internal 56K Capable™ V.90 Fax Modem, add \$59.
- ★ Second Intelligent Lithium Ion Battery, add \$129.
- ★ Upgrade to 64MB SDRAM, add \$99.
- ★ Upgrade to a 4.3GB Ultra ATA Hard Drive, add \$99.

## \$1999

Business Lease<sup>o</sup>: \$76/Mo., 36 Mos.

 **E-VALUE CODE: 03585-890119**



### USE THE POWER OF THE E-VALUE™ CODE.

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E-VALUE CODE ONLINE AT [www.dell.com](http://www.dell.com) OR CALL 888-395-3449. REP OVER THE PHONE. CHECK THE AT THE PRICES. AND GET 24 HR. ONLINE TECH SUPPORT.

### TO ORDER TOLL-FREE

## 888-395-3449

BUILD YOUR OWN AND ORDER ONLINE

BE DIRECT™

# DELL



[www.dell.com](http://www.dell.com)



# AFTER OUR THIRD MVP WIN, WE THOUGHT YOU'D LIKE TO TAKE HOME THE TROPHY.



**"THE FASTEST PC ON THE PLANET"**  
— PC Computing 1/99<sup>†</sup>


We did it again. For the third year in a row, a Dell<sup>®</sup> Dimension<sup>™</sup> has received a PC Computing<sup>††</sup> MVP award. Of course, they praised strengths like the high-speed processor and screaming fast hard drive. But its real power lies in what it can give you: assurance. After all, Dimension systems are the leading PC Computing MVP winners in the desktop category since 1990. Call, or visit [dell.com](http://dell.com) and get an MVP on your team.

## DELL<sup>®</sup> DIMENSION<sup>®</sup> XPS R450 PENTIUM<sup>®</sup> II PROCESSOR AT 450MHz

- 128MB 100MHz SDRAM
- 512KB Integrated L2 Cache
- NEW 12.9GB Ultra ATA Hard Drive
- 17" (16.0" viewable, .26dp) Trinitron<sup>®</sup> 1000HS Monitor
- 16MB STB nVidia TNT 3D AGP Graphics Card
- 40X Max<sup>™</sup> Variable CD-ROM Drive
- Turtle Beach Montego II A3D 320V Sound Card
- ACS-295 Speakers with Subwoofer
- Microsoft<sup>®</sup> Office 97 Small Business Edition v2.0 plus Bookshelf 98 (Call about Our *FREE* MS<sup>™</sup> Office 2000 Upgrade Offer); McAfee VirusScan
- Microsoft Windows<sup>®</sup> 98
- Dell QuietKey<sup>™</sup> Keyboard
- Logitech MouseMan Wheel (PS/2v)
- 3-Year Limited Warranty<sup>†</sup>
- 1-Year On-site<sup>Δ</sup> Service

# \$2199

Business Lease<sup>®</sup>: \$83/Mo., 36 Mos.

 **E-VALUE CODE: 03583-590121**

## UPGRADE TO THE MVP "STATE-OF-THE-ART"<sup>††</sup> AWARD-WINNING SYSTEM

- ★ 14.4GB Ultra ATA Hard Drive (7200 rpm)
- ★ 4.8X DVD-ROM Drive and Decoder Card
- ★ 3Com<sup>™</sup> 3C905B 10/100 NIC
- ★ 3Com USRobotics V.90<sup>™</sup> PCI Telephony WinModem
- ★ Iomega Zip 100MB Internal Drive

# ADD \$399

Add to Business Lease<sup>®</sup>: \$16/Mo., 36 Mos.

 **E-VALUE CODE: 03583-590125**

Phone Hours: M-F 7a-9p • Sa 10a-6p • Su 12p-5p CT • In Canada,\* call 800-232-6978  
In Mexico,\* call 001-800-210-7607 • GSA Contract #GS-35F-4076D



**USE THE POWER OF THE  
E-VALUE<sup>™</sup> CODE.**

MATCH OUR LATEST TECHNOLOGY WITH OUR LATEST PRICES. ENTER THE E-VALUE CODE ONLINE AT [WWW.DELL.COM/EVALUE](http://WWW.DELL.COM/EVALUE). OR GIVE IT TO YOUR SALES REP OVER THE PHONE. ALSO GO ONLINE TO DESIGN YOUR IDEAL COMPUTER. CHECK THE LATEST PRICES AND GET 24-HR. ONLINE TECH SUPPORT.


**TO ORDER TOLL-FREE**

# 888-395-3449

**BUILD YOUR OWN AND ORDER ONLINE**

**BE DIRECT<sup>™</sup>**

# DELL<sup>®</sup>

 [www.dell.com](http://www.dell.com)