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APRIL 1998



Break the 56K Barrier

New Modems
Promise Higher-
Speed Web Access



Best Big Monitors!

We Rate 27
Leading Models—
Priced Right



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Best Connections
for Lowest Cost

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The Scoop on Online Discounts
How to Try Before You Buy

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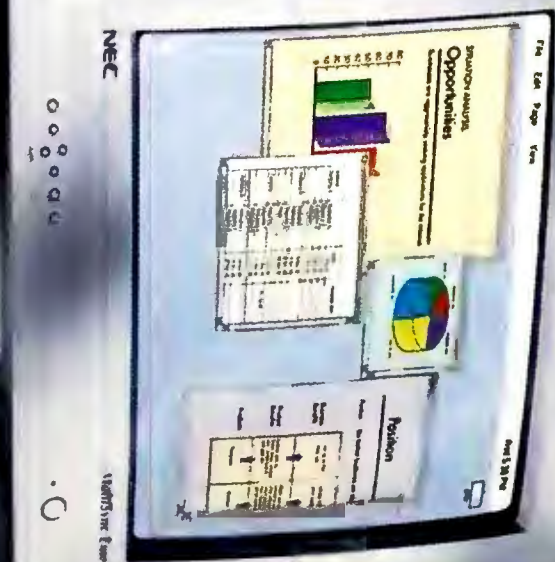
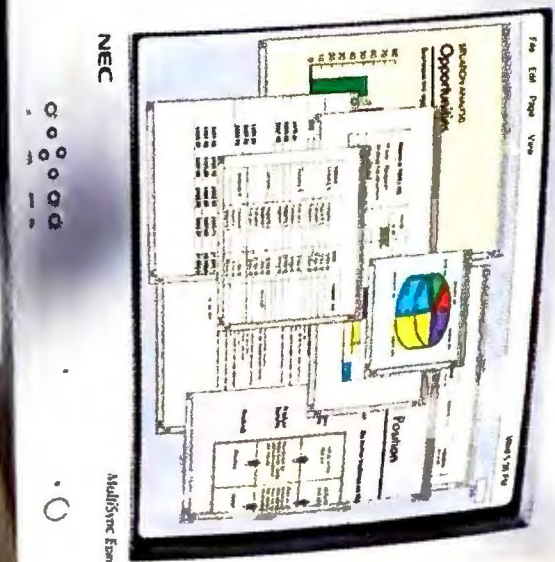
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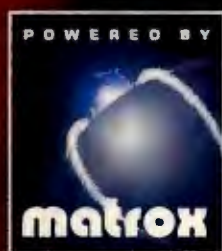
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COVER STORY

104 BEST FREE STUFF ONLINE

INTERNET As e-commerce takes hold and more Web sites begin charging for content that used to cost you nothing, good free stuff is getting harder and harder to find. For our third annual guide, we scoured the Internet, tossed aside the dreck, and found worthwhile downloads. Read on for the best of the Net—at the best possible price.

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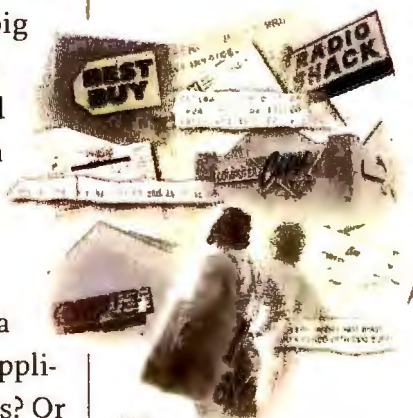
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 complex new Web authoring application to build even simple pages? Or will the Web tools that come with Communicator, Internet Explorer, and word processors suffice? We tried them all and give one package the nod.



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available on PC World
Online. www.pcworld.com


169 BIG SCREEN DEBUTS

REVIEW A large monitor is great for working with gonzo graphics, sprawling spreadsheets, and crammed Windows desktops, but spending \$2000 for it is hard to justify. We found great 19-inch displays for well under \$1000—and 21-inchers for as little as \$1449.

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187 DO YOU HAVE ALL THE INTERNET YOU NEED?

 Does your Web access setup really fit your small-office needs? From ISPs to bandwidth options, here's how to choose your business's best solution for a little Internet access—or a lot.

COVER Digital composition by Jeff Berlin

54 HOW LOW CAN PC PRICES GO? \$799 AND SINKING

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59 INTEL INSIDE GRAPHICS BOARDS MAKES AGP ZOOM

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60 MODEM DOUBLERS FALL FAR SHORT OF BOLD CLAIMS

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66 LAN WIRING WORRIES? USE PHONE, AC LINES TO UNTANGLE

Small offices could benefit from networks without wires—if high-speed exchange of large files isn't an issue.

68 FLAWED PRIVACY AGREEMENT LETS IT ALL HANG OUT

A new agreement to protect consumer privacy won't stop the peddling of credit histories, social security numbers, and other sensitive information.

72 REACH OUT AND BROWSE SOMETHING

They look intriguing, but pricey LCD phones have limited Web functionality.

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203 PENTIUM II-333s RAISE THE BAR

TOP 100 Systems from Dell and NEC—the first based on Intel's 333-MHz Pentium II chip—debut as the fastest PCs yet, just as we expected. But the even faster PCs to come may keep you from jumping the gun on these powerhouses.

206 POWER DESKTOPS

TOP 20 This month's chart features some tempting 300-MHz-plus PCs, including NEC's new Direction SPL 333 and three PII-300s from Acma, CLR, and Racer.

216 BUDGET DESKTOPS

TOP 20 Pentium IIs surge onto the chart, with entries from Unicent and Midwest Micro. But PCs with alternative chips challenge, including a \$1349 Micro Express midtower based on AMD's K6-233.

226 NOTEBOOKS

TOP 10 The first PMMX-266 portable, Dell's Inspiron 3000 M266XT, was only a hair faster than the speediest PMMX-233 notebook we've tested. But its \$3299 price keeps the Inspiron on the chart.

232 HOME PCS

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239 19- AND 21-INCH MONITORS

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TOP 10 Packed with features like voice mail and speakerphone, 3Com's new 56-kbps fax-modem is almost a Best Buy.

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@HOME

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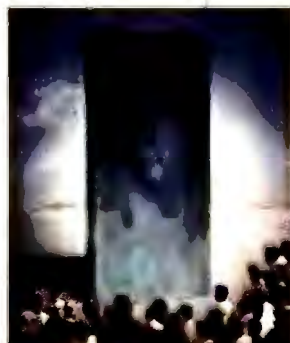
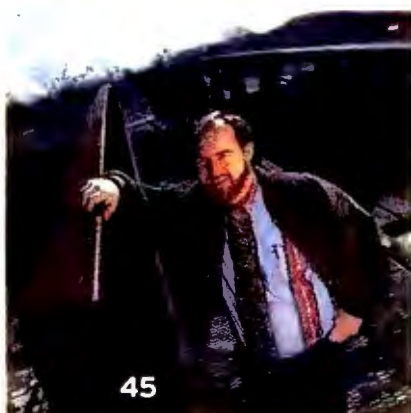
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15" Micron 500FGx, .28dp SVGA NI color
monitor (13.7" display)

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1.44MB 3.5" floppy drive
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speakers
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warranty
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STANDARD FEATURES

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Phoenix Plug and Play Ready Flash 2MB BIOS
Integrated 100MB Iomega Zip drive
32 voice wavetable stereo sound, Advent 270
speakers
3Com/US Robotics 56Kbps x2 data/fax modem**
Diamond Viper V330 AGP 128-bit 3D video 4MB
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2-way infrared port, S-Video, USB ports
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3.5" floppy drive
24X variable speed ATAPI CD-ROM drive
Network Adapter with Wake-On-LAN technology
S3 ViRGE graphics accelerator, 2MB EDO RAM
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Advanced Hardware Monitoring and Power Management features
Chassis intrusion alert
Microsoft IntelliMouse
Microsoft Windows NT[®] Workstation 4.0
5-year/3-year Micron Power limited warranty

\$1,549

Bus. Lease \$54/mo.

ClientPro 766Xi

Intel 266MHz Pentium II processor with MMX technology
64MB SDRAM
3.2GB SMART Ultra ATA hard drive
17" Micron 700FGx, .26dp monitor (16" display)

512KB internal L2 secondary cache, DMI compliant, 2MB flash BIOS
3.5" floppy drive
24X variable speed ATAPI CD-ROM drive
Network Adapter with Wake-On-LAN Technology
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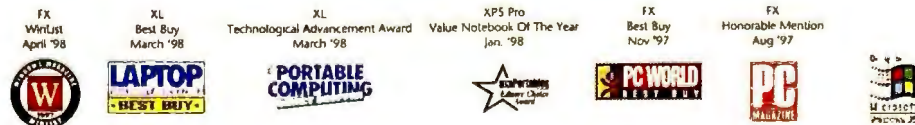
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Can't Anybody Here Fix PCs?

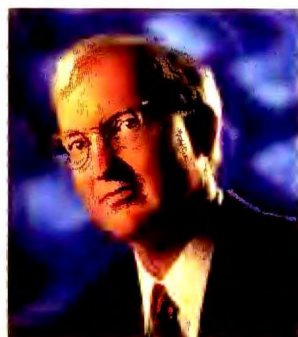
FOR DECADES NOW, MANY OF US have been unable to tell whether the mechanic in an automobile repair shop is telling us the truth about what our cars need. No doubt in the days of the horse-drawn carriage, many owners couldn't be sure if they were getting straight information from the livery stable folks about what their horses needed. Now we face the same problem with our PCs.

When the screen behaves strangely, is the graphics card at fault? Could the problem be a loose cable between the monitor and the card? Could it be the software driver? Is the card properly seated in the PCI slot? Is the system board talking correctly to the PCI slots? Is the BIOS configured the right way to handle graphics memory? Is Windows 95 getting along well with the BIOS, the driver, and the application that shows the screen disturbance? Many of us have learned through trial and error to reinstall drivers and to check cables and the seating of cards before trying anything else. But the people who can go further, wielding logic probes, oscilloscopes, and specialized diagnostic programs, are likelier to be computer designers than ordinary computer users.

THE DEATH OF A ROBOT

INTRACTABLE AND MYSTERIOUS malfunctions are the downside of the PC's "open" standard. This standard permits hundreds of different add-on cards and thousands of different applications to work together—much of the time. But when things go wrong and we can't get our work done, panic sets in. Is the culprit a hardware failure or something more ephemeral? Your workplace may employ specialists to diagnose and fix PCs. But many businesses must turn to outsiders for help, and almost everyone must do so when faced with a balky home PC.

How do we know when to seek professional help? Consider my plight when half a dozen five-year-old boys were left alone for hours with one of my PCs. No one ever managed to reconstruct precisely what happened in that room. My own theory is that some sort of battle raged between five gallant space warriors and an evil robot with a 90-MHz Pentium instead of a heart. The Pentium robot lost hands down; it wouldn't boot properly afterward.



We decided
to **try to find a**
national computer
repair chain we
could **recommend**
to readers.

An attempt to boot from a start-up disk failed because the floppy drive had been stuffed with plastic coins. After I removed them, the PC booted from the floppy drive, but the hard disk was inaccessible. Even when plugged into two other machines, the hard disk was unreadable. When the drive started making a loud, sickly click-click-click sound, I threw in the towel.

Off to buy a new hard disk. Imagine my surprise when the new drive and reinstalled software revealed another problem: The CD-ROM drive, connected to the secondary channel of the system board's IDE connector, didn't work. It worked fine when plugged into the primary channel, but that slowed down the hard drive. The secondary channel refused to talk to various other IDE devices as well. Not even reinstalling the Flash BIOS could restore the secondary IDE channel to health.

Off to buy a new system board. After dismantling the system, installing the new board, and disconnecting and reconnecting dozens of devices and cables, I had a working PC again. The cost: several hundred dollars, plus the skin on my knuckles and every spare moment of personal time for two weeks.

RELUCTANCE TO SEEK HELP

WHY HADN'T I SIMPLY hauled the machine to a computer repair service in the first place? For one thing, no warranty should be expected to cover damage done by a pack of unsupervised young boys. But beyond that, I expected outside repair to be expensive and time-consuming, and I felt uncomfortable not knowing whether the outside diagnosis was correct and the remedy fairly priced. How could I have known that the hard drive and system board really needed replacement if I hadn't put in the time myself?

Armed with our own numerous horror stories, we at *PC World* decided to try to find a national computer repair chain we could recommend to readers. We dispatched editors with carefully rigged, easily fixable PCs to 20 stores representing four giant national chains. What we found was a shock. Though I want to commend CompUSA for outperforming the other chains, even its record is nothing to crow about (unless you're lucky enough to live near its Santa Clara, California, superstore). For the shocking facts about nationwide computer repair, read "PC Repair Rip-Off!"

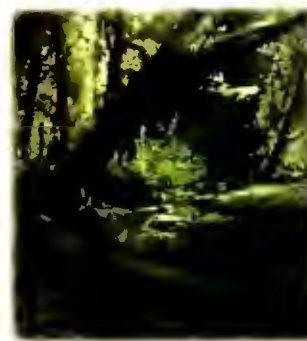
We hope that articles like this and vigilant customers like you bring about improvements so that we can return to this topic someday and unhesitatingly recommend at least one national chain. Maybe next year.

Phil Lemmons is editorial director of PC World.

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YOUR TAKE ON: Digital cameras not so cool? ♦ Big portables ♦ PC donations

THE MILLENNIUM BUG BITES

AS A SUBSCRIBER and banker, I wanted to let you know that the year 2000 problem is happening now ["Year 2000: Impending PC Disaster? Not If You Plan Ahead," *Top of the News*, January]. We are receiving calls from hundreds (soon to be thousands) of MasterCard/Visa card holders who say their card is being denied because it has an expiration date of 01/31/00 (or later) and is being rejected as expired.

Alan B. Brucks, Buffalo, New York

DIGICASH PREFERRED

AS A CONSUMER, I disagree that digital cash has no obvious benefits ["Digital Cash Gets Real: Good-Bye to Free Web Content?" *Top of the News*, January]. I don't like using my credit card on the Net; indeed, I only use it for emergencies. For me, digital dollars would represent a major convenience.

*Leslie Haltbakk
Merrimack, New Hampshire*

DIGITAL CAMERAS

YOU MISSED ONE POINT about the Sony Digital Mavica, your Best Buy digital camera ["Snap Judgments," February], although I like it too. At one camera shop in the Houston area, I was told that the Sony was not acceptable to them because of our climate, which is usually humid. One can see where moving the camera and floppy disks from a cool, dry, air-conditioned house to warm, moist outdoors can cause condensation to form on the camera and those delicate disk read/write parts, not to mention the lens.

Bill Maddrey, La Porte, Texas

YOUR REVIEW LEFT OUT the only model I found worth purchasing: the Olympus D-320L. This outstanding unit has the optical viewer absolutely necessary for correctly framing a scene, astounding high resolution, a camera body that feels like a camera and is easy to use, a powerful flash, storage capacity way beyond the others, and a nice LCD monitor for instant

checks. Too much money? Then jump to the D-220L, the next one down in the Olympus line.

I made my choice as someone with more than 25 years as a professional photographer. Most of the items you picked qualify as technical toys designed by some computer geek who put technology first and human design needs last.

Roger Stillwell, Washington, D.C.

PORTABLES VERSUS LAPTOPS

IN A SIDEBAR to your story on future PCs ["Mobile PCs: One Size Won't Fit All," January, page 140], Andrew Seybold warns that people don't want a bulky, briefcase-size portable computer with a 17-inch display. But Seybold, and the industry, are forgetting about a large, untapped market: power users. As a software engineer, I tend to dismiss laptops as toys. But show me a monster machine in a briefcase, and I'll plunk down my money. More than long battery life or light weight, I want the ability to shuttle my ►

HOT BUTTON

Do AOL and IBM Spell ISP Hell?

THANKS FOR the article on Internet service providers ["ISPs You Can Count On," January]. I started on America Online but have weaned myself from it. Besides getting busy signals, I was continually bumped. During my year of "free" service, fees and charges were added to the area I frequented. When I asked "AOhell" how much time remained on my year of service, I received four different answers. I'm now surfing the Net with a more reliable ISP. I voted with my dollars. That's the best any consumer can do.

Lynn Conant, Internet

I CONTINUE TO BE amazed at how many users stay with AOL. When I ask my friends why, they always cite the ease of use and user-friendly content. But to me, that's akin to shopping at department store X because it has so much merchandise, even though it's closed

half the time, it has inconvenient hours, and sometimes the clerks stop your sale in the middle of the transaction.

*Laurence J. Lowy
Fairfield, Connecticut*



OTHER THAN those frustrating busy signals in January and February last year, I'm very pleased with AOL. I haven't encountered a busy signal in at least six months, and I receive timely e-mail, connect consistently at high speeds, and experience few freezes. My main complaint? Far too many advertisements for products I don't want or need.

George J. Kuta, South Bend, Indiana

I WAS APPALLED to see you found IBM Internet Connection the Best Overall ISP. With the IBM service, I typically experience

at least three disconnections per session. Web pages or file downloads frequently just stop midstream. An attempt to upgrade dialer software (at the suggestion of the company's tech support) was a nightmare. And its e-mail service, in my experience, has been unreliable: Its mail server reports that "mail has been delivered," but frequently my intended recipients say that they never received my messages.

While it is true that every problem is acknowledged promptly (via e-mail), IBM's follow-up and the accuracy of its tech support have been very poor.

If you can give IBM's "service" a top rating, then AOL's much-publicized problems are only the tip of the iceberg of unacceptable ISP service.

Ronald L. Watkins, Littleton, Colorado

Editor's note: Recent rate increases by AOL and IBM have inspired readers to flood our Letters mailbox with additional complaints. See this month's *Just In* for the latest news.



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► **The PC World Top 100:** The top power desktops, budget desktops, notebooks, and home PCs, plus printers, monitors, graphics boards, and modems.

► **Plug and Pray?** USB is the latest technology to promise no-hassle hookups between your peripherals and your PC. But recent tests found few successful connections. Et tu, USB?

► **Here's How:** Answer Line on buying brand-name or locally built PCs, *Internet Tips* on browser plug-ins, *Upgrade Guide* on installing a 56-kbps modem.

PC WORLD

computer between work and home.

Perhaps the proper term for what I'm seeking is *portable*, not *laptop*. The industry should recognize these two distinct categories. Marketing people need little computers that fit on airplanes. Engineers need big computers that can render 3D schematics of airplanes.

J. D. Wolf

Round Lake Beach, Illinois

THROW THAT OLD PC AWAY?

ACCORDING TO ROBERTA Furger's article ["Don't Throw That Old PC Away," *Consumer Watch*, January], the new tax law "allows qualifying businesses to deduct the full purchase price of any computer donated to a K-12 school within two years of purchase." This grossly exaggerates the law's benefit. The real situation is much more complicated.

First, the new law does *not* allow a deduction for the full purchase price of the computer. It allows a deduction for the *depreciated cost* of the computer, or, if fair market value is more than depreciated cost, then (see if you can follow this) a deduction for the computer's fair market value reduced by half the gain that would have been recognized if the computer had been sold for fair market value. So, if a corporation paid \$5000 for a computer and depreciated it 50 percent over two years, it would have a depreciated cost of \$2500. If the computer had a fair market value of \$1500 when it was donated (a likely scenario), the corporation would get a deduction of \$2500, not \$5000.

Second, Ms. Furger states the provision expires in four years (end of 2001). In fact, it expires in two years, at the end of 1999.

William D. Hughlett, Seattle

Author's response: The information as printed was taken directly from the office of Rep. Randy Cunningham (who introduced the bill) and, according to his legislative aide, was correct at the time. Details such as depreciation were added later in the process and dramatically reduced the usefulness of the final legislation. —Roberta Furger

THANKS TO ROBERTA FURGER for her article. A couple of years ago I was cleaning out our company's old computer

equipment. Most of it didn't work, but some of it was serviceable. Donate it? Goodwill Industries, St. Vincent De Paul, and the Salvation Army all either would not accept computers or would take only what was in working order. The computer training schools I called had similar restrictions.

I finally found a very small nonprofit organization here that was willing. They used our old parts to teach local residents how to build computers. Then they gave the computers to area families.

Pamala Leonard, Los Angeles

YOU'RE WELCOME

THANKS *PC World*! After reading "Store Wars" in your February issue, I followed your advice to pounce on price drops. I called Quantex and told them that my system was now cheaper, and they credited my card \$175, a whopping 10 percent off what I originally paid for the system!

Ben Marinic, Richmond, Virginia

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

CORRECTIONS & CLARIFICATIONS

• IN JANUARY'S "ISPs You Can Count On," the URL for MCI Internet was incorrectly printed; it is www.mci2000.com. We also said that for ISDN support, IBM Internet Connection charges \$6 per hour for 64 kilobits per second and \$12 per hour for 128 kbps. The actual rates are \$1 per channel-hour for 64 kbps and \$2 for 128 kbps (the service offers two channels).

• In "Too Much of a Good Thing?" (February), a number of typographical errors in the application scorecards caused minor changes in the final "Office Suites Report Card," so that Microsoft Office 97 Professional scored 8.1 out of a possible perfect 10, Lotus SmartSuite 97 scored 7.5, and Corel WordPerfect Suite 8 Professional came in third with 6.6. After adjusting the scores in error and recalculating, we determined that the correct final scores are: Microsoft, 8.1; Lotus, 7.4; and Corel, 6.8.

• The March *Got a Problem?* omitted contributing editor James A. Martin's byline.

PC World regrets the errors.

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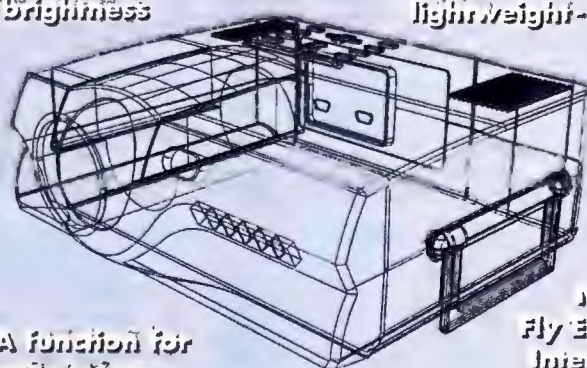
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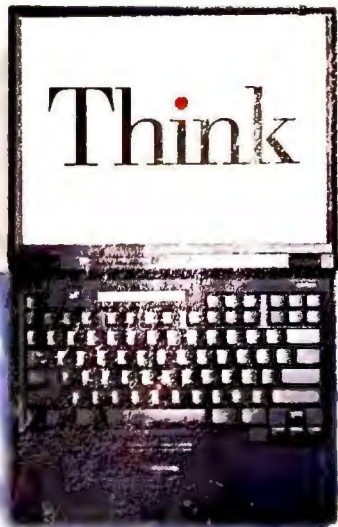


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Diamond Stealth 3D 3000 PCI	127
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Microsoft vs. You

Will consumers add their powerful voice to the growing anti-Microsoft chorus?



RALPH NADER WANTS the Microsoft software monopoly stopped. So do Attorney General Janet Reno, Utah Senator Orrin Hatch, and the attorneys general in some of the largest and most powerful states, including California, Texas, and Florida.

And so does Ed Knight, a land use planner in Ignacio, Colorado.

Nader, Reno, Hatch, and their compatriots need no introduction—when they speak, they get headlines. Together, they wield enormous power and influence—which they are marshaling in their efforts to check Microsoft's push to control the Web browser market and to

move into Internet content and commerce.

But in the end, the real power broker may well be Ed Knight and the millions of consumers like him who rely on Microsoft's products at home and at work.

"I don't feel it's good for a single company to dominate the industry the way Microsoft does," says Knight. "Competition breeds quality and excellence in products," he adds, "and that's especially critical given the extent to which government, business, and home users depend on computers."

Ed isn't alone. He's part of an increasingly vocal group that is beginning to chafe at the ever-tighter hold Microsoft has over the world of personal computing. Although the dissatisfaction is by no means universal, the grumbling is getting louder, and for the first time, consumer groups are poised to rally their troops.

NEW VOICES HEARD

THE DEBATE OVER what to do about Microsoft is nothing new. For years Microsoft's competitors in the computer industry have bemoaned the company's uniquely powerful position as keeper of the main PC operating system. State and federal law enforcement agencies have investigated the company time and again. But until recently the call for action was never heard outside this fairly limited circle.

Then Nader, Hatch, and a handful of relatively small consumer groups stepped in, alarmed by Microsoft's no-holds-barred campaign to make Internet Explorer the number one Web browser. Nader sponsored an unprecedented conference entitled "Appraising Microsoft and Its Global Strategy." Hatch spearheaded the Senate Judiciary Committee's examination of Microsoft's business practices. And NetAction (www.netaction.com), a consumer group in San Francisco, began still-fledgling efforts to organize consumers against Microsoft's attempts to control the browser market and Web content.

Along the way, the Microsoft saga moved from the business page to the front page of newspapers from Washington, D.C., to Seattle, Washington. Bill Gates versus Janet Reno and Co. became national news.

WHAT'S THE BIG DEAL?

CHOICE—THE ABILITY to decide which browser you want to use and what Web sites you want to explore—is what the Microsoft-Justice Department battle is all about. Over ►

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the last several years Microsoft has tried to limit consumer choices: It began bundling Internet Explorer with Windows 95 and offering the software for free to anyone willing to take the time to download it; it beefed up Internet development efforts; and it launched an aggressive plan to topple browser market leader Netscape Navigator through the promotion of Web sites optimized for Internet Explorer. Though Microsoft's agreed to let PC vendors sell Windows 95 machines without Internet Explorer, it's only a temporary setback.

Of course, Microsoft has never hesitated when it saw a market it wanted to capture. Why should you care that it's poised to control yet another software category?

There is, of course, the legal issue of whether a company can use its market dominance in one area (namely operating systems) to gain market share in another (browsers). That may be reason enough for lawyers and economists, but if esoteric antitrust issues of "tying" and "leveraging" don't move you, consider this: The browser is the lens through which each of us—consumer and business users alike—will view the wealth of resources available online. It's how we'll check NASDAQ quotes or sports scores. It's how we'll buy books and cars or make travel reservations. It's how we get information.

Shouldn't consumers be able to choose how they perform these activities?

Even many consumers who prefer Internet Explorer believe Microsoft shouldn't impose its browser on consumers. Says Terry McClelland, a computer operator in Fontana, Kansas, "I use Internet Explorer, so I wouldn't be put out to have it included with a Windows package." But he adds, "I think there should be an option button [to remove it] for those who don't want it."

CONSUMER POWER

NETACTION IS TRYING to galvanize these consumers through a grassroots campaign, urging PC users to write Con-

gress and the Justice Department in support of their current investigations, as well as send letters to their local newspapers to raise public awareness of the issues. While recognizing that a boycott of Microsoft products is out of the question, NetAction is urging consumers to use

non-Microsoft products "whenever possible."

But NetAction's efforts have gone largely unnoticed by consumers. As of this writing, at least, the group hadn't succeeded in launching a full-scale consumer movement.

Nader and his watchdog group, the Consumer Project on Technology (www.cptech.org), could play a critical role in spurring consumers to action, but instead it has focused its initial efforts on educating state and federal governments and policy makers on the intricacies of Microsoft's position in the industry.

But CPT director Jamie Love isn't ruling out more direct consumer involvement, listing legislation, business conduct rules, government procurement strategies, and grassroots consumer campaigns as possible options. "We need to ask what [type of action] makes sense," says Love.

THE EMPIRE STRIKES BACK

MICROSOFT IS FIGHTING back in a big way. Chairman and CEO Bill Gates wrote an editorial for the *Wall Street Journal* and countered the government and Nader's arguments during an appearance at the National Press Club. The company commissioned a survey to determine how consumers feel about government regulation of the software industry. The press section of its corporate Web site devotes much space to "Refuting the Myths" ostensibly perpetrated by the Justice Department, Nader, Hatch, and others. Microsoft hired a full pack of top-dollar Washington lobbyists as well.

The company isn't without its supporters. In a press conference convened at the same hotel as Nader's November meeting, a group of developers and customers distributed buttons and stood in front of ►

Even many consumers who prefer Internet Explorer believe Microsoft shouldn't impose its browser on consumers.

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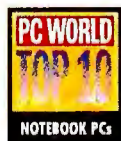
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a hastily crafted sign reading, "Ralph Nader doesn't speak for me."

"The parties represented by the Nader conference are out of touch with consumers on these issues," asserts Charles Kelly, president of the Worldwide Association of NT Users Groups, Inc., based in Washington, D.C. Ted Johnson, executive vice president of product development and chief technology officer for software maker Visio Corporation, agrees: "Microsoft defines innovation and competition."

Still, Microsoft's hard-nosed approach to its legal battle with the Justice Department isn't earning it many fans. But as William Neukom, Microsoft's senior vice president for law and corporate affairs, told the *New York Times*, "Sometimes you have to take positions in legal cases for a larger purpose, even if it does give you public relations problems."

THE COURT OF PUBLIC OPINION

WHILE THE LAWYERS fight it out in court, it's time for consumers to speak out. It wouldn't be the first time PC users have joined forces in opposition to a company's business practices (witness the class-action suits against Packard Bell over used parts and against Compaq for problems with the Presario line).

The issues in the Microsoft case are not as clear-cut as questions of false advertising or faulty products, to be sure. But the outcome of this controversy is likely to have profound consequences for the way we all view and use the Web—and the world of information and opportunities that it represents.

Got a consumer gripe? Tell us by e-mailing consumerwatch@pcworld.com. Roberta Furger is a PC World contributing editor. Her first book, *Does Jane Compute? Preserving Our Daughters' Place in the Cyber Revolution*, is available from Warner Books.

TELL US WHAT YOU THINK



ARE YOU TIRED of leaving the Microsoft debate to the press and the pundits? Add your voice by logging on to PC World's Microsoft-related Web page at www.pcworld.com/april98/msfeedback.

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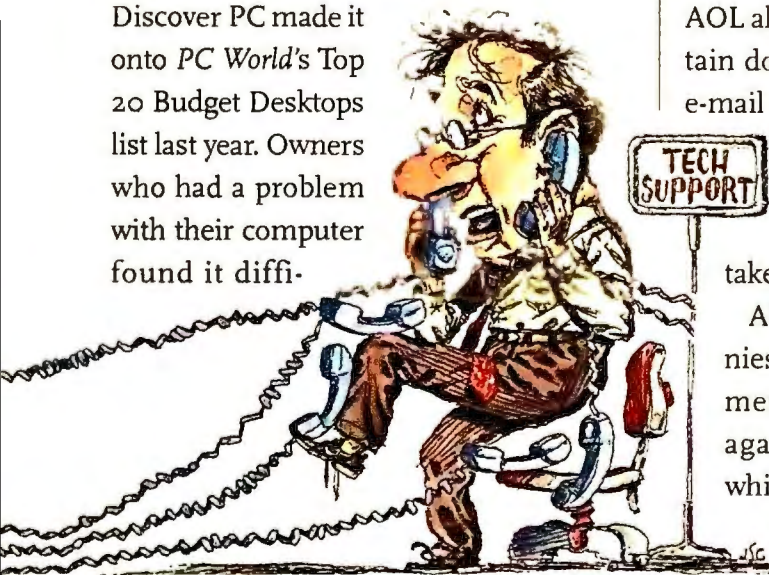
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LG Electronics

Angry ProGen buyers ♦ AOL's porn plague ♦ Internet rip-off? ♦ IMSI's recall

ProGen's Success Is Bad for Customers

SOMETIMES A COMPANY'S good fortune can be bad news for consumers. Take ProGen Systems. I've heard from dozens of readers who bought a new ProGen computer after the company's low-priced Discover PC made it onto *PC World's* Top 20 Budget Desktops list last year. Owners who had a problem with their computer found it diffi-



cult or impossible to reach the company to get their problem resolved.

Peter Chen, ProGen's director of operations, said that sales in 1997 vastly exceeded the company's projections. As a result, the tech support department was unable to keep up. In the past several months, ProGen has quadrupled its tech support staff and installed an automated voice response system. At press time, the tech support department was still jammed, but Chen expected it to be back on track by the time you read this. If you're having trouble contacting the company, try sending e-mail to techmaster@progen.com. Chen says that's the easiest way to get through.

THE SMUT IS IN THE MAIL

LOTS OF PEOPLE wrote to me about junk mail, particularly pornographic stuff, coming into their e-mail boxes. Peter Tal of Greenvale, New York, said he believed that America Online was selling his name to companies that then pelted him with

e-mail. Not so, says Tricia Primrose, a spokesperson for AOL. She tells me that AOL doesn't sell e-mail addresses, and tries to keep spam out of its system by blocking e-mail from known spammers. AOL also lets users block e-mail from certain domains or individuals, and accept e-mail sent only from an approved list of people. Because spammers still find clever ways around such roadblocks, the company has taken its battle to the courts.

AOL has sued a number of companies that refused to stop spamming its members. It recently won a case against Over the Air Equipment, which was sending ads for porn sites to AOL subscribers, obtaining a "large but undisclosed" amount of money in damages, Primrose says. "We hope this will be a deterrent to other companies." (See also *Got A Problem?* in this issue.)

INTERNET SHOPPING DANGER

I'VE BEEN TRYING to help a few readers resolve problems they had with Global Shopping Club, a Net-based components

dealer. The South Dakota attorney general's office has ordered the company to halt business until the state's court case alleging deceptive trade practices is resolved. I couldn't reach the company for comment—GSC's Web site is gone, and the phones are disconnected. And the attorney general refused to comment because the case is going to court. If you have a dispute with Global Shopping Club, contact the South Dakota attorney general's office at 605/773-4400.

IMSI ON TRIAL

A FRUSTRATED Michelle Senter of Lubbock, Texas, reports that she bought a copy of IMSI's WinDelete from her local software store. But when she tried to install the program, Senter got a message that her trial period had ended. What gives? IMSI's Jonathan Freel says the company goofed. Last summer IMSI accidentally shipped 3000 trial versions of WinDelete packaged as if they were the full version. Most of the mistakes went into a bundle (Synchronys Softcorp's Utility Belt). IMSI recalled most of the bad units from distribution, but some made it to the shelves and to consumers. If you have one of the trial versions, you can call 800/833-4674 to get it replaced.

Think you've gotten a raw deal—or a great one? PCW Advocate wants to hear the details at advocate@pcworld.com. We'll investigate complaints and publish items of the broadest interest. Christina Wood is a contributing editor for PC World. ■

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You've Got Junk Mail

Junk mail clogging your in-box? Don't get mad, get even. Researcher James Cooley tackles the spammers.



PROBLEM You're drowning in unsolicited e-mail messages.

SOLUTION Filter your incoming e-mail, contact your Internet service provider, and hunt down the culprits.

WANT TO MAKE \$1500 a week stuffing envelopes? Learn how to foretell the future? Make moonshine in your kitchen? Everything you need may be as close as your e-mail in-box. Unsolicited, bulk-distributed messages are clogging the Net. They can paralyze your Internet service provider's mail system, tie up your modem, and just plain get on your nerves.

Ask James A. Cooley, a self-employed researcher, government policy analyst, and writer in Austin, Texas. Cooley is one of the countless unhappy recipients of junk e-mail. Cooley says he relies heavily

on the Net and e-mail for his business, yet nearly three-fourths of the daily messages he receives are of the unsolicited, commercial variety.

"Junk e-mail is all punishment and no reward," says Cooley. "Spam threatens the reliability of my Internet service. It sends unwanted porno advertisements into my home. But most of all, it's a big waste of my time."

While the spam onslaught can seem overwhelming, you can do a number of things to control it. Here are some strategies, provided by Cooley and Ray Everett-Church, an independent Internet consultant in Washington, D.C., and cofounder of the Coalition Against Unsolicited Commercial Email, an antispam organization.

SET UP FILTERS

FIRST, TRY TO MANAGE the influx. Most e-mail programs allow you to set up filters that will scan an incoming message's domain name, subject heading, text, and other elements. Cooley says that he has set up Netscape Communicator 4.0 to automatically direct any incoming mail containing 'XXX' in the body of the message into a folder called Junk Mail. With that filter, Cooley says, he's able to weed out pornographic spam.

"Most of the time," Cooley adds, "filtering works well. At the end of the day, I look in the Junk Mail folder before deleting the contents to make sure a legitimate e-mail didn't accidentally wind up there." Cooley says a message from his mother-in-law to his wife once went into the Junk Mail folder because it contained a string of Xs at the end—in this case, signifying kisses.

"I've also found that an effective way to filter is by subject headings," Cooley says. "I've set up Communicator to filter e-mail with subject headings such as Perfectly Legal, Make Money Fast, and so on. That gets rid of a lot of junk."

To create filters in Communicator 4.0, go to the Message Center and select *Edit-Mail Filters-New*. Type in a name for the new filter, such as **hot porn**; enter the keywords you want to check for (in this case, **hot porn**); select the action you want the filter to perform on new messages (such as move them to a particular folder). Then click OK to close the dialog box.

Microsoft Explorer 4.0 is automatically set up to use Outlook 97 as an e-mail reader. To filter incoming mail, go to Outlook's *Tools* menu, select *Inbox Assistant*, click *Add*, type the criteria you want incoming messages to match (such as **XXX**), then click the folder where you want

GOT A PROBLEM?

the matching incoming messages sent.

If you use the e-mail package Eudora, see @Home Office in our March issue.

TAKE OTHER MEASURES

BUT FILTERS ON your PC can do only so much. Everett-Church advises asking your ISP exactly what steps it's taking to filter out spam. For instance, many smaller and regional ISPs subscribe to the Realtime Black Hole List, a regularly updated UNIX-based database containing information about known spamming sites. An ISP's servers can use this data to automatically block junk e-mailers' access. Says Everett-Church, "It's a fairly intricate, sophisticated way of using information about junk mail abuse to protect others."

Most junk e-mail marketers include instructions in their messages (often buried at the bottom) on how to remove yourself from their lists. Scrupulous bulk mailers honor your requests, Everett-Church says, while others ignore them or, worse,

send even more spam to your in-box.

Don't respond with anger or obscenities, says Cooley. "The worst spammers often hide behind forged IDs. Some even made it appear that their messages came from America Online officials." So your angry response may go to an innocent bystander.

The best way to respond to a particularly irksome spam is to track down the actual sender. Forged domain names and e-mail addresses make it tricky to identify a spammer, so Cooley uses Sam Spade, a freeware program available on PC World Online, to decipher the messages' origins.

The utility is easy to use and can quickly identify the ISP a message was sent from, Cooley says. Armed with that information, he sends a copy of the offensive mail directly to the originating provider as well as to the ISPs that passed it along.

Usually, Cooley explains, all you have to do is address your complaint to postmaster@ISP name.com, or abuse@ISP name.com. Says Cooley, "If you show them evi-

dence that a spammer is going through their service, they may kick the spammer off or, in some cases, sue."

JUST DELETE

OF COURSE, the easiest way to get rid of spam is to delete it. "But if we all just deleted those messages, where would it end?" Cooley wonders. Instead, he urges others to go after spammers aggressively. Cooley also suggests telling your legislators how you feel about the problem.

"The Internet has helped me be self-employed," Cooley says. "It's a wonderful tool, and I'm going to fight to keep it."

For more tips, visit www.pcworld.com/apr98/gap. Find files from this article at www.fileworld.com. If you're having trouble resolving a PC-related hardware or software problem, we'd like to hear about it. See page 14 for contact information. James A. Martin is a PC World contributing editor.

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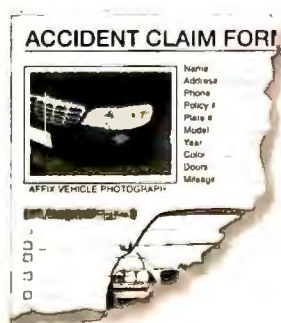
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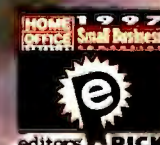
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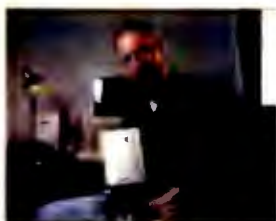
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Severence MacLaughlin
Student, Cornell University
Ithaca, NY

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Antonio Pasin
Radio Flyer, Inc
Chicago, IL

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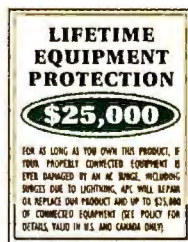
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First Aid 98 needs help ♦ Check your tax software ♦ New browser bugs

First Aid 98 Gets a Little First Aid

CYBERMEDIA'S POPULAR First Aid 98 utility is supposed to keep your PC trouble-free by finding and fixing Windows 95 configuration errors, conflicts between applications, and even Internet connections that don't connect. But any program that tries to untangle the Gordian knot of Windows 95 is doomed to less than 100 percent success. Throw in a copy of Internet Explorer 4.0, and all bets are off.

If you install IE 4.0 before installing First Aid 98, the utility won't load correctly. The problem? First Aid 98 uses Internet Explorer to display its HTML-based interface, and even ships with a copy of IE 3.02. Unfortunately, in version 4.0 Microsoft changed the way IE handles links, leaving First Aid without an interface. Another problem is CyberMedia's fault: First Aid makes IE your default browser and leaves it that way, even if you prefer Netscape Navigator or another product.

As we went to press, CyberMedia had posted a fix that upgrades the original shrink-wrapped version of First Aid 98, version 5.0, to 5.02. In addition to solving the problems described above, the 5.02 update expands the utility's repertoire of fixes and smooths program navigation. A 4.3MB patch (<ftp://cybermedia.com/updates/fa98/us-english/fa502cor.exe>) contains just the bug fixes and program enhancements. A 7.6MB patch (<ftp://cybermedia.com/updates/fa98/us-english/fa502ful.exe>) also includes a more extensive database of Windows configuration solutions.

TAXES KEEP GOING UP

BEFORE YOU SEND your tax return to Uncle Sam, be sure to patch your tax software. In years past, all of the several tax-preparation programs suffered from minor bugs, and manufacturers usually released fixes well in advance of the April 15 deadline.

This year, only two tax programs remain: Intuit's TurboTax 97 and Block Financial's Kiplinger TaxCut. As we went to press, both companies had discovered a handful of obscure bugs unlikely to bother most filers. For TurboTax, check www.intuit.com/support/turbotax/updates/1997/win/turbotax.html, or load the program and choose *Help•Product Updates*. For TaxCut, see www.taxcut.com/techsupport/updates/index.htm.



I N B R I E F

Microsoft Releases Two Flight Simulator 98 Patches

IF THE LATEST version of this aviation classic tells you it needs 4096MB of free disk space for installation, get the 2.9MB Setup Patch (ftp://microsoft.com/deskapps/games/public/flightsim/FS98ptch_USOnly.exe). The 801KB Patch Set 1.0 fixes countless small instrument, control, and aircraft glitches (<ftp://microsoft.com/deskapps/games/public/flightsim/fs98pat1.exe>).

Stay Safe in Quake II

ONLINE QUAKE WARRIORS will want to download the 1.1MB Quake II v3.10 patch (<ftp://idsoftware.com/idstuff/quake2/q2-310.exe>), which beefs up server security and adds support for Xoan Industries' QHost/Qview online gaming add-ons.

BROWSER BUGS FOR 1998

SO YOU WERE hoping 1997 was the year they ironed out all the bugs, instabilities, and security holes in your favorite browser? Dream on. By mid-January, a new Internet Explorer security hole had already cropped up. Dubbed the MK Overrun issue, it affects IE versions 4.0 and 4.01 running under Windows 95 or NT; it also afflicts version 3.02 if you have Microsoft's Visual Studio installed. Like the Buffer Overrun bug reported in the February issue, the MK Overrun security hole allows Web hackers to crash your system, or worse, execute malicious programs on it by shoe-horning them into hyperlinks.

Because IE 4.0's code doesn't belong just to the browser, the flaw extends to Outlook Express and Windows' Explorer user interface. Internet Explorer's Security Zones won't protect you from pages written to exploit the flaw, which overloads the proprietary mk: URL type used by IE 4.0's Help System and Visual Studio's InfoViewer. To close the hole, download a patch for either IE 4.01 (280KB) or 4.0 (278KB) from www.microsoft.com/msdownload/ieplatform/IE4mkbuff/mkbuff.htm.

Meanwhile, Netscape confirmed that a flaw in Navigator 4.04's JavaScript system allows cleverly written Web pages to close the visiting browser's navigation toolbars or other windows without first asking the user's permission. Though the flaw doesn't allow access to the browser user's data or crash the system (which can also cause data loss), it could be a time-wasting annoyance. A Netscape source says a fix will be included in an upcoming 4.05 release. At press time, Netscape had no release date; to upgrade your copy, choose *Help•Software Updates*.



Files from this article are available on PC World Online at www.fileworld.com. Scott Spanbauer is a senior associate editor for PC World.

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TOP OF THE NEWS

How Low Can PC Prices Go?

\$799 and Sinking

New CPU designs,
cheaper
components, and
increased
competition have
pushed PC prices
lower than ever.
But is an \$800 PC
good enough
for you?



THE HOT NEW trend in PCs—fully configured computers from major manufacturers for under \$800—may seem like an inexpensive time-share in Florida or a \$300 round-trip to Paris. It sounds great, but there's got to be a catch.

In fact, there are several. For starters, the \$799 price tags don't include a monitor. More important, *PC World* lab tests found that most of the new sub-\$800 machines deliver pedestrian performance, due to less-than-cutting-edge processors and small or non-existent secondary caches.

COMPROMISES

THE FOUR under-\$800 PCs we tested earned an average PC WorldBench score of 213,

compared to an average score of 252 for systems that cost about \$2000 to \$2499. There are other compromises as well, such as limited expandability, 2D-only graphics chips in two of the systems, and in one case a shorter period for free technical support.

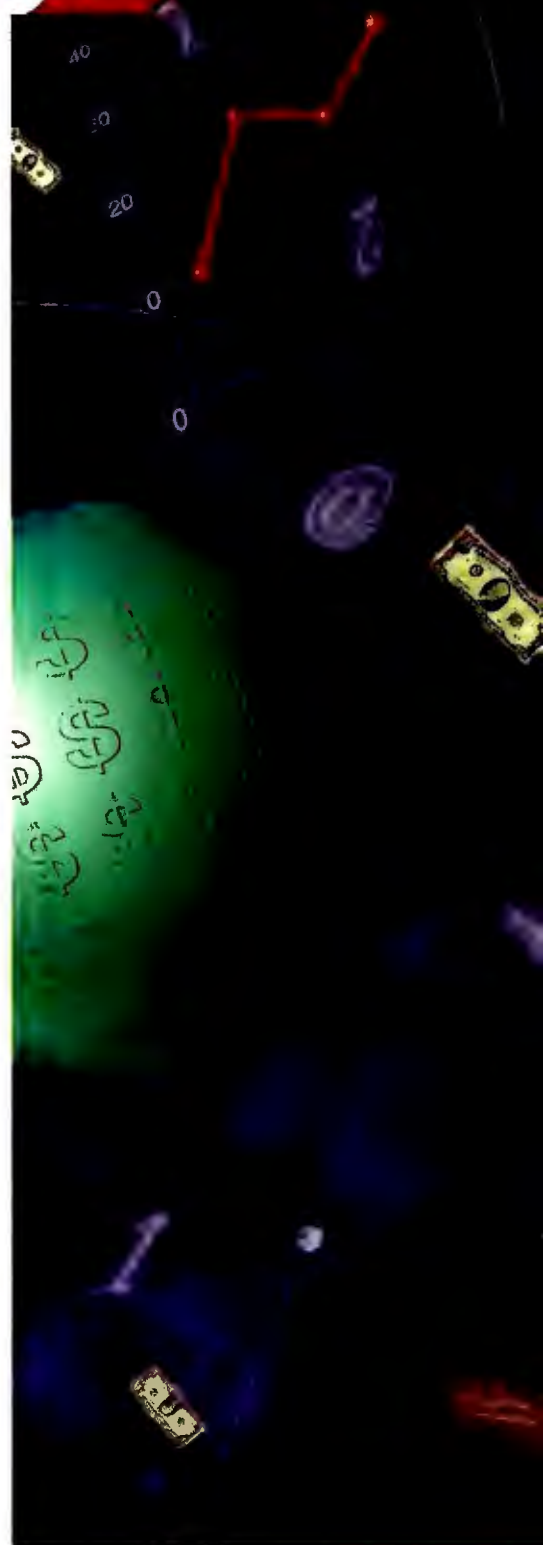
Nevertheless, our hands-on tests (see "Decent Performance for Under \$800") convinced us that these machines are worth serious consideration—by some people. First-time buyers on a budget, home users in need of an additional computer, and organizations with large administrative

staffs may find that the sub-\$800 PC is a good value and should be just fine for basic computing tasks.

What's more, the downward trend in PC prices isn't expected to stop here. According to a variety of computer vendors, chip manufacturers, and industry observers, fully configured PCs could sink to the

EDITED BY

Charles Piller, Randy Ross,
and Bill Snyder





AOL and IBM Increase Online Fees

STARTING IN APRIL, America Online's unlimited access plan will cost \$21.95 per month—a \$2 increase. Also, IBM Internet Connection, one of the top Internet service providers as rated by *PC World* for the last two years, announced that starting April 1 it will no longer offer unlimited Internet access for \$19.95 per month. The \$19.95 monthly fee will cover 100 hours of access, with each additional hour costing \$1.95.

DEC Update

THE PROPOSED MERGER of Compaq and Digital Equipment Corporation, if it goes through, could yield some product casualties. Dataquest analyst Nathan Brookwood expects Compaq to continue Digital's workstation and HiNote notebook lines but possibly fold Digital's desktop business. Meanwhile, Digital announced a new Alpha chip family, the 21264 series, that will run at 600 MHz and, later, 1000 MHz. The first 21264 processors will likely appear in Digital workstations by summer. Brookwood believes that the 21264 series won't break the 1000-MHz barrier until 2000; by then Intel's x86 and IBM's PowerPC chips will also approach that speed.

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\$500-to-\$600 range later this year and may even drop as low as \$300 by late 1999.

CHIP WARS DRIVING PC COSTS DOWN

PACKARD BELL was first to break the \$800 price barrier, and was followed by Acer America, Compaq, Gateway 2000, Hewlett-Packard, IBM,

SOMETHING MISSING? Sure—monitors. But at about \$800, these PCs still offer good value. Above (clockwise from left) are PCs from IBM, Kingdom, Hewlett-Packard, Acer, and Compaq.

and Kingdom Computers.

How can prices drop so fast? Lower costs for memory and hard drives help a lot. But

competition among the vendors who make the CPUs is the real driving force. Intel, which dominates the market, has had to cut prices faster than ever before as Advanced Micro Devices, Centaur, and Cyrix all push their chips into low- and ►

DECENT PERFORMANCE FOR UNDER \$800

SYSTEMS	CPU	RAM (MB)	Secondary cache (KB)	PC WorldBench score	Faster	Test times	Slower
Acer Aspire 1824	AMD K6-233	32	256	225			
HP Pavilion 3260	Pentium MMX-200	32	—	195			
IBM Aptiva E16	AMD K6-166	16	256	205			
Kingdom Pinnacle PR166MX	Cyrix 6x86MX-PR166	32	512	226			
Average of 4 desktops	Pentium II-233	32	512	248			
Average of 6 desktops	Pentium MMX-233	32	256	230			
Average of 11 desktops	Pentium MMX-200	32	256	213			
Average of 2 desktops	Cyrix 6x86-PR166	32	512	207			

Minutes 0 10 20 30

Word 7.0 for Windows 95
 Picture Publisher 6.0 for Windows 95
 WordPerfect 6.1 for Windows

Excel 7.0 for Windows 95
 Paradox 5.0 for Windows
 1-2-3 release 5 for Windows

How We Test

Business applications: We tested all systems with PC WorldBench, PC World's Windows 95 application-based benchmark. Higher PC WorldBench scores are better. For a description of PC WorldBench 1.0 tests, see PC World Online (www.pcworld.com/testing).

Data based on testing conducted by the PC World Test Center. All rights reserved.

Pinnacle PR166MX Super Value, it looks like the computer makers resisted the temptation to build shoddy machines. But feature sets are another story.

TODAY'S \$799 PC

HERE IS WHAT YOU can expect to find in the current crop of bottom-dollar PCs:

■ **Poor to adequate performance.** If you're looking for top-flight performance, keep looking. With an average PC WorldBench score of 213, the systems we tested lag far behind the cutting edge. One reason: too little secondary cache in some.

midrange-priced systems.

In addition, many computer makers have subcontracted the manufacturing and distribution of low-end PCs to reduce costs. IBM farms out the manufacture of its low-end Aptiva PCs to Acer Computer

in Taiwan, but continues to build midrange to high-end PCs at its own facilities.

Does this mean that \$799 PCs aren't held to the same manufacturing standard as more expensive systems? Not at all. Vendors insist that their

low-cost machines are put through the same quality control checks as any other computer. Based on our tests of the sub-\$800 Acer Aspire 1824, HP Pavilion 3260, IBM Aptiva E16 (see also this month's *Top 10 Home PCs*), and Kingdom

Can a \$797 PC Steal Your Heart?

A BRAND-NEW PC for \$797? The very concept sounded cheesy to me, as if such a machine would be advertised only in late-night infomercials. But after a few days using Kingdom Computers' new Pinnacle PR166MX Super Value, I was in love—almost.

DELL VS. KINGDOM

A FEW MONTHS ago I paid \$3000 for a top-of-the-line Pentium II-300, and I was curious to see how the Pinnacle compared. My Dell Dimension XPS D300 has it all: 300 screaming MHz, 512KB of secondary cache, 96MB of SDRAM, an 8.4GB EIDE hard drive, an STB NVidia AGP graphics card with 4MB of video memory, an

internal Zip drive, a 14X-32X CD-ROM drive, a 17-inch monitor, and Microsoft Office 97.

The Kingdom Pinnacle PR166MX Super Value, by comparison, comes with a relatively slow Cyrix 6x86MX-PR166 processor, a mere 32MB of SDRAM, a 1.7GB hard drive, a Hercules 64-bit 3D video board with 2MB of memory, no Zip drive, a 24X-max CD-ROM drive, and Microsoft Works. It doesn't come with a monitor, so I added Kingdom's \$199 15-inch display, bringing the cost of the system to \$996. Could it meet my needs? I didn't think so, but for

nearly a week it was *my* PC, and I gave it every chance.

Surprisingly, the performance of the two machines felt similar. I noticed that the Pinnacle hesitated for a second or two when opening big files, something that my Dimension never does. The Pinnacle's video clips were jerky, with some slight pixelation—problems I rarely encounter on the Dell. But when I was Web surfing, word processing, using e-mail, or balancing a checkbook, the Pinnacle held its own. In short, for day-to-day productivity tasks I saw little difference between them.



Did I feel buyer's remorse? You bet. But the feeling was fleeting. I found I couldn't live without my Zip drive or big, crisp Dell monitor. And I wouldn't want to be stuck with Microsoft Works.

MY TRUE LOVE

BUT WHAT REALLY saved the day for Dell were my future needs. Web sites are getting more graphics-heavy, and videoconferencing and speech recognition demand a lot of system resources. Will the Pinnacle be able to manage those and other technologies just around the corner? Not likely. Instead, I'd need a brawnier (and more expensive) PC equipped to handle anything I could throw at it over the next few years—and that kind of power is something I'm just not willing to give up. —J.A.M.

The HP Pavilion 3260, for example, is the only PC we tested with a Pentium chip, yet it came in last in our speed tests. The Pavilion has a Pentium MMX-200 processor but no secondary cache—a cost-saving measure that contributed to its low PC WorldBench score of 195. Kingdom Computers' Pinnacle PR166MX Super Value, with a Cyrix 6x86MX-PR166 processor, had the most cache of any system we tested—512KB—and landed in first place with a PC WorldBench score of 226.

■ **Adequate memory.** Three of the four PCs we tested have 32MB of RAM, but the IBM Aptiva E16 comes with a paltry 16MB. You can upgrade three of the systems to 256MB of RAM; the Acer Aspire maxes out at 128MB—but that's still more than enough RAM for the kinds of tasks you'd want to do on this class of machine.

■ **Basic multimedia and graphics.** The four PCs we tested came equipped to handle workaday multimedia by relying on older or more limited components. HP's Pavilion 3260, for instance, includes a 16X CD-ROM drive (more expensive PCs sport 32X-maximum CD-ROM and DVD drives); 1MB of video memory, upgradable to only 2MB; and an ATI 26VT2 graphics processor, which is now about two years old and doesn't provide 3D graphics acceleration. Because Kingdom's Pinnacle and IBM's Aptiva come with 3D graphics adapters and 2MB of video memory, they did the best job of handling games; we didn't perform any other

multimedia testing, however.

■ **Limited storage.** Most PCs sold today include 4GB or larger hard drives. Three of the PCs we tested had 2GB drives; the Kingdom came with a 1.7GB drive.

■ **Limited expansion.** To save on manufacturing costs, most



Intel is planning to ship **266-MHz** and **300-MHz** Pentium II-class processors designed specifically for the **sub-\$800 PC** market.

sub-\$800 PCs offer just a few add-in card slots and drive bays. The most expandable PCs we tested were the Aptiva, a minitower, and the Pinnacle, a midtower. The least expandable was the Pavilion 3260, with only one free shared ISA/PCI slot and no available drive bays. Along with fewer open slots and bays, the compact design of some systems makes them difficult to expand. A modem card, for example, blocks the Acer Aspire's memory slots.

■ **Less powerful productivity software.** The HP, IBM, and Kingdom systems include Microsoft Works, while IBM's Aptiva features Lotus SmartSuite. Microsoft Office? Nope.

■ **Mixed service and support policies.** In most cases, computer makers back the sub-\$800 PCs with the same warranty and technical support

included with their more expensive boxes. We found exceptions, though: HP's Pavilion 3260 has 30 days of free phone support, while pricier Pavilion 8200 models are backed by 90 days. And Acer's 1824 lacks the 90-day on-site repair warranty you get with Acer PCs costing over \$1000.

TOMORROW'S \$799 PC

BY THE SECOND half of 1998, new semiconductor manufacturing processes will drive PC costs even lower. AMD, Cyrix, and Intel have already started moving to a process known as

.25 micron, which can nearly triple the number of processors that one silicon wafer yields.

At the same time, semiconductor makers are developing chips specifically

for high-powered, low-cost PCs. This year AMD is designing higher-performing K6 chips for PCs in the \$799-to-\$999 range, says David Somo, K6 division marketing manager. The current sub-\$800 systems use K6 chips ranging from 166 to 233 MHz. By midyear, most \$799 K6-based PCs should be using 233-MHz CPUs, and 266-MHz systems will be available by Christmas, Somo says.

Rather than just cut prices on older chips, Intel plans by later this year to ship 266-MHz and 300-MHz Pentium II-class processors designed for sub-\$800 PCs, according to company spokesman Manny Vara. To reduce costs the new PIIs will use different packaging, and the first chips will lack a secondary cache, hurting performance. Subsequent versions due by year-end will have a ►

Notes 5.0 Preview

THE NEXT VERSION OF Lotus Notes, scheduled to ship in the second half of this year, will offer a slew of improvements, including major changes to the interface. Among the most notable enhancements are a bar on the left side of the screen that groups related messages, appointments, Web page links, and discussion links; a Headlines opening screen that looks like a Web browser and displays important e-mail, calendar items, links to databases, and Web links; and browser-style navigation buttons for such functions as back, forward, and reload. The product will also have new features for finding, sharing, and managing company data, including sophisticated search, chat, and whiteboard tools.



TidBytes

Aptiva Owners Sue Big Blue: Class-action lawsuits accuse IBM of deceptive trade practices and other charges in connection with older PCs that include a sound and modem card based on IBM's Mwave technology. The computers have had problems including system crashes. For more information, e-mail the plaintiffs' lawyer, Gary Weinstein, at gpwein@aol.com. **Microsoft's New Web Site:** Code-named start.com, the site will offer free Web-based e-mail accounts and integration with Microsoft's other consumer-oriented sites such as MSNBC, CarPoint, Investor, and Expedia. Launch is expected by the end of the year.

What You Get—and Don't Get—for \$799

	Pay \$799 and get...	Pay \$999 and get...	Pay \$1000-\$1499 and get...	Pay \$1500-\$1999 and get...	Pay \$2000-\$2499 and get...
Performance (PC WorldBench score)	195-226	200-220	200-240	233-250	260-270
CPU	6x86MX-PR166 or K6-166 to K6-233	Pentium MMX-200 to K6-233	up to Pentium MMX-233 or K6-233	Pentium MMX-200 to Pentium II-233	Pentium II-266 or Pentium II-300
RAM (MB)	16 or 32	16 or 32	16 or 32	32	32 or 64
Secondary cache (KB)	0, 256, or 512	512	512	512	512
Hard drive capacity (GB)	2	2.1	2.7	3.6	4.7
Graphics adapter	basic 2D or 3D PCI card	basic 2D or 3D PCI card	integrated 3D	PCI 3D card	PCI or AGP 3D card
Video RAM (MB)	1 or 2	2	2 or 4	4	4
Monitor (inches)	none	14	15	15 or 17	17
CD-ROM drive	12X-24X	12X-24X	12X-24X	12X-24X	14X-32X
Modem (kbps)	33.6, 56	33.6, 56	none, 33.6, or 56	none, 33.6, or 56	56
Warranty for parts/labor (years)	1/1	3/1	3/2	3/2	3/2 or 3/3
Weekday toll-free support (hours)	10-24	9-24	9-24	12-24	12-24
Weekend support	none or Sat., Sun.	none or Sat., Sun.	Sat., Sun.	Sat., Sun.	Sat., Sun.

secondary cache built in.

Cyrix's low-cost strategy is to integrate as many functions into its Media GX processor as possible, says Stan Swearingen, senior director of marketing for National Semiconductor's Cyrix division. Current Media GX processors have built-in graphics and audio controllers. By year-end, Media GX chips are expected to integrate a modem and ethernet interface as well. With so many features built into the processor, Swearingen says, Cyrix-based PC vendors should be able to sell fully configured PCs for as low as \$500 to \$600 by Christmas 1998 and \$300 by late 1999.

Meanwhile, Cirrus Logic has developed an integrated multimedia chip set designed to work with current and

upcoming CPUs from Intel, AMD, and Cyrix (with some exceptions). Cirrus Logic's architecture combines 3D



If you plan to use **resource-intensive applications** like videoconferencing, you'd be **better off buying** a more powerful computer.

audio and video, video-out support, and a 56-kbps modem, says Frank Greer, director of Cyrix's design center in Greenville, South Carolina. This summer, Greer says, expect to see \$799 PCs com-

plete with a CD-ROM drive, AGP graphics, a 2.1GB hard disk, 32MB of memory, and 2MB to 4MB of video RAM using Cirrus Logic's architecture. And look for a higher-end box offering DVD and TV tuner support for \$999.

BUY NOW-OR LATER?

GIVEN THE limitations of current under-\$800 PCs and the

promise of more powerful low-cost systems on the horizon, does it make sense to buy now? Yes, if budget considerations are at the top of your list and you need a PC

immediately that can handle basic computing tasks like business productivity applications and Web surfing. If that's your situation, a sub-\$800 computer is one of the best bargains you can find

today. But if you plan on using voice recognition, videoconferencing, image editing, Web design, or other resource-intensive applications, you'd be better off buying a more expensive, powerful, and expandable system now—or waiting until later in the year for a more muscular under-\$800 system.

—James A. Martin

• **Acer Aspire 1824** \$799 street; Acer America Corp.; 800/733-2237; www.acer.com/acer

READER SERVICE NO. 744

• **HP Pavilion 3260** \$799 street; Hewlett-Packard; 800/724-6631; www.hp.com

READER SERVICE NO. 745

• **IBM Aptiva E16** \$799 street; IBM; 800/426-7235 ext. 4340; www.pc.ibm.com/us/aptiva

• **Kingdom Pinnacle PR166MX Super Value** \$797 street; Kingdom Computers; 800/488-1122; www.kingdomcomputer.com

READER SERVICE NO. 746

Intel Inside Graphics Boards Makes AGP Zoom



HAVING STAKED claim to much of your PC's guts—from the CPU and supporting chip set to the motherboard itself—Intel is now eyeing the graphics system with its first desktop graphics chip, the Intel740.

Early indications point to an impressive debut. Several major graphics board vendors, including Diamond Multimedia, Number Nine, and STB Systems, say they will sell 2D-3D boards based on the Intel740; Intel can also put the chip directly on motherboards. And Chips & Technologies, a provider of graphics chips for notebooks, is now part of Intel. Does all of this mean that smaller chip makers will be run out of town?

GOLIATH, MEET THE DAVIDS

NOT LIKELY, says Dataquest senior analyst Geoff Ballew, who notes that—unlike the CPU market, where Intel faces



AS REAL AS IT GETS: The StarFighter AGP board made this scene from a Redline Racer beta come to life, down to the sun-glare effects.

only a handful of competitors—the graphics chip business has more than 30 players. “There will still be lots of competition for users to choose from,” Ballew says.

In fact, graphics giants ATI and NVidia both have new 2D-3D chips coming out shortly. And serious 3D gamers are still better off with an add-in board based on a 3D-only chip such as 3Dfx's Voodoo2.

INTEL IN ACTION

THE FIRST Intel740-based board to market will be the StarFighter AGP from Real 3D, a former Lockheed-Martin division that is partly owned by Intel and helped design the chip. A preproduction unit with 4MB of SGRAM turned in the fastest Accelerated Graphics Port board scores we've seen (see chart). It rendered AGP scenes about 40

percent faster than its closest competitor, although its non-AGP 2D and 3D scores were no better. List priced at \$189, the StarFighter AGP should be competitive with AGP boards from ATI and STB.

The StarFighter AGP's 3D quality is excellent, in part because—unlike most of its competitors—the Intel740 chip performs certain 3D calculations (including texture mapping) pixel by pixel.

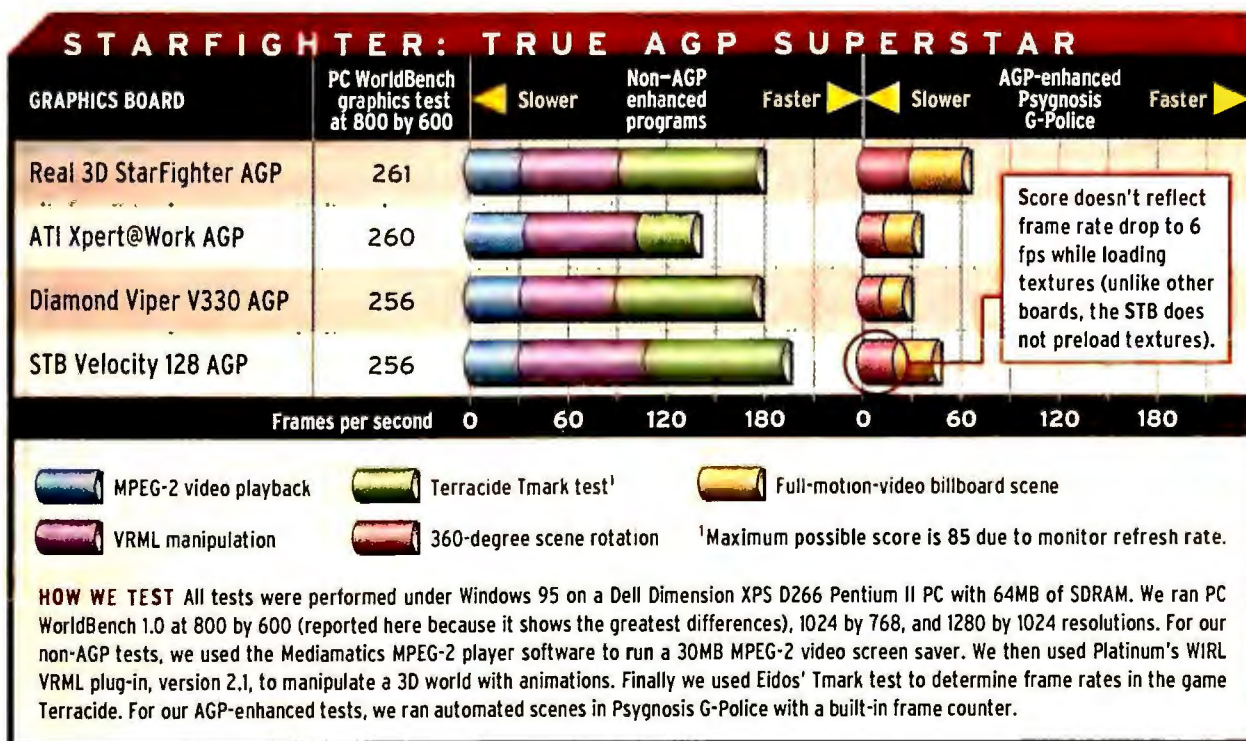
Because the Intel740 uses AGP2x—the highest level now available—it moves data very rapidly. It also does AGP texturing, meaning that it stores large, detailed textures in your PC's main memory. Unfortunately, very few programs currently take advantage of these features. (For more background on AGP, see “AGP Graphics: A Bumpy Ride,” December 1997.)

NEED A PENTIUM II?

BEAR IN MIND that because the Intel740 requires AGP, you need a Pentium II system of fairly recent vintage. However, Real 3D has developed an AGP-to-PCI bridge chip to enable a PCI version of the StarFighter chip, due a month or so after the AGP version. To raise the StarFighter PCI's performance to AGP's level, Real 3D is adding an extra 8MB of texture memory—but you'll pay: That card, with a 4MB frame buffer, should list for around \$229. So far, no other company has announced plans to offer an Intel740-based PCI card.

—Brad Grimes

• **StarFighter AGP (4MB), \$189**
list; Real 3D; 800/393-7730;
www.real3d.com



Modem Doublers Fall Far Short of Bold Claims



"SPEED ZONE! 112k," boasts the package for Boca Research's \$280 DynamicDuo. "Double your bandwidth" blares the box for Interex's \$50 Web OverDrive. If you're a speed-starved Web surfer—and who isn't?—these claims are enticing siren calls. Both products are among so-called modem-doublers that combine the bandwidth of two phone lines and promise an inexpensive and convenient boost in surfing performance.

Not so fast. In our tests, both packages failed to measure up to their vendors' speed claims. In fact, Web OverDrive bordered on the useless: It saved, on average, less than 2 seconds per page, giving it a mere 7 percent average improvement over a single modem. And though Boca's DynamicDuo came closer to achieving its claimed halving of the time

required for FTP downloads, it still fell far short of the mark in our Web browsing tests.

WEB OVERHYPE

INTEREX'S Web OverDrive is a Windows 95 software utility designed to tie together any two modems, regardless of make or speed. It attempts to speed up Web browsing, but not FTP downloads. Setup was tough; we initially couldn't get the browser to view Web sites, and the company's support rep couldn't provide a fix. Instead he told us to e-mail an event log that Web OverDrive generates, assuring us that an engineer would get back to us "in a few days." The problem turned out to be a conflict with our Anthem NE2000 Plus Ethernet network card, which we resolved by removing the card.

But performance was the bigger hurdle. Compared to a single 56-kilobits-per-second



modem, a combination of Web OverDrive and two 56-kbps modems saved only 8 seconds loading the CNN test page, and it actually took a bit longer to load the ESPN and Travelocity pages. Interex's director of engineering David Ginskey said the speedup claims were based on tests with 33.6-kbps modems. Our tests with 33.6-kbps modems showed a 13-

percent improvement over a single 33.6-kbps modem—a little better than the 56-kbps results, but nowhere near the claimed speed enhancement.

The low performance boost was likely due, in part, to how Web OverDrive employs the two modems. A Web page has elements varying in size from several kilobytes to several hundred. The utility uses a ►

56-kbps Standard Arrives—Are You Ready?

AFTER MONTHS OF haggling, modem vendors finally agreed on a 56-kilobits-per-second standard, named V.90. By the time you read this, the first V.90 modems based on chip designs from 3Com and Rockwell should be available. Modem shoppers should consider the following:

► **Should I get a V.90 modem?** If you already have a K56flex or x2 modem and have been calling into a compatible ISP, yet haven't been connecting above 33.6 kbps, then the answer is "no." Save your money until cable or DSL comes to

your area. Also, an x2 or K56flex modem may still be your best bet for the moment. They perform reliably because vendors have had months to work the kinks out of the code, plus some of them come with free unconditional upgrades to V.90, and stores will price them to sell to make way for their V.90 replacements.

► **When should I get a V.90 modem?** Wait until your ISP up-

grades to V.90, which probably won't happen before this summer. It usually makes no sense to buy the modem before your ISP supports it. It's also better to wait because, like wine, modems that use a new standard get better with age.

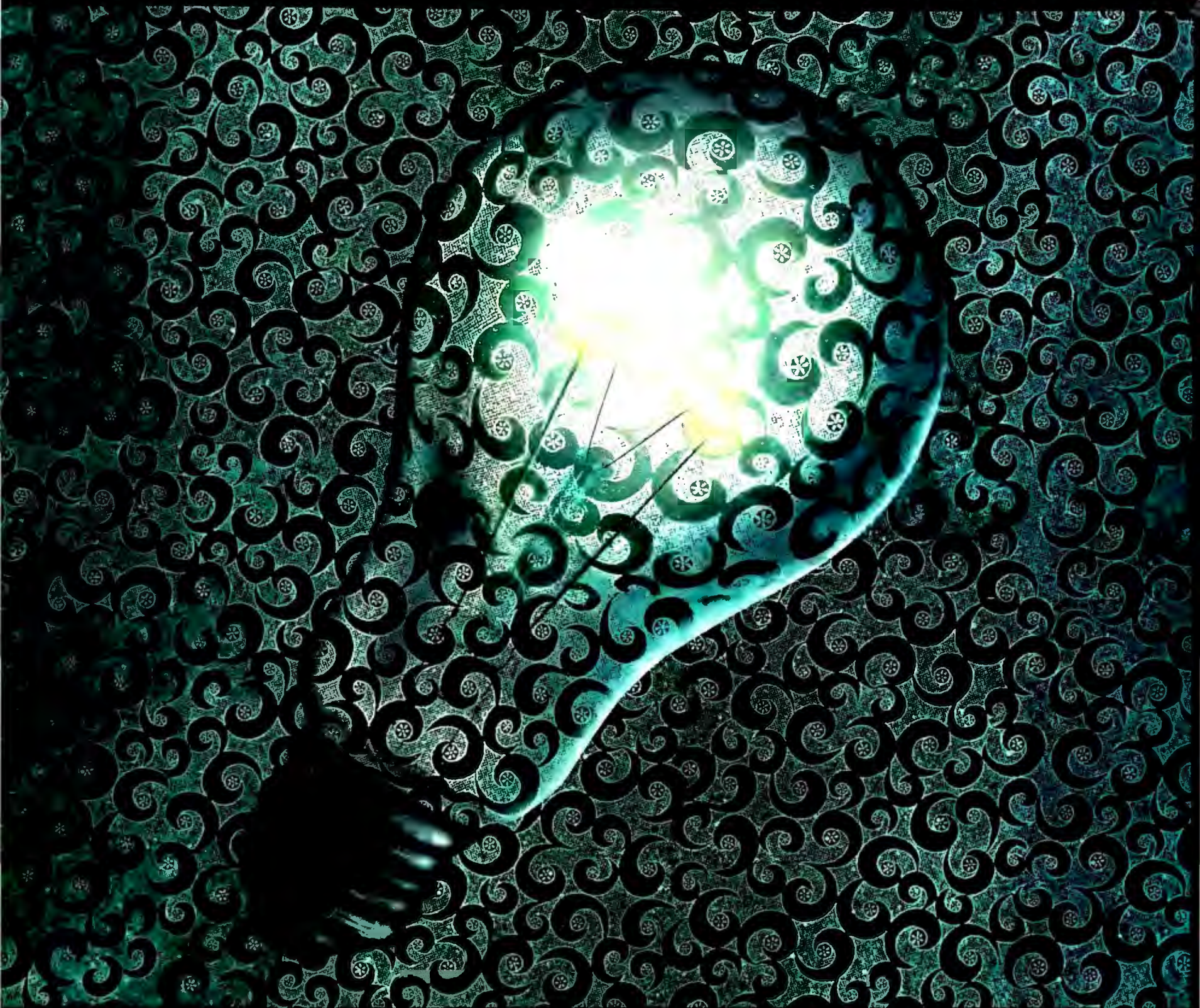
► **Which V.90 modem should I get?** Check our monthly *Top 10 Modems*—we'll be including V.90 modems in it as soon as they're available. But when a modem has a new proto-

col, try to match up the make of processor in your modem to the one in your ISP's server modems. Different modem chip makers often implement new protocols slightly differently, even if the protocol is a standard. So by sticking to a modem that has the same make of processor that your ISP's modems use, you'll minimize compatibility snags. For example, if your ISP uses Ascend modems, get a Rockwell-based modem, because Ascend modems use Rockwell chips. Likewise, if your provider uses Livingston modem racks, opt for a Lucent-based modem.



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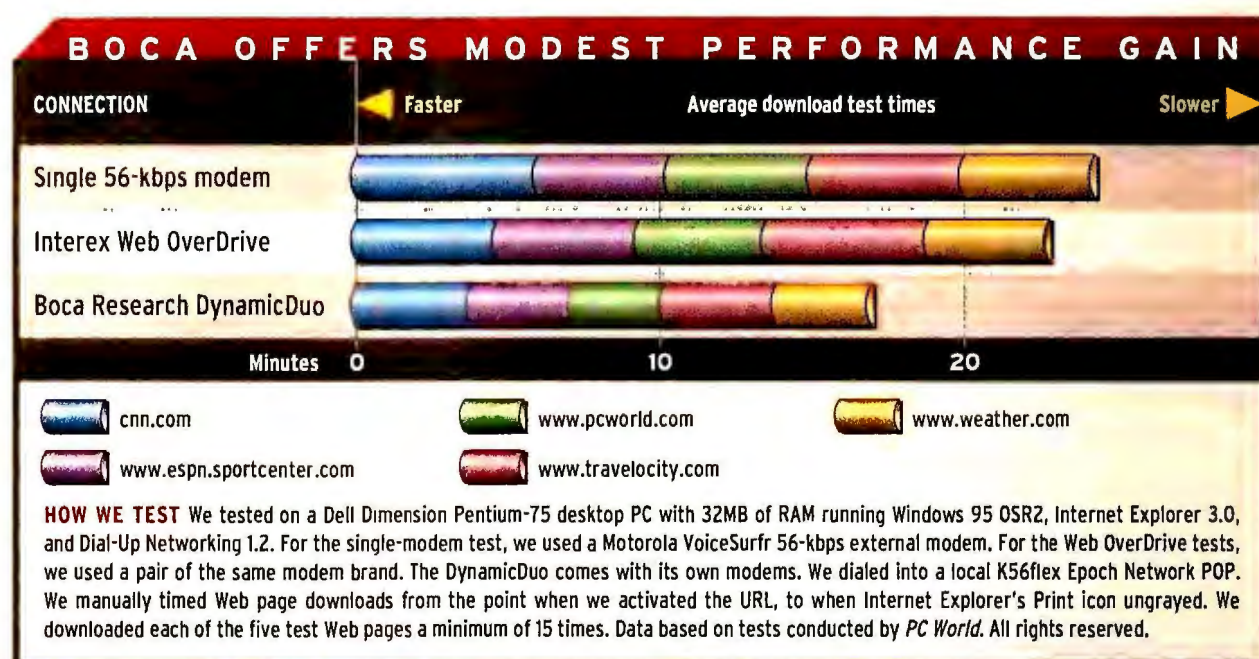
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technique called "load balancing" to divvy up page elements between the modems. The problem is that page elements often can't be evenly meted out. If a 300-kilobit Web page has a 200-kilobit element, one modem has to process this large element all by itself.

SOMEWHAT BETTER WITH BOCA

BOCA's \$280 DynamicDuo packs two 56-kbps modems into one 16-bit internal ISA adapter and includes Midpoint Companion software to manage the modem doubling. In addition to using load balancing, the DynamicDuo splits most Web page files in two, to spread the modem load more evenly. On average, the product loaded Web pages 42 per-



cent faster than a single 56-kbps modem did. The DynamicDuo also sped up FTP transfers, especially for larger files. It downloaded a 500KB ZIP file an average of 57 percent faster and a 2MB ZIP file 84 percent faster than

a single 56-kbps modem did. However, DynamicDuo does not improve the performance of streaming multimedia files, such as RealAudio sound.

As with Web OverDrive, we had to spend time getting the Boca product running. The

adapter is Plug and Play, but one of its modems was assigned the wrong IRQ, and the manual didn't tell us how to fix it. After we manually set the correct IRQ in Windows' Control Panel, both modems worked fine.

1500-kbps Modems for Christmas? Not for Most of Us

THIS YEAR, ACCORDING to rosy predictions from heavy hitters in both the PC and the telecommunications industries, you'll be able

to buy a Plug and Play Digital Subscriber Line modem for less than \$200 at a local retailer, pop it into your PC, and jump into cyberspace at warp

speed. Web pages that moved in slow motion will snap on screen in the blink of an eye; 20MB files that took an evening to download will arrive in minutes. You won't even need to get a second phone line. DSL lets you use the same line at the same time you're using it to make a phone call. (ISDN also lets you use the same line for voice and data, but each has to share bandwidth with the other.)



Heady stuff, but don't hold your breath. Citing impediments ranging from standards battles to expensive infrastructure up-

grades, some industry analysts see a delayed roll-out. "Widespread DSL service for the home is at least five years off," according to analyst John Navas of the Navas Group. "The recently formed mega-consortium of Microsoft, Intel, Compaq, and a half-dozen major phone companies is a promising first step, but we'll be lucky this year just to see real progress toward a standard." Even some industry proponents concede that the target date for the consortium's 1.5-megabits-per-second DSL standard—dubbed G.Lite—is wildly optimistic. Marc

Zionts, CEO of the DSL system manufacturer Westell, predicts that standardized, affordable DSL won't be available everywhere until the year 2000.

HERE SOON—TO A LUCKY FEW

SOME GOOD news: People in several regions of the U.S. won't have to wait that long. At least two providers are poised to deploy their own lower-speed, lower-priced versions of DSL. In June, US West will start deploying a flavor of DSL called MegaBit. By then, the company says, more than 5 million US West customers will have a choice of DSL services, ranging from \$40 per month for 256-kbps access, to \$120 per month for 1-mbps access. The Net-Speed MegaBit modems will cost \$199. Meanwhile, Transwire Communications will provide 1-mbps

Internet access to New York City customers this summer. Costs, including the modem, will range from \$90 to \$345 per month.

The bad news: Early adopters could be left out in the cold when the final standard is set. If you move to another region, your expensive DSL adapter could become worthless. Even if G.Lite prevails, it won't be for everyone. Certain household devices such as cheaply made phones and some light dimmers spew out electrical "noise" that can cause the DSL device to work slowly or not at all. And as with all flavors of DSL, the further you are from your phone company's local central office, the slower and less reliable G.Lite may be—and opting to buy a cable modem or even ISDN would make more sense. Rural customers who need high-speed Internet access should consider satellite service.

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NEW TECHNOLOGIES, MORE CAVEATS

DIAMOND MULTIMEDIA'S Shotgun software—which the company will be bundling free with 56-kbps modems by the time you read this—and Ramp Network's \$49 WebRamp PC—which should also be available by the time this issue reaches you—both promise to deliver substantially improved modem doubling through a technology called Multilink PPP. ML-PPP electronically melds two or more phone lines together to form one fat data pipe; having accomplished this, the technology can spread all files—text, graphics, and even streaming media—evenly

across the modems. But ML-PPP has a huge drawback: Few ISPs currently support it.

We didn't receive Shotgun or WebRamp PC in time to test either product, but we got a feel for how the underlying

faster. Diamond claims that Shotgun provides 70 to 110 percent faster surfing due to a special driver. Moreover, Shotgun will offer conveniences, such as the ability to automatically drop one line to accept

an incoming voice call or fax. Ramp Network says WebRamp PC won't be faster than Windows ML-PPP, but it will give users a choice: It will first try to connect using

ML-PPP, and then fall back to load balancing if necessary.

Should you buy a modem doubler? You may want to pass on Web OverDrive. Consider the DynamicDuo if you do a lot of surfing and FTP downloading and don't mind

forking over \$280. (A single 56-kbps modem costs about \$150.) If your ISP offers analog ML-PPP connections at no extra charge, you may want to consider purchasing a second modem to try this technology. ML-PPP is bundled in Windows 95 OSR2 and is available free from the Microsoft Web site to all other Windows 95 users. Diamond plans to bundle Shotgun at no charge with its new modems. If it's free, that's a price we can live with.

—Bryan Hastings

¥DynamicDuo \$280 street; Boca Research; 561/997-5226;

www.bocaresearch.com

READER SERVICE NO. 740

¥Web OverDrive \$50 street;

Interex; 800/513-9744;

www.xlr8.com

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Should you buy a modem doubler?

Think twice. But some will be offered free that's a price we can live with.

technology works by connecting to a test site using two 56-kbps modems and Windows' own ML-PPP software. The FTP transfers were completed almost twice as fast as with a single modem, and Web page downloads were 40 percent

LAN Wiring Worries? Use Phone, AC Lines to Untangle



IT SEEMED logical at the time: You have several PCs at home—why not connect them? You could exchange files and share a laser printer or Internet link with family or employees in your home-based business. But reality put a crimp in your plans. Running network cables between PCs and peripherals posed a problem. A visit to Home Depot convinced you that threading wire through the walls wasn't for you. And letting ugly cables snake over the shag carpet banned you for life from the pages of *Architectural Digest*. But now there's hope. Two companies are offering products that let you set up a network using the AC or phone

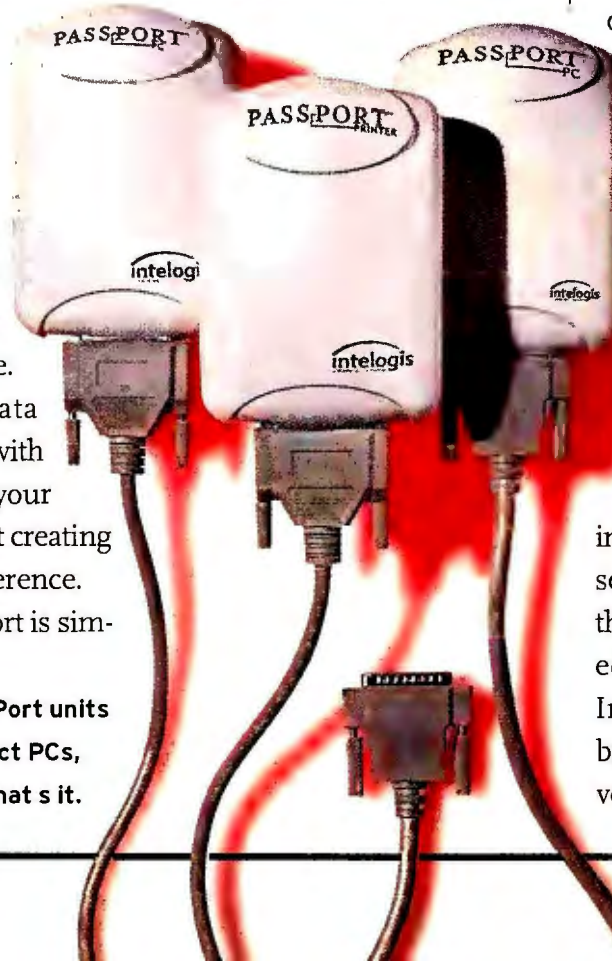
wiring already in your walls. They don't provide the performance of full-fledged networks, but they do offer a welcome solution to knotty wiring problems.

We tested a pre-production version of Intelogis's PassPort. The other new item, Tut Systems' HomeRun, was not available at press time. Both let network data packets "ride along" with the other signals on your existing wires without creating any detectable interference.

Hooking up PassPort is sim-

ple. It consists of adapters that go into any AC outlet. You just connect a PC or peripheral to the adapter with a cable.

EASY LAN: Plug PassPort units into AC outlets, connect PCs, install software and that's it.



PASSPORT PRICING

AN ADAPTER kit for connecting a PC costs \$99, and a kit for a printer costs \$49. To connect a PC, you plug one end of the included cable into your PC's parallel port and the other end into the the PassPort unit you've plugged into the wall outlet. You can't, however, run

parallel port peripherals at the same time you operate PassPort. The process is similar for adding a printer: You plug one end of a standard printer cable (not included) into the printer and the other end into the PassPort printer unit in the wall. You then install the PassPort networking software. Although setting up the early beta software we tested required multiple steps, Intelogis says the process will be automatic in the shipping version of PassPort. ►

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Networks With No New Wires

PRODUCT	Wiring used	Speed	Price	Comments
Intelogis PassPort 888/756-5199 www.intelogis.com	existing AC power	350 kbps	\$99.95 per PC; \$49.95 per printer	Easy setup, slow speed.
Tut Systems HomeRun 800/998-4888 www.tutsys.com	existing telephone line	1.3 mbps	\$100-\$150 per device (vendor estimate)	Requires installing add-in cards; moderate speed.
10BaseT Ethernet	unshielded twisted-pair network cable	10 mbps	About \$30 per PC plus \$100-\$300 for a hub for networks with more than two PCs.	Moderately difficult setup; full network speed and capabilities.

PassPort uses Windows 95's built-in networking. We were easily able to access the other PC and the printer on our network. Unfortunately, PassPort sends data through the AC lines at a poky 350 kilobits per second. Still, it's adequate for transferring all but the largest files. It took about a minute to transfer a 2MB file between

PCs. In contrast, a page that prints in about 10 seconds with a direct printer connection took several minutes with PassPort—too slow for big documents, but fine for small jobs like a typical newsletter.

MORE SPEED AHEAD

TUT SYSTEMS' HomeRun, which should be shipping

when you read this, promises much better performance using your existing telephone wiring, with speeds of about 1.3 mbps—about four times as fast as PassPort. You hook up your PC using a HomeRun Plug and Play add-in card, and run a standard telephone wire from the back of the HomeRun card to a phone jack. A

company spokesperson said the product will probably sell for between \$100 and \$150.

HomeRun lets you use all your telephones and a modem while the network is running, and it's fast enough to allow easier file transfers and higher-speed printing of large documents, the company claims. It won't be quite as easy to set up as PassPort, but HomeRun's potential speed would be a distinct advantage.

If you work from home, PassPort and HomeRun will provide a usable alternative to the sneakernet. But if you work with extensive graphics or large files, or you expect your business and network to expand, consider a standard LAN with regular cabling.

—Stan Miastkowski

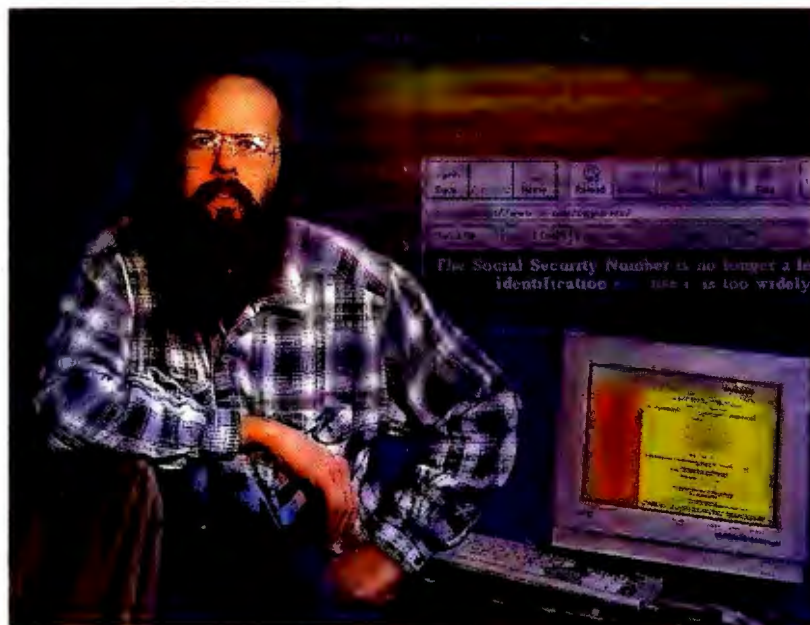
Flawed Privacy Agreement Lets It All Hang Out

CONSUMER ALERT

HAS THE SURGE of personal data on the Internet made you feel rather paranoid? Not to worry, say the big guns of the online information industry: We'll protect your privacy. According to them, an agreement signed by the nation's largest purveyors of personal information will allow you to shield yourself from snoops and crooks who want to collect sensitive information about you. But the pact seems riddled with loopholes that may keep it from becoming an effective shield.

PROMISES, PROMISES

THE AGREEMENT was signed in December by 14 members of the Individual Reference Services Group, which ac-



FEEL SAFE? DON'T. Privacy advocate Glen L. Roberts says a highly touted agreement by the database industry is badly flawed.

counts for 90 percent of the commercial traffic in personal information. The trade group includes database giant Lexis-Nexis and credit reporting agencies Equifax, Experian,

and Trans Union. They agreed not to distribute to the general public sensitive, nonpublic information—such as social security number, date of birth, and mother's maiden name—

that often serves as a key to finding financial data.

IRSG members agreed to:

- Stop selling the general public information on children, credit history, and medical records if drawn from a nonpublic source.

- Stop providing unlisted phone numbers and addresses unless they were obtained from a public source.

- Make it impossible for the public to run online searches using a social security number as a search term.

- Let consumers "opt out"—that is, remove information about themselves from databases if the information comes from nonpublic sources.

But the catch in each provision is the distinction between public and nonpublic sources. Companies may no longer hand out your social security or unlisted phone number to anyone who calls, if they ►

"The fire fighters saved my family,

The Jaz Disk

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STEPHEN TRIMM
Small Business Owner

When fire alarms woke the Trimms, Stephen's first concern was his family's safety. Next came the safety of his company, Innova Associates, based in the very home which was burning to the ground. However with his Jaz® drive and its sustained transfer rate of up to 6.62MB per second, days earlier, he had backed up his whole company (as much as 1 whole gigabyte in as little as 10 minutes) on a single Jaz disk. Despite the fact that his home was destroyed and his computer melted, his files remained safe on his amazing Jaz disk. Stephen's Jaz drive not only gives him the flexibility to run applications and files straight from disk, it's also compatible with nearly all operating systems. While rebuilding their lives remains a major task, Stephen rebuilt his business with the click of a button.

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obtained it via a private credit report. But the same information, if gathered from a public record such as a bankruptcy filing, is unaffected by the agreement. What's more, the look-up companies retain the right to sell sensitive information to licensed businesses.

That bothers privacy advocate Glen L. Roberts: "This agreement allows everyone to say we solved the problem," says Roberts, founder of the watchdog Stalker's Homepage (www.fulldisclosure.org). "But the information will still be bought and sold, and those who obtain the information [by misrepresenting their motives] are still going to do so."

AVOIDING REGULATION

THE AGREEMENT was aimed at staving off more restrictive government regulations and followed a report on the information industry by the Federal Trade Commission.

The FTC concluded that consumers do indeed have reason to fear for their privacy. Moreover, the FTC said, most of us are in a poor position to exert marketplace pressure against any of the information giants, since we tend not to be their customers. Nevertheless, the agency decided that the industry should regulate itself.

Though some privacy advocates have characterized the agreement as a good first step, my test drive of the services shortly after the policy went into effect left me with the uneasy feeling that consumers remain painfully vulnerable.

With an outlay of just \$7 and the help of a Web-based product from one of the agreement's signatories—Information America's KnowX service (www.knowx.com)—I man-

aged to locate my own unlisted home phone number and address in a matter of minutes.

I then tried to exercise the opt-out provision of the agreement. Forget it.

IT'S YOUR FAULT

INFORMATION America says the data it sold me comes from public sources and will remain online. "The things you've done [like buy a house]

out process every year or so.

Contacting the other IRSG companies that signed the agreement, I quickly learned that the opt-out provision isn't very meaningful. Of the 14, only Lexis-Nexis sells information from "nonpublic" sources to subscribers from the general public and is therefore obliged to take it off line. The others say the provision does not apply because they either

deal," he said. Plesser noted that opting-out was a small piece of a comprehensive solution and said the agreement requires providers to ensure that unauthorized people not buy access to the databases. Safeguards include requiring companies to verify information about subscribers, make customers agree to limit themselves to appropriate uses, and maintain accurate records.

Feeling Paranoid? Protection Starts Here



THE NATION'S 14 largest look-up companies have agreed to let consumers opt out of their databases. But loopholes in the agreement mean that most of the companies haven't altered their practices to safeguard your privacy. Here's how to reach the few that have.

► **Lexis-Nexis**, www.lexis-nexis.com, 800/227-9597—Has two products that make nonpublic information available to the general public. You can opt out online, or by fax or regular mail.

► **Information America, Inc.**, www.infoam.com, 800/235-4008—The company offers some databases to the general public, but these do not contain nonpublic information. However, if you contact the company, it will make a record of your request in case it later adds applicable databases.

► **Major credit reporting companies** like Equifax Information Credit Services and Trans Union Corporation won't let you opt out (they say they have no relevant products), but you can instruct them to stop giving your name to direct marketers. The best way is to contact Mail Preference Service, Direct Marketing Association, P.O. Box 9008, Farmingdale, NY 11735, and Telephone Preference Service, Direct Marketing Association, P.O. Box 9014, Farmingdale, NY 11735.

have put your information in the public record," Information America's general counsel Peggy Eisenhower told me.

I had a little more luck with Lexis-Nexis, which posts an online form visitors can use to remove themselves from the public database. But there's no guarantee the information won't work its way back in when the company acquires new data. In fact, a representative of the firm told me I'd do well to repeat the opting-

restrict access to their services to licensed businesses and government agencies or draw their information exclusively from public sources.

And remember, "nonpublic" information refers to the source—not the content—of the data, and many firms routinely scan public records in courthouses and government offices around the country.

Ronald Plesser, the trade group's attorney, defended the agreement. "We did a great

YET ANOTHER CATCH

THAT SOUNDS encouraging, but consider this: I am incorporated and I have a business license. I had no problem getting service from a company that provides access to data originally gathered by companies that signed the agreement. To qualify for access, I furnished a copy of my business license and basic billing information, and promised not to use the information to stalk someone or commit fraud.

With another small outlay of cash up front, I quickly found my editor's social security number. I didn't lie about who I was or why I wanted the information. But I could have, with just one click of a mouse.

There is no simple solution to the problem. The right to privacy has to be balanced against the need to access information. These databases can be misused to defraud or harass people, but they can also be used to prevent fraud, find criminals, make credit available, and locate people for a host of legitimate reasons.

Nonetheless, consumers need more protection. The agreement may be a first step, but until some of its loopholes are plugged, you have good reason to be paranoid.

—Daniel S. Levine ►

"How I fit 1 speeding downtown bus,
a crippled lunar lander, and
5 car-tossing tornados into a
4 INCH SQUARE."



STEPHEN HUNTER FLICK
Sound Designer

As the two-time Academy Award-winning sound effects specialist whose work includes films like *Speed*, *Apollo 13*, and *Twister*, Stephen Hunter Flick works with major movie studios creating some of film's most incredible effects. From compiling over 2,000 sound files to create a massive tornado to transporting or even cutting straight to digital picture, Stephen's work takes big space. With his Jaz drive and its sustained transfer rate of up to 6.62MB per second, he can back up 1 whole gigabyte in as little as 10 minutes. The Jaz drive not only gives him the flexibility to run applications and files straight from disk, it's also compatible with nearly all operating systems. So while Stephen's work is truly larger than life, it still fits neatly into his pocket.

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Reach Out and Browse Something



LATELY IT seems that everybody has a new gadget to get you onto the Internet without a computer. We looked at the latest generation of telephones with screens. They combine the largest LCD touch screens on such devices to date; the ability to transact e-mail; and graphical Web browsers.

At first glance, these screen phones look pretty cool—especially for places like your bedroom, or a small second office where you need a phone and would like limited Web access but simply don't have room for a full-blown PC. Unfortunately, at \$500-plus they're pricey, and their Internet functions are limited.

DOLLARS FOR DIALERS

THE \$499 CIDCO IPhone and the \$650 Philips Consumer Communications IS-2630 are designed for home and home-office use, possibly by people who have Internet access on a computer elsewhere. Neither phone can handle corporate-type voice mail, although both will alert you if you get new messages via a third-party answering service, such as those offered by many phone companies. Both products provide the usual complement of advanced phone features such as a personal auto-dial directory, a speakerphone, and speed-dial presets.

The IPhone unit is the more compact of the two. Its black-and-white, 7.4-inch-diagonal screen lies flat on the unit, above the

dialpad; a minuscule keyboard slides out from the base of the telephone. Browsing with the built-in 14.4-kbps modem on a preproduction unit went slightly faster than you might expect, because software on a supporting Internet service provider's computer eliminates color and fancy formatting before relaying them to the IPhone. But this means you must use an Internet service provider that supports the phone, and for now only Concentric Networks offers this service. The IPhone does let you check e-mail from another POP3 e-mail account by changing a setting, however. We found the unit's display adequate, though the tiny keyboard was barely usable.

THE COLOR OPTION

THE PHILIPS IS-2630 sports a color screen, slightly larger than the IPhone's. A PC Card slot and serial port are available for handling future acces-

sories; for example, a PC Card due this summer will add answering-machine functions.

At launch, the IS-2630 will require users to connect with one of several ISPs, including AT&T WorldNet; if you want to check mail from another ISP, you'll have to forward it. Philips says it plans to upgrade the phone soon after launch to support most ISPs. We found connecting and browsing with a preproduction unit's 28.8-kbps software modem to be rather slow, but Philips said the shipping version would work much better. We liked the keyboard, despite the large amount of tabletop space it demands.

DOWN THE LINE

ARE THESE phones feasible alternatives to PCs for Internet access? Only for very limited e-mail transactions and quick

DIAL 'N' BROWSE: Philips' IS-2630 displays simple Web pages in handsome color, but costs almost as much as a budget PC.

information hits like stock quotes, phone numbers, and news headlines. These units can't receive e-mail attachments or handle Web sites with Java. And their \$500-plus price tags put a big damper on our gadget lust.

Our advice: If you need a PC, buy a PC. If space is limited, consider springing for a notebook. If you only need Net access, go with a set-top box such as the \$199 WebTV Plus (see @Home in this issue).

—Yardena Arar

• CIDCO IPhone \$499; 800/929-8246; www.cidco.com

READER SERVICE NO. 742

• Philips Consumer Communications IS-2630 \$650; 800/783-9248; www.philipsconsumer.com

READER SERVICE NO. 743 ►



Net Appliance Trade-Offs

SET-TOP BOXES

- Moderately priced (\$199-\$250)
- Large, color display
- Low resolution means blurry text
- Wireless keyboards easy to use
- Limited ISP choice

SCREEN PHONES

- Expensive (\$500-\$650)
- Small footprint, lightweight
- Auto-dial phone books and other phone features
- Limited ISP choice



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G6-333XL pictured with G-Series tower case.

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- 13X min/32X max CD-ROM Drive
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- Ensoniq Wavetable Audio
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- TelePath Modem for Windows with x2 Technology
- G-Series Mid-Tower Case
- MultiFunction Keyboard & MS IntelliMouse
- MS Windows 95
- Microsoft Home Essentials Software
- Gateway Gold Service & Support for G-Series PCs

\$1999 As low as* \$70/mo.

G6-300

- Intel 300MHz Pentium II Processor with 512K Cache
- 64MB SDRAM
- EV700 .28 Screen Pitch 17" Monitor (15.9" viewable)
- 4MB 3-D AGP Graphics
- 8.4GB 8.5ms Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive
- 3.5" Diskette Drive
- Ensoniq Wavetable Audio
- Boston Acoustics MicroMedia 3-Piece Speaker System
- TelePath Modem for Windows with x2 Technology
- G-Series Mid-Tower Case
- MultiFunction Keyboard & MS IntelliMouse
- MS Windows 95
- Microsoft Choice Software
- Gateway Gold Service & Support for G-Series PCs

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G6-333

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- 4MB 3-D AGP Graphics
- 8.4GB 8.5ms Ultra ATA Hard Drive
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- Boston Acoustics MicroMedia 3-Piece Speaker System
- TelePath Modem for Windows with x2 Technology
- G-Series Mid-Tower Case
- MultiFunction Keyboard & MS IntelliMouse
- MS Windows 95
- Microsoft Choice Software
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- PC Computing 1997 MVP Award
- PC Magazine Editors' Choice Award, May 1997

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Data Grade CRT: 33" Diagonal (31.5" viewable) • Invar Shadow Mask • Resolution: 640 x 480 @ 60-72Hz, 800 x 600 @ 60Hz • Unlimited Display Colors • Scanning Frequency: Horizontal, 31 to 38kHz; Vertical, 50Hz to 72Hz

36-inch SVGA Monitor*

Data Grade CRT: 38" Diagonal (35.5" viewable) • Invar Shadow Mask • Resolution: 800 x 600 @ 60Hz • Unlimited Display Colors • Scanning Frequency: Horizontal, 31 to 37kHz; Vertical, 59Hz to 75Hz • Autoswitching PC/TV Mode Digital TV Capabilities Digital Line Doubling, Progressive Scan • Digital Comb Filter • Two-tap Vertical Line Interpolation • Five-tap Horizontal Line Interpolation • Brooktree 2164 Graphics Chip • 829a Video Decoder • 181-Channel, Cable-Ready TV/Tuner

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\$1999 As low as* \$70/mo.
PC World Best Buy, January 1998

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*According to a BatteryMark 2.0 battery life benchmark test conducted September, 1997 by Key Labs, Inc. Battery life may vary depending on use. A free copy of the test is available at www.keylabs.com.

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- Carrying Case
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9100XL BEST BUY

- ▶ 14.1" XGA TFT Color Display
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- 64MB SDRAM (expandable to 192MB)
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- ▶ Removable Combo 8X min/20X max CD-ROM & 3.5" Diskette Drive
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- Two Lithium Ion Batteries & AC Pack
- USB Ports, CardBus & Zoomed Video Support
- NTSC/PAL Video Input & Output
- 16-Bit Wavetable Sound & Altec Lansing® Speakers
- PC Card Modem w/ x2 Technology & cellular support
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- LapLink for Windows 95 & McAfee VirusScan
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Solo 9100, PC Magazine Editors' Choice Award, January 1998



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They've got car payments on the 5th, school loans on the 15th and a Gateway PC in the back seat.

Everyone knows GATEWAY PCs top the industry thanks to fresh technology and Intel Pentium® III processors. Now hassle-free financing options make it even easier to ride off into the sunset with one of your very own! No wonder thousands of satisfied customers fall in love with Gateway every day.





All Gateway PCs are custom built to fit your needs with powerful Intel Pentium II processors. (System pictured with G-Series desktop case.)

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- Epson Stylus COLOR 800 Ink Jet Printer **\$349**
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- Comfy™ ComfyKeyboard (for kids) **\$99**
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- APC Back-UPS Pro 650 **\$319**

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NEW PRODUCTS

Quantex Pentium II PCs Show Less Is Sometimes More

DESKTOP

YOU DON'T CRAVE a simply serviceable PC right now. No, you picture yourself starring with Sandra Bullock in *Speed III: The Supercomputer*. And why shouldn't you want the fastest system you can get? After all, Intel introduced a slew of fast processors recently, then lowered prices, putting a system with the fastest chip within your budget. But be careful—this is a tricky time for shoppers. Quantex's new Pentium II-333 PCs for small businesses and homes are cases in point.

The basic, home-oriented **QP6/333 M-4x** and small-business-minded **QP6/333 SM-4x SE** cost a bit less than other comparably configured Pen-

tium II-333s we've seen. They are dressed up with generous software bundles, including Corel or Microsoft suites.

However, you can save \$150 if you buy the Pentium II-300 versions of the same systems, and you won't notice any difference with business applications. Though \$150 may not seem like much, consider this: \$99 buys you a color scanner for your home or small office.

THE HOME SCENE

WE TESTED A shipping version of the Quantex QP6/333 M-4x, street-priced at \$2499, a workhorse for the home or small office. It doesn't have many frills, but it's far from skimpy, with 64MB of RAM, a

6.4GB hard disk, a Toshiba 16X-32X CD-ROM drive, a K56flex modem, and a good-looking 19-inch monitor.

The system uses a FireGL 1000Pro AGP graphics card with 8MB of SGRAM and an Ensoniq Audio PCI sound card. The Altec Lansing ACS 45 speakers with subwoofer sound good. A home-oriented software bundle includes Corel WordPerfect Suite 8.

How about speed? In PC WorldBench tests, the Quantex QP6/333 M-4x earned a score of 271. Of the four other Pentium II-333 systems we've tested, the fastest garnered a 281 and the slowest a 276. In contrast, the 25 Pentium II-300s with 64MB of RAM we've tested posted an average

score of 270—almost identical to this Quantex PII-333's score. And the difference between 281 and 271 is negligible. You're smarter to choose the Quantex QP6/300 M-4x, with the same configuration for \$150 less (\$2349).

SMALL-BUSINESS SET

THE \$2799 QP6/333 SM-4x SE has just a bit more sizzle. Like its sibling, it sports a K56flex modem, 64MB of RAM, and a 19-inch monitor, but this system adds an 8.4GB hard drive.

An STB Velocity 128 AGP card (with 4MB of SGRAM instead of 8MB, which would be preferable) handles graphics, and the Toshiba second-generation DVD-ROM drive plays movies without a problem. This system also has Ensoniq's Audio PCI sound card, but with a better speaker and subwoofer set, the Altec Lansing ACS 490. Microsoft Office 97 Small Business Edition heads the software bundle.

PHOTOGRAPH: MARC SIMON



SPEED BUMPS: Quantex's QP6/333 M-4x and QP6/333 SM-4x SE Pentium II-333s have much to offer, but Pentium II-300 versions are better deals.

Speedwise, a shipping unit racked up a PC WorldBench score of 276, just higher than the QP6/333 M-4x's, thanks to its faster IBM hard drive. Nonetheless, this difference

QP6/333 M-4x

PRO: Affordable workhorse, good software bundle for home use, and good-looking 19-inch monitor.

CON: Not much performance boost from the 333-MHz chip compared to Pentium II-300 machines.

VALUE: Save \$150 with no perceptible drop in performance by buying the Pentium II-300 model.

Street price: \$2499

READER SERVICE NO. 686

won't show in everyday use.

Overall, this system is hard to fault, but here too the Pentium II-300 version, the QP6/300 SM-4x SE, is a better deal at \$150 less (\$2649).

QP6/333 SM-4x SE

PRO: Nice software and multimedia extras for the small business.

CON: Again, not much performance bang for the buck.

VALUE: Choose the Pentium II-300 model for \$150 less.

Quantex

800/896-4898

www.quantex.com

Street price: \$2799

READER SERVICE NO. 687

One negative: The Quantex manuals are merely adequate.

READY FOR THE SHOW?

BEFORE BUYING a Pentium II-300, consider one other fact: Later this spring, PII-350 machines will incorporate a 100-MHz system bus instead of today's 66-MHz bus, so the chip will talk to other parts of the PC faster. Should you hold out for one? If you want the very fastest cruncher you can get, then yes, you'll have to make Ms. Bullock wait. Otherwise, grab a Pentium II-300 and enjoy the show.

—Laurianne McLaughlin

- 82 Quantex QP6/333 M-4x and QP6/333 SM-4x SE desktop PCs
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- 88 Microsoft Office 97 Small Business Edition 2.0; The Learning Company Calendar Creator 5.0
- 90 HP 620LX Palmtop PC, Casio Cassiopeia A-20, Sharp Mobilon HC-4100; NEC Beacon Data Pager
- 94 Intel InBusiness Internet Station, Voice It Digital Voice Recorder
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- 98 Iomega Jaz 2GB drive, Castlewood Systems Orb drive; Traveling Software Remote DeskLink
- 100 VideoLogic SonicStorm and Diamond Monster Sound M80 sound cards; GlobeWave Complete PC Card modem

I N T E R N E T
 FOR MORE PRODUCT news and the latest announcements, check out the PC World Daily News Service at www.pcworld.com/news.

The company also provides round-the-clock tech support. For complete reviews of Sony's competition, see "Big Screen Debuts" in this issue. And this summer, look for more 19-inch monitors using stripe pitch tubes to arrive.

—Mick Lockey ►

Sony Multiscan GDM-400PS

PRO: Terrific graphics quality, unusually good controls.

CON: Quality this good will cost you.

VALUE: If you work with graphics, it's worth the investment.

Sony Electronics

800/352-7669

www.sony.com/displays

Street price: \$1200

READER SERVICE NO. 688

A Picture Worth \$1200: Sony 19-Inch Monitor

MONITOR

IF YOU'RE A graphics professional or just someone who appreciates (and is willing to pay for) excellent graphics quality, feast your eyes on one of the better 19-inch monitors we've seen. Sony's new Multiscan GDM-400PS produces great results with photographs.

This is the first 19-inch Trinitron monitor that contains an aperture grille mask (also called a stripe mask) tube. This tube technology produces brighter, more colorful graphics compared to shadow mask tubes. At a street price of \$1200, the Sony costs \$300 more than most 19-inch monitors. But you get better-than-average graphics quality, along with user-friendly adjustment features and highly advanced image controls.

In PC World tests of a proto-



BRIGHT, COLORFUL GRAPHICS: Sony's Multiscan GDM-400PS stands out.

type unit, the GDM-400PS did a better job than most monitors at displaying text, and its graphics quality was outstanding—especially on photographs. Our test image of a bowl of fresh fruit showed intense color saturation, with lusciously red strawberries. In an image of Olympic runners, skin tones were unusually lifelike. We even found it easy to differentiate the subtle pin-

stripes of a suit in a black-and-white photograph.

A row of buttons at the bottom right of the front bezel permits easy access to on-screen adjustment menus. An unusual touch: You can adjust the horizontal and vertical settings simultaneously. Once you've fine-tuned the settings, you can lock

them into place to prevent changes by other people. Sony offers controls usually found only on the most high-end monitors, such as the ability to adjust convergence in different sections of the screen. These controls let you precisely correct electron gun misalignment that may occur as the monitor ages.

Sony's three-year warranty meets the industry standard.

EDITED BY

Yardena Arar and
Laurianne McLaughlin

When it comes to value, they should win an award.

(When it comes to performance,
they already have.)



[Shown with optional NEC C700 17" Monitor (16" viewable)]

NEC Direction™ Series
PC Magazine Editors' Choice Award Winner



NEC Versa® 2000 Series
Home Office Computing Editors' Pick



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- NEC C700™ 17" Monitor (16" viewable)
- Microsoft Home Essentials 98
- * Upgrade to 128MB SDRAM Memory, add \$179
- * Upgrade to NEC C900™ 19" Monitor (18" viewable), add \$249
- * Altec Lansing ACS-410 Surround Sound Speaker System with ACS-251 Subwoofer, add \$69
- * Iomega 100MB Internal Zip Drive with One Cartridge, add \$99

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Consumer Lease: \$99/mo. Code #D5085

Direction 300L

- 300MHz Pentium II processor
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- 6.4GB Ultra DMA Hard Drive
- 24X max Variable-Speed CD-ROM Drive
- Diamond Viper AGP, 4MB SGRAM Graphics Card
- Altec Lansing ACS-90 Speakers
- 32 Voice Wavetable Audio
- U.S. Robotics x2 Winmodem
- NEC C550™ 15" Monitor (14" viewable)
- Microsoft Home Essentials 98
- * Upgrade to 128MB SDRAM Memory, add \$179
- * Upgrade to 8.4GB Ultra DMA Hard Drive, add \$49
- * Upgrade to NEC C700 17" Monitor (16" viewable), add \$199
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\$1999

Consumer Lease: \$79/mo. Code #D5086

Direction 300L

- 300MHz Pentium II processor
- 32MB SDRAM Memory
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- 24X max Variable-Speed CD-ROM Drive
- Diamond Viper AGP, 4MB SGRAM Graphics Card
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- * Upgrade to 64MB SDRAM Memory, add \$79
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Consumer Lease: \$67/mo. Code #D5087

Direction 233L

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- 32MB SDRAM Memory
- 4.3GB Ultra DMA Hard Drive
- 24X max Variable-Speed CD-ROM Drive
- Number Nine Reality 334 AGP, 4MB SGRAM Graphics Card
- Altec Lansing ACS-90 Speakers
- U.S. Robotics x2 Winmodem
- NEC C550 15" Monitor (14" viewable)
- Microsoft Home Essentials 98
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- * Upgrade to 6.4GB Ultra DMA Hard Drive, add \$89
- * Upgrade to NEC C700 17" Monitor (16" viewable), add \$199
- * Altec Lansing ACS-45 PowerCube Speaker System with Subwoofer, add \$39

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A Better Microsoft Office for Small Business

PRODUCT MICROSOFT HAS added more than a fresh coat of templates to the new Small Business Edition of Office 97. Judging from my examination of a pre-release version, I'd say this is a must-have suite for a start-up company.

Not that **Office 97 Small Business Edition 2.0** is perfect. My biggest complaint: Each application must be installed individually. But after you do that, Publisher 98 alone will quickly win you over. Few desktop publishing programs are this easy to use. You also get the most recent versions of Word and Excel, with special add-in tools for small businesses.

OFF TO SEE THE WIZARD

PUBLISHER 98's wizards step you through creating everything from business cards to Web pages. What's more, they hang around, remaining accessible at the click of a button.

Publisher 98 handles text more wisely than its predecessor. Text automatically shrinks to fit the space provided.

Microsoft Office 97 Small Business Edition 2.0

PRO: Excellent desktop publishing, mass mailing, and finance tools.

CON: Must install each program individually.

VALUE: A must-have for any small company's first computer.

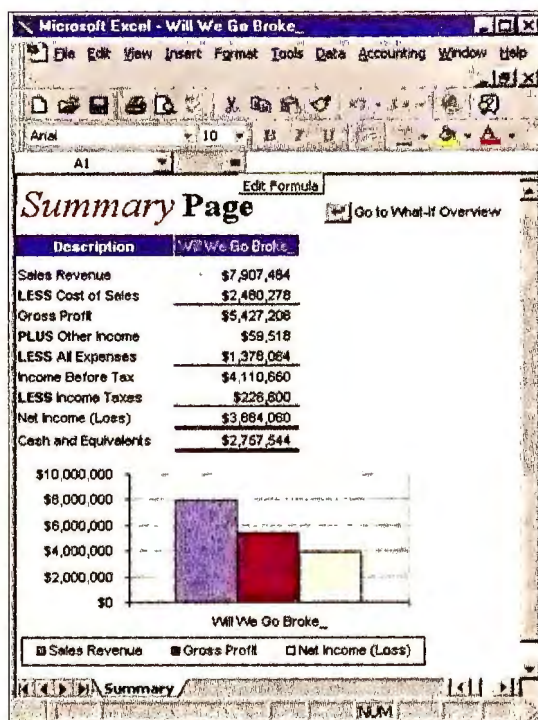
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WHAT IF: Financial Manager analyzes what your company needs to succeed.

Word's strong automatic spelling checker and auto-correct features save you time. And when you enter your name and address into, say, a business card, Publisher remembers them when you design your letterhead. (Publisher 98 will also sell separately; pricing wasn't set at press time.)

MAIL AND FINANCE TOOLS

DIRECT MAIL MANAGER, a new tool for overseeing mass mailings, helps you spread the word. Give it your address database (it reads several formats) and it extracts the relevant fields, then verifies ZIP codes and street addresses from a U.S. Postal Service database on the Internet. It also checks for duplicate addresses, though not very well, judging from the beta version.

Then you can print envelopes, send the list electronically to a mailing service, or use Word's merge tool.

One particularly valuable addition, the Small Business Financial Manager, works with Excel to analyze the financial health of your company. The Manager imports data from accounting programs. You can then project future earnings, compare your company with its competitors, and try what-if scenarios for loans and other options. These features are particularly impressive, letting you monkey with the numbers representing what you spend and make. If only it were that easy in real life.

Rounding out the suite are Internet Explorer 4.0, Outlook 98, and Expedia Streets 98, a mapping program. The last two have earned good marks from *PC World*. (You can read all about Outlook in February's *New Products* and about

Streets at www.pcworld.com/software/multimedia_titles/articles/dec97/1512p136.html.)

Best Calendars

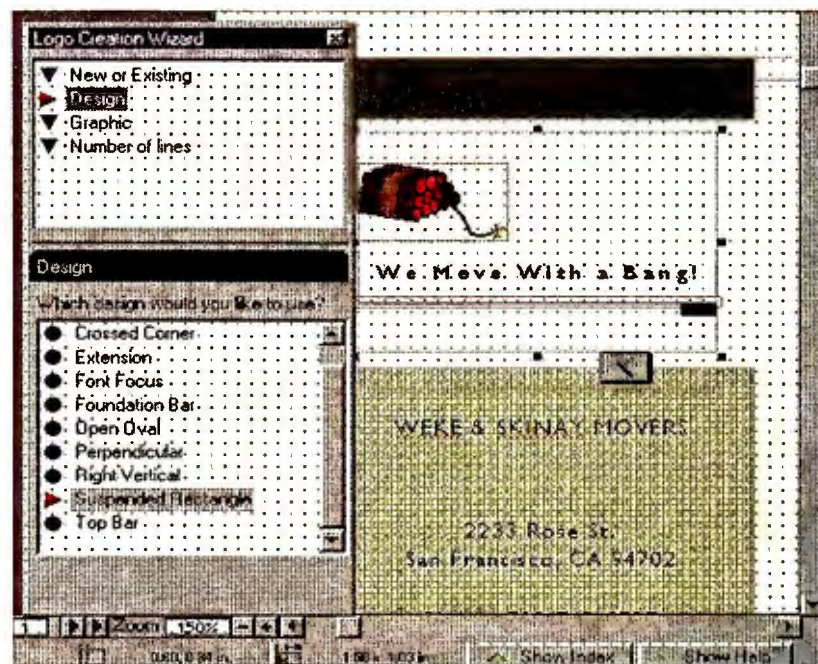
The best is back: **Calendar Creator 5.0** will please home and small businesses with its easy-to-print, customizable calendars and improved personal information management features. This \$60 program has always produced sharp-looking calendars, and version 5.0 has plenty of custom backgrounds, text effects, and clip art images (more than 5000). It also provides better scheduling and contact management features. For example, now you can look at multiple calendars and event lists at once, attach alarms to appointments, and link contact information from your address book to events in your schedule. While Calendar Creator 5.0 won't replace a \$300 contact manager, it's more than adequate for home use, making this program a better value. The Learning Company, 800/227-5609, www.learningco.com.

READER SERVICE NO. 690

—Angela Freeman

Streets at www.pcworld.com/software/multimedia_titles/articles/dec97/1512p136.html.)

—Lincoln Spector



GEE WHIZ: Wizards in Office 97 Small Business Edition 2.0 ably lead you through tasks such as logo design.

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HP Palmtop Screen Makes Others Look Green

THE HANDHELD PC

UNTIL NOW, you could divide palmtop computer screens into three classes: mediocre, dismal, and just plain terrible. No longer—Hewlett-Packard's

fare so well. The Cassiopeia is the least expensive option, and the most spartan. The Sharp merits attention mostly for its snap-on digital camera option.

The \$899 HP 620LX sports

The price you pay for the 620LX's splendid screen is limited battery life—about 4 hours in my tests, versus 10 or more for monochrome handhelds. And because the unit's juice comes from its proprietary battery pack, you can't just pop in fresh AA batteries; you must recharge the battery with the included AC adapter.

Too chunky to fit into a pants pocket, the 620LX is on the large side for a palmtop. Still, it's much easier to tote

than a notebook, and it may be all the portable PC you need for e-mail, note taking, and other basic tasks.

The 620LX faces competition from one other color Win-

dows CE 2.0 palmtop,

Sharp's \$999 Mobilon HC-4500. That product wasn't available in time for this review, but I did get my hands on a shipping Mobilon HC-4100, a similar \$699 model with 12MB of RAM and a built-in 33.6-kilobits-per-second modem but a typically dim monochrome screen. The most intriguing thing about either Mobilon is Sharp's optional \$399 digital camera PC Card. Plug it in, and the palmtop becomes a service-

A Pager to Pocket

NEC's \$249 **Beacon Data Pager** does more than receive short, clipped messages. It lets you add PC-based schedule and contact information, a personal notepad and to-do list, and reminder alarms. The pager receives data from your palmtop, notebook, or PC using infrared technology. Thus, you can trade Microsoft Outlook or Schedule data with your PC. (For connections to non-infrared-ready PCs there's a serial infrared reader. Puma Technologies' optional \$50 IntelliLink for Beacon works with other major PIMs.) Powered by two AAA batteries, the Beacon weighs just 3 ounces. Its eight lines of display allow 21 characters per line; four buttons handle all tasks. You can also password-protect information. Pager service costs and the price of the Beacon depend on your paging service provider. NEC America; 800/225-5664; www.nec.com.

READER SERVICE NO. 705

—Michael Lasky

able digital camera that can download good-quality color photos to your PC.

LOW-COST OPTION

THE CHEAPEST of these three Windows CE 2.0 units, Casio's \$599, 8MB Cassiopeia A-20, has no gee-whiz features like a color screen, camera option, or built-in modem. The shipping unit I tested also had the weakest keyboard of the three, a mushy design that led to lots of typos. But unlike Sharp, Casio throws in an AC adapter and a smorgasbord of 14 applications including PcAnywhere remote control, a note taker, and (most important for mental health breaks) Tetris.

—Harry McCracken ►



WASH THAT GREEN right out of my screen: HP's 620LX Palmtop combines a great color display and a nice keyboard.

new Windows CE 2.0 handheld, the **620LX Palmtop PC**, is the first to sport a notebook-style backlit color screen. Crisp and legible in any lighting environment, it represents a huge improvement over the sickly green monochrome displays of most handhelds.

Two other new arrivals, Casio's **Cassiopeia A-20** and Sharp's **Mobilon HC-4100**, don't

a better-than-average keyboard and a very generous 16MB of RAM. I tested a shipping version. The built-in Windows CE 2.0 applications—pocket versions of Word, Excel, Internet Explorer, and Outlook, plus a viewer for PowerPoint presentations—look great in color, though they're still pretty stripped-down compared to their desktop siblings.

Casio Cassiopeia A-20

PRO: Nice software bundle.

CON: Keyboard, screen disappoint.

VALUE: Least expensive, most spartan.

Casio

888/204-7765

www.casio.com

Street price: \$599

READER SERVICE NO. 702

620LX Palmtop PC

PRO: Best color screen.

CON: Short battery life, a bit bulky.

VALUE: Color and extra memory justify the price.

Hewlett-Packard

800/443-1254

www.hp.com

List price: \$899

READER SERVICE NO. 703

Sharp Mobilon HC-4100

PRO: Very cool camera option.

CON: Dim display, AC adapter costs extra.

VALUE: Camera-capable contender.

Sharp

800/237-4277

www.sharp.com

List price: \$699

READER SERVICE NO. 704

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that's within reach.



DeLorme puts GPS Navigation within your reach for as little as \$160—with DeLorme Tripmate™ and Street Atlas USA® 5.0 software. Connect to your laptop or download text route directions to your 3Com® PalmPilot™ (additional cable required from DeLorme). GPS voice navigation lets you hear spoken directions on your laptop as you drive. Available at your local retailer. Visit www.delorme.com to learn more or call 1-800-452-5931, use priority code CA020.



"DeLorme Street Atlas USA provides the best navigational tools. The leading products are closely matched in many areas, but DeLorme's robust support of satellite navigation and automatic route creation make this well-balanced program the best choice." —National Software Testing Labs

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SONY Specifications

PCV-230

- 300 MHz Intel® Pentium II® Processor
- Features MMX™ Technology
- 64 MB SDRAM (expandable to 384 MB)
- 6.4 GB IDE Hard Drive

PCV-210

- 266 MHz Intel Pentium II Processor
- Features MMX Technology
- 32 MB SDRAM (expandable to 384 MB)
- 4.3 GB IDE Hard Drive

Common features

- 3D Graphics Acceleration, 64-Bit AGP with 4 MB SG Video RAM (ATI 3D RagePro™)
- 3D 32-Bit PCI Sound System for dynamic hi-fidelity audio
- 33.6 DSVD/14.4 Fax Modem with K56flex™ Technology¹
- 24X CD-ROM Drive (maximum performance)²
- 512 KB Pipeline Burst SDRAM
- MPEG Digital Video with Full Screen Playback

- Over 30 pre-installed software titles, including Windows® 95, and leading productivity, entertainment, reference and communication titles
- 24-hour, 7-days-a-week Sony Interactive online support
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VAIO Tower PC
Model#: PCV-210

\$1,699.99

As low as \$30.49 a month
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Model#: PCV-230

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Multimedia display sold separately

¹K56flex™ technology products are capable of 56Kbps. Due to FCC rules that restrict power output, however, current download speeds are limited to 53Kbps (max). Upload speeds are limited to 33.6Kbps. Actual speeds may vary depending on line conditions. ²Data on a CD-ROM is read at a variable transfer rate, ranging from 10K at the innermost track to 24X at the outermost track (the data transfer standard 1X rate equals 150 kbytes/second and the average data transfer rate is 177X or 2250 kbytes/second).

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Model#: IJP-V100

Price: \$449.00



Trinitron 17" Multimedia Display (16" VIS)

A great combination of Sony's world-famous home audio sound and award-winning Trinitron® Display Technology. A sharp, clear multimedia display that sounds as good as it looks.

Model#: CPD-220VS

Price: \$829.99



PS Series 19" Trinitron Display (18" VIS)

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Model#: GDM-400PS

Price: \$1,199.99

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Gift Code: SN-PW-4/98

Gadget Lets Small Office Share an ISP Account

NETWORKING

IN A SMALL OFFICE or home office, equipping every PC with a modem and every user with an Internet account can be a budget buster and a time drain. But Intel's **InBusiness Internet Station** brings Plug and Play Internet access to small networks. Technically known as a router, the Internet Station lets you plug a modem and phone line into it and then plug it into your network via a hub or switch.

Then, every user on the network can access the Net using a single Internet service provider account. You'll probably want to get everyone a different e-mail address, which usually costs about an extra \$5 per person per month.



SIX TO 12 USERS, one ISP account: Intel's Internet Station.

At \$499, the Internet Station is a bit expensive and clearly not for casual home users. You can do much the same thing for about \$20 using proxy server software (see

March's *New Products* for a review of a good choice from StarTech). But setting up proxy servers is complex, and they can hog PC resources. The Internet Station is self-contained, easy to set up, and powerful enough to give occasional Net access to 6 to 12 users. It also supports ISDN.

The Internet Station's installation software automatically sets up the required TCP/IP network connections for all your PCs. You then use a standard browser (Internet Explorer 4.0 is included) to access the Internet Station through your network and set it up for your ISP. The Internet Station handles all dialing and Net connections for users on the network. A colleague and I

both worked through a single connection at the same time, with minimal degradation.

While the Internet Station has internal slots for two PC Card modems and a serial port for an external modem, you can use only one modem for Internet access. Other modems—if connected—are available through the network, just for faxing or BBS work.

—Stan Miastkowski

Intel InBusiness Internet Station

PRO: Shared Internet access for small businesses.

CON: Expensive.

VALUE: Pricey, but saves time for network neophytes.

Intel

800/538-3373

www.intel.com/network/smallbiz

List price: \$499

READER SERVICE NO. 706

Voice It: Get an Elephant's Memory

GADGET

IT HAPPENS IN a flash: While driving, shopping, or watching TV, I suddenly remember a task or chore I have to do. If I don't write down a reminder that instant, I usually

Voice It Digital Voice Recorder

PRO: Tapeless palm-size recorder sends messages to a PC.

CON: LCD screen requires a high level of ambient light, on/off switch is hard to use.

VALUE: Handy memory aid for the busy businessperson.

Voice It Worldwide Inc.

800/478-6423

www.voiceit.com

Street price: \$220

READER SERVICE NO. 707

forget it until it's too late. No calendar is handy.

That's why I find the **Voice It** recorder a great idea. Street priced at \$220 and sized like a deck of cards, this tapeless digital recorder takes down your thoughts and files them in one-button-accessible electronic folders that you name. Of course, pocket digital recorders aren't something new under the sun, but this product's PC Link feature is.

Attaching an included serial cable to my PC, I can send my recordings to a PC and decompress them from their proprietary, compressed format into a .wav



VOICE IT records your thoughts, then sends a copy of them to your PC.

sound file. (A 5-second Voice It file I converted was 26KB, but in .wav format it occupied a whopping 456KB.)

Because the memos are digital, I can quickly access any one of them, and add to it or delete it. On my PC, I can easily attach the files to e-mail messages or documents. It took me a while to get the hang of editing recordings, but I learned the PC transfer program in just 5 minutes.

Powered by two AAA batteries, the unit records up to 50 minutes with 2MB of memory. (A \$39 2MB flash memory card provides 50 more minutes.) A delete button lets you clean out the memory.

I have only two complaints: the tricky, recessed on/off button and the sometimes dim two-line screen. I can overlook those trifles because thanks to Voice It, I now have the memory of an elephant.

—Michael S. Lasky ►

\$1348

(or less)

Getting the highest quality TFT LCD monitor at an affordable price just became possible.

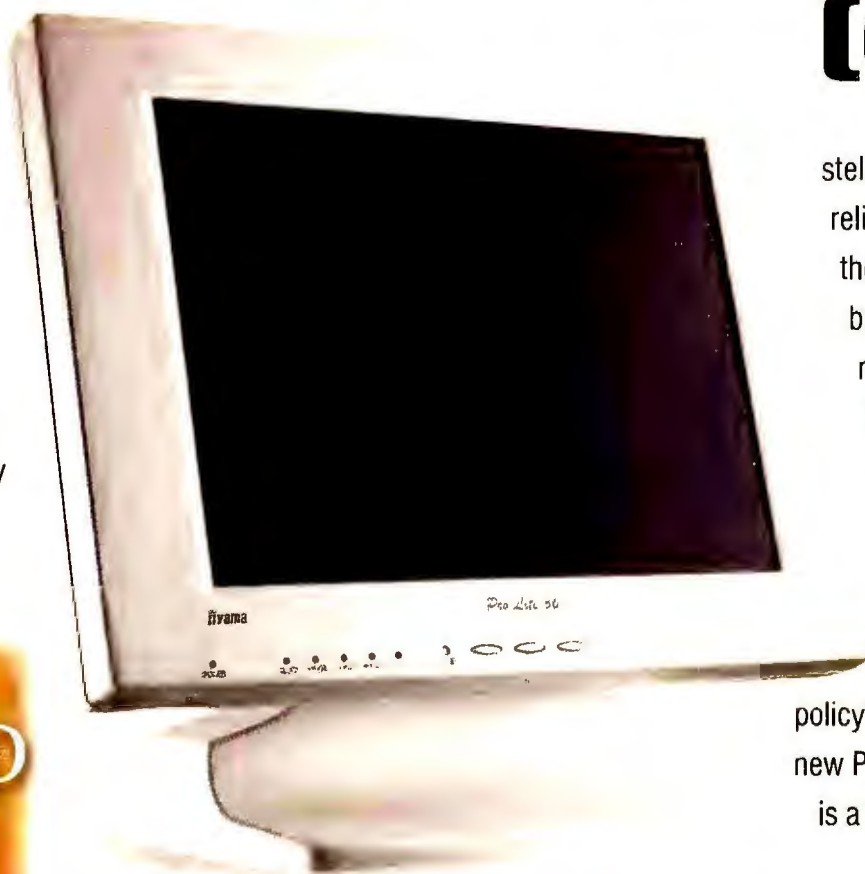
We've listened to our customers to combine the features you want at an unthinkable price. Our 14.1" active matrix TFT display produces brilliant, rock-steady

stellar performance, outstanding reliability, exceptional value, the latest technology, or the best warranty in the business? With iiyama's new ProLite 36 LCD, you make no tradeoffs.

Unbeatable price.

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Our exclusive *No Worries*[™] 3-year limited warranty policy*—it's easy to see why the new ProLite 36 from iiyamaDirect is a true champion.



**TFT
14.1" LCD**



1024 x 768 true resolution

1024 x 768 images at 75Hz. The sleek ProLite 36 panel is only 2.5" wide and its base conveniently includes a built-in power supply.

	iiyama ProLite 36	ViewSonic ViewPanel VP140	NEC LC0400V	Sceptra FT15G	CTX PanoView 630
Screen Size/Type	14.1"/TFT	14.0"/TFT	14.1"/TFT	14.5"/TFT	12.1"/TFT
Max. Resolution @ 75Hz	1024x768	1024x768	1024x768	1024x768	800x600
Minimum number of defective pixels for service or replacement	7, 2 if adjacent	7, 2 if adjacent	Depends on the count and location of the defects.	8	<19 White, 2 if adjacent <16 Dark, 2 if adjacent
Power Supply: Built-in/External	Built-in	External	Built-in	External	External
Warranty: Parts/Labor/Backlight	3/3/1 years	3/3/1 years	3/3/1 years	3/1/1 years	1/1/1 years
Price (Manufacturer's Estimated Price)	\$1,348	\$2,399	\$1,998	\$2,295	\$2,295



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January 6, 1998
Vision Master Pro 17



Perfect Five-Star Rating
January 1998
Vision Master 450
Vision Master Pro 500



Perfect Five-Star Rating
November 1997
Vision Master Pro 17



Performance & Technical Excellence
March 1997
Vision Master Pro 21



Six Time Winner
Jan 1997, Feb 1997, March 1997,
April 1997, May 1997, June 1997
Vision Master Pro 21



October 7, 1997
Vision Master Pro 17



March 1997
Vision Master Pro 21



Six Time Winner
July 1996, Jan 1997, March 1997,
July 1997, Sept 1997, Jan 1998
Vision Master Pro 17

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*Three year parts and labor, 1 year backlight. Comparative prices and specifications are based on information provided by the manufacturers as of 12/31/97. Manufacturer's Estimated Price is shown, actual price may vary.

Prices do not include shipping, handling, and any applicable taxes. Specifications are subject to change without notice. Offer valid only in the United States of America. As an Energy Star[™] Partner, iiyama has determined that this product meets the Energy Star[™] Guidelines for energy efficiency. For more information, please write us at 575 Anton Blvd., Suite 590, Costa Mesa, CA 92626. 888/663-2289, 714/437-5111; Fax: 714/437-5982; Home Page: www.iiyamadirect.com.

Circle 108 on reader service card

GoldMine 4.0 Strikes the Mother Lode

CONTACT MANAGER

SO, WHO IS THAT guy on line three—and how many widgets did he want to buy when last we spoke? If your livelihood entails tracking a large clientele, you want an industrial-strength contact manager. Based on my work with a shipping copy, the new **GoldMine 4.0** builds on the program's strengths for medium-size to large businesses that depend on teamwork to make sales.

Pricing starts at \$169 for a single user; it's \$695 for a five-user license. Like its main competitors, Symantec's Act and Maximizer Technologies' Maximizer, GoldMine stores any bit of information you'd like about a current or prospective customer. It helps you manage those relationships with tools ranging from e-mail and mail merge tools to personal and workgroup calendars for scheduling tasks, visits, and phone calls. However, GoldMine also adds basic sales forecasting, project management, and telemarketing support. GoldMine Software says the program can handle unlimited contacts (of course, your storage space is a limit).

GoldMine 4.0

PRO: E-mail and data-capture improvements.

CON: Importing capabilities could be better.

VALUE: Outstanding value for sales professionals.

GoldMine Software Corp.

800/654-3526

www.goldminesw.com

Street price: \$169 for a single user, \$695 for five-user license

READER SERVICE NO. 708

GoldMine's built-in POP3 mail center tracks both incoming and outgoing e-mail; other contact managers record only the mail you send. Also, you can now generate contact records directly from forms filled out by visitors to your Web site.

An enterprise version of GoldMine 4.0 adds support for several database back ends,

including Microsoft SQL, Oracle, and Informix; this version starts at a list price of \$1295 for five users.

Drawbacks? Though you can import existing GoldMine data into version 4.0, the new file format is different. As a result, if your workgroup shares data, all of you must upgrade to avoid compatibility

problems. GoldMine doesn't offer a Macintosh version, either; and the user interface, while highly customizable, is not as easy to master as Act 3.0's. I was also disappointed to find that GoldMine lacks a template for importing Lotus Organizer 97 data. Nonetheless, this release enhances GoldMine's stature as one of the most thorough contact managers in its price class.

—Yardena Arar

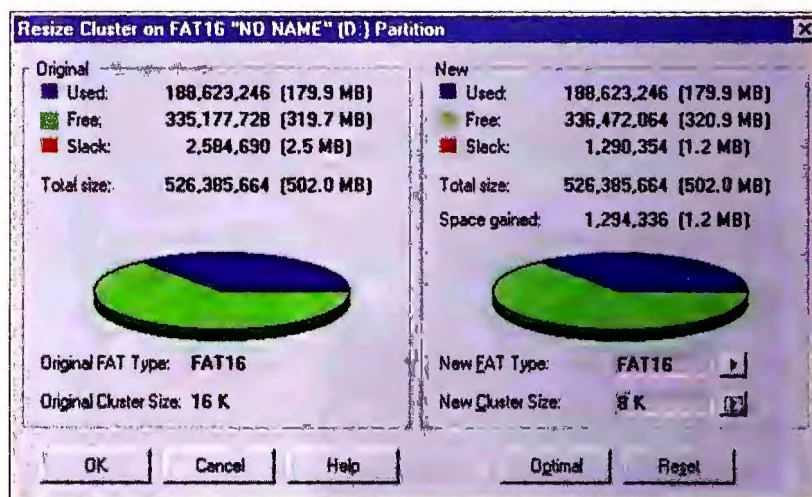
Divide and Conquer: New Partition-It

UTILITY

PARTITIONING A hard drive is a chore that makes people reach for a bottle of aspirin. But Quarterdeck's new **Partition-It Extra Strength** makes the worthwhile task virtually painless. Street priced at \$60, the utility is affordable—competitor PowerQuest's Partition Magic 3.0 sells for \$69.95—and improvements in the graphical interface make it an all-around good deal. (It also includes Select-It, a boot manager for working with multiple operating systems.)

Partitioning essentially divides your hard drive into smaller "virtual drives," which in turn use smaller "clusters"—the basic storage sections on a drive. Smaller clusters are more efficient and can save dozens of megabytes of space on an optimally partitioned drive.

A mere 20 minutes after installing a shipping version of Partition-It, I had easily split my 1.5GB hard drive into three 500MB partitions, reducing my cluster size from 32KB to 8KB. The on-screen instruc-



INSTANT STORAGE BOOST: Partition-It Extra Strength makes it easy to alter clusters on your hard drive for optimal storage space.

tions are easy to follow, and the help—both on screen and in the manual—is thorough.

One thing to watch: When you create a new partition, Partition-It assigns that new space the next drive letter in sequence. So if you partition your C: drive into two parts, the new partition will be given drive letter D:, and your CD-ROM drive, network drives, and removable-media drives will be bumped down—D: to E:, E: to F:, and so on.

This can create serious headaches. For example, if you're using a real-mode driver for your CD-ROM drive,

you'll have to adjust system files to reacquaint your PC with the CD-ROM drive—so follow the software and device manuals very closely.

—Glenn McDonald ►

Partition-It Extra Strength

PRO: Takes the pain out of hard drive partitioning.

CON: May require fiddling with some driver settings.

VALUE: Reasonably priced and effective hard drive improvement.

Quarterdeck

800/683-6696

www.quarterdeck.com

Street price: \$60

READER SERVICE NO. 709

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else

another *compatibility* headache

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Removable Feast: New Jaz and Orb Drives

STORAGE

WHEN YOU WORK with massive multimedia files, removable-media storage drives like the 100MB Iomega Zip and the 230MB SyQuest EZ-Flyer seem woefully inadequate. Even drives such as the original 1GB Iomega Jaz and SyQuest's 1.5GB SyJet often fail to meet your archival needs with the one or two disks they bundle. But two new drives that bump capacities up to 2GB per disk have arrived—Iomega's **Jaz 2GB** and the 2.16GB **Orb** from Castlewood Systems.

On the outside, the Jaz 2GB looks just like its predecessor, but under the hood it delivers higher performance, according to my tests of a shipping unit. Whereas the original Jaz drive had an average data transfer rate of 5.4 megabytes per second, the 2GB model



COOL JAZ:
Iomega's new drive accommodates a massive 2GB removable cartridge.

increases this rate to 7.4 MBps. Normally, a removable drive reads too slowly to play video well, but I could run video clips directly from the 2GB Jaz cartridge with only minor hiccups.

EASY INSTALL

MY TESTING also showed that Iomega isn't kidding when it says you can back up 2GB of data in 20 minutes. Installing the Jaz was quick work. The external SCSI model I used comes with a cable to plug into your PC's Ultra SCSI adapter. (If you don't have one, Iomega sells them for \$100 each.) On the included 2GB Jaz cartridge, you'll find software tools for backing up, organizing, and restoring data. You can also order adapters to convert the Jaz to a parallel port connection (\$50) or a PC Card interface (\$125) for use with a notebook. Iomega offers a \$99 battery pack too, so you can use the Jaz drive sans plug; the company says it lasts 2 hours and recharges in 2 hours. The new Jaz drive is compatible with older 1GB cartridges, letting you share disks with other Jaz users.

The 2GB Jaz drive costs from \$549 (internal version) to \$649 (external), while the

original Jaz drives run from \$300 (internal) to \$400 (external). The older 1GB disks cost \$100 apiece when purchased in a three-pack. The new 2GB disks, at \$149 each in a three-pack, give you more storage bang for the buck.

THE COMPETITION

ON PAPER, Castlewood Systems' new Orb drive sounds like a serious competitor to the Jaz 2GB, but the vendor could not give us a unit in time for this review. Castlewood says the Orb, which should be available in parallel port and internal IDE versions by the time you read this, stores 2.16GB on 3.5-inch removable cartridges and reaches a maxi-

Remote-Computing Bargain

WITH ITS FAST, friendly file-transfer and remote-control features, Traveling Software's \$149 LapLink has long been a telecommuter's best friend. Now the company has spun off LapLink's remote-control tools into **Remote DeskLink**, a \$50 stand-alone package. Like LapLink, Remote DeskLink makes it easy to control a distant PC over the Internet or a direct modem connection. This is a great way to check the corporate e-mail system or take a peek at a document on your work PC from home. What you can't do is transfer files back and forth. However, Remote DeskLink is a good value for what it does. Traveling Software; 800/343-8080; www.travsoft.com.

READER SERVICE NO. 712

—Harry McCracken

mum data transfer rate of 12.2MBps. An external SCSI model ships in May.

All three Orb drives will sell for \$199. Individual cartridges will cost only \$30—much less than other removable-storage drives. If the Orb performs well, it will be a worthy competitor in the removable-media storage market.

—Dean Andrews ►

Jaz 2GB

PRO: Fast performance, large-capacity media.

CON: Expensive drive and disks.

VALUE: Still one of the better choices.

Iomega Corp.

800/697-8833

www.iomega.com

Street price: \$649 external, \$549 internal

READER SERVICE NO. 710

Orb

PRO: Inexpensive.

CON: Performance has not been tested.

VALUE: Worth watching.

Castlewood Systems Inc.

510/224-9900

www.castlewoodsystems.com

Street price: \$199

READER SERVICE NO. 711



2.16GB FOR \$30: With media this cheap, Castlewood Systems' \$199 Orb drive has obvious appeal; but speed tests are yet to come.

corporate

international

research & development

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human resources

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accounting

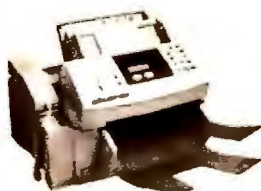
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Sound Decisions: Affordable PCI Audio Cards

SOUND CARD

SOUND CARDS have a public-image problem that would challenge a Washington, D.C., spinmeister. For years, compatibility problems caused unsuspecting buyers hours of anguished troubleshooting. Faced with so daunting a prospect, most people simply closed their eyes and bought Creative Labs' Sound Blaster boards, since they offered the least chance of trouble with games and CD-ROM titles.

The situation is improving, but all is not perfect yet, as I learned when I installed shipping versions of the Diamond **Monster Sound M80** and VideoLogic **SonicStorm**. Both are members of a new generation of cards that use a system's fast PCI bus to provide wavetable MIDI playback, using instrument sounds stored in system RAM. Both boards provide 32-voice polyphony,

Monster Sound M80

PRO: Great documentation, less-troublesome installation.

CON: Doesn't support top number of sound channels.

VALUE: Affordable choice for serious game fans.

Diamond Multimedia Systems

800/468-5846

www.diamondmm.com

Street price: \$100

READER SERVICE NO. 713

SonicStorm

PRO: Feature rich.

CON: Very difficult to install.

VALUE: Wins the price game.

VideoLogic Corp.

800/578-5644

www.videologic.com

Street price: \$90

READER SERVICE NO. 714



DIAMOND'S NEW PCI SOUND CARD MAKES THE CUT: The **Monster Sound M80** is a price-wise choice for games with 3D sound.

which means they can produce 32 individual instrument sounds simultaneously.

Most important, both of these boards can juggle multiple channels of independent audio—whereas ISA cards can muster just one. Having that capacity means the cards can work with Microsoft's DirectX technology to produce vivid sounds and "3D" audio effects for Windows 95 software.

THE IRQ SHUFFLE

I EXPERIENCED installation hassles with both boards as I tried to make them get along with my Gateway 2000 Pentium-90 PC. Of the two, I'd recommend the **Monster Sound**, which provided great, consumer-friendly packaging and documentation and a less troublesome installation. But the **Monster Sound** was unable to find a free IRQ in my loaded system until I removed an ISDN card, freeing IRQ 15.

The \$90 **SonicStorm** did even worse, locking up during driver installation and forcing me into Safe Mode operation before I was able to get the board to work.

GAMING GOODIES

BOTH PRODUCTS support Microsoft's DirectSound 3D and Aureal's A3D audio, enabling real-time 3D audio in Windows 95-based games.

Both also come with an array of software for playing, editing, and creating .wav and MIDI audio files, plus DirectX 5.0 driver software and a series of demos for testing 3D features. Another key feature is positional 3D audio, which allows games and other software to create the illusion of Surround Sound from a two-speaker set.

The **SonicStorm** provides superior multichannel capability, supporting 64 audio channels versus the **Monster Sound**'s 23. But few games or titles are likely to take advantage of the additional channels in the near future.

A final note: If you read February's *New Products*, you may be wondering how this \$100 Diamond **Monster Sound M80** differs from the \$150 **Monster Sound** card we previously reviewed. Diamond is replacing that original card with the \$150 **Monster Sound MX200**, which supports four

Cell Phone on a Card

GLOBEWAVE's **Com.plete PC Card** is accurately named: Combining cellular voice, data, and fax with landline voice, data, and fax abilities, this Type III PC Card gives you unusual flexibility. The \$499 card establishes landline or cellular phone service based on which of the included cables are plugged into it. The landline RJ-11 cord handles wired communications like any phone or fax device in your home or office. Insert the combined earphone-microphone cable without the landline cords, and the card is ready for cellular service. When inserted in a notebook's PC Card slot, the fax-modem operates at 14.4 kbps in landline mode, 9.6 to 14.4 in wireless mode. Alternatively, you can attach the **Com.plete PC Card** to an optional \$49 cellular phone shell to replace your traditional cell phone. **GlobeWave Inc.**; 201/843-7202; www.globewave.com.

READER SERVICE NO. 715

—Michael Lasky

speakers (versus two for the **M80**), comes with 4MB of on-board ROM for MIDI sounds (versus 2MB for the **M80**), and supports 64-voice polyphony. Of course, both cards can use system RAM for storing MIDI samples under Windows 95, but if you're an audiophile or a serious gamer who wants quadraphonic sound and superior system performance while playing high-quality wavetable MIDI scores, you may find that the **MX200** is a better choice.

—Michael Desmond

For more information about a product, contact the manufacturer or circle the number on the reader service card. ■

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advises me

on all the **leading brands,**

custom-configures them to my specifications,

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MINI-NOTEBOOKS

TOSHIBA Libretto 70CT

▶ 120MHz Intel Pentium® processor with MMX™ technology ▶ 16MB EDO DRAM standard ▶ 1.58GB hard drive ▶ 1.44MB external 3.5" floppy drive with PC Card connector ▶ 6.1" active-matrix display ▶ Sound Blaster® compatible sound ▶ Lithium ion battery ▶ Windows® 95 operating system ▶ 1-year parts and labor warranty

\$1949⁸⁷

CDW 100404



166MHz INTEL PENTIUM® MMX

TOSHIBA Satellite Pro 460CDX

▶ 166MHz Intel Pentium® processor with MMX™ technology ▶ 256KB Level 2 cache ▶ 32MB EDO RAM standard ▶ 2.02GB hard drive ▶ 10X CD-ROM drive ▶ 12.1" dual-scan display ▶ Windows® 95 operating system ▶ 3-year parts and 1-year labor warranty; 1-year battery

\$1977³⁷

CDW 100405

133MHz INTEL PENTIUM® MMX

TOSHIBA Satellite Pro 440CDX

▶ 133MHz Intel Pentium® processor with MMX™ technology ▶ 256KB Level 2 cache ▶ 16MB EDO RAM standard ▶ 1.34GB hard drive ▶ 10X CD-ROM drive ▶ 12.1" FastScan dual-scan display ▶ 8-bit color at 800 x 600 resolution ▶ Windows® 95 or Windows for Workgroups V3.11 operating system ▶ Weight: 6.9 lbs. ▶ 3-year parts and 1-year labor warranty

\$1549⁴⁶

CDW 90351

COMPAQ Armada 1530DM

▶ 133MHz Intel Pentium® processor with MMX™ technology ▶ 256KB Level 2 cache ▶ 16MB EDO RAM standard ▶ 1.4GB hard drive ▶ 10X CD-ROM drive ▶ Integrated 33.6K bps data/fax modem ▶ 12.1" dual-scan display ▶ 8-bit color at 800 x 600 resolution ▶ Windows® 95 operating system ▶ Weight: 7.4 lbs. ▶ 1-year world-wide limited warranty

\$1798⁶⁷

CDW 91507

200MHz INTEL PENTIUM® MMX

COMPAQ Armada 7360DMT

▶ 200MHz Intel Pentium® processor with MMX™ technology ▶ 256KB Level 2 cache ▶ 32MB EDO RAM standard ▶ 3GB hard drive ▶ 33.6K bps modem ▶ 12.1" active-matrix display ▶ 32-bit CardBus and Zoomed Video support ▶ Windows® 95 operating system ▶ 3-year limited warranty

\$3715⁴⁷

CDW 101205

LEASE \$130*



LEASE \$126*

ThinkPad® 770

▶ 200MHz Intel Pentium® processor with MMX™ technology ▶ 512KB Level 2 cache ▶ 32MB SyncDRAM standard ▶ 3.2GB hard drive ▶ 13.3" XGA active-matrix display ▶ 16-bit color at 1024 x 768 resolution ▶ 32-bit CardBus and Zoomed Video support ▶ Windows® 95 operating system ▶ 3-year parts and labor warranty

\$3597⁶⁷

CDW 94545

150MHz INTEL PENTIUM® MMX



ThinkPad® 380D

▶ 150MHz Intel Pentium® processor with MMX™ technology ▶ 256KB Level 2 cache ▶ 16MB EDO RAM standard ▶ 2.1GB hard drive ▶ 8X CD-ROM drive ▶ 12.1" active-matrix display ▶ Windows® 95 operating system ▶ 1-year limited warranty

\$1998⁸⁷

CDW 86305

COMPAQ

Armada 7330T

▶ 150MHz Intel Pentium® processor with MMX™ technology ▶ 16MB RAM standard ▶ 2.1GB hard drive ▶ 12.1" active-matrix color display ▶ Windows® 95 operating system ▶ Lithium ion battery

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and 33.6K bps
modem!

233MHz INTEL PENTIUM® MMX



ThinkPad® 770

▶ 233MHz Intel Pentium® processor with MMX™ technology ▶ 512KB Level 2 cache ▶ 32MB SyncDRAM standard ▶ 5.1GB hard drive ▶ 14.1" active-matrix display ▶ 33.6K bps data/fax modem ▶ Windows® 95 operating system ▶ Weight: 7.82 lbs. ▶ 3-year parts and labor warranty

\$4937⁸⁷

CDW 94547

LEASE \$172*

266MHz INTEL PENTIUM® MMX

TOSHIBA New! Tecra 550CDT

▶ 266MHz Intel Pentium® processor with MMX™ technology ▶ 512KB Level 2 cache ▶ 32MB EDO DRAM standard ▶ 3.82GB hard drive ▶ 20X CD-ROM ▶ 12.1" active-matrix display ▶ 56K bps (K56flex) modem ▶ 16-bit SoundBlaster Pro compatible sound ▶ Windows® 95 operating system

\$3847⁶³

CDW 105042

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- ▶ 166MHz Intel Pentium® processor with MMX™ technology
- ▶ 256KB Level 2 cache
- ▶ 16MB SDRAM standard
- ▶ 2.1GB EIDE hard drive
- ▶ Integrated S3/V2 enhanced 64-bit graphics
- ▶ Windows® 95
- ▶ Intelligent Manageability
- ▶ 3-year limited warranty

\$877⁸⁶ CDW 92269



IBM PC 300GL

- ▶ 166MHz Intel Pentium® processor with MMX™ technology
- ▶ 256KB Level 2 cache
- ▶ 16MB SDRAM standard
- ▶ 2.5GB EIDE hard drive
- ▶ Cirrus Logic 5446 graphics
- ▶ LANdesk client manager
- ▶ Windows® 95
- ▶ 3-year limited warranty

\$874³⁸ CDW 89298

200MHz INTEL PENTIUM® MMX

COMPAQ Deskpro 2000

- ▶ 200MHz Intel Pentium® processor with MMX™ technology
- ▶ 256KB Level 2 cache
- ▶ 16MB SDRAM standard
- ▶ 2.1GB EIDE hard drive
- ▶ Integrated S3/V2 enhanced 64-bit graphics
- ▶ Windows® 95
- ▶ Intelligent Manageability
- ▶ 3-year limited warranty

\$968⁶⁷ CDW 92840



HP Brio 8014 PC

- ▶ 200MHz Intel Pentium® processor with MMX™ technology
- ▶ 256KB Level 2 cache
- ▶ 16MB RAM standard
- ▶ 2.1GB EIDE hard drive
- ▶ S3 Trio64V2 graphics
- ▶ McAfee Virus Scan
- ▶ Windows® 95
- ▶ Mini-tower case
- ▶ 3-year limited warranty

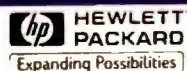
\$899⁵⁷ CDW 95052

233MHz INTEL PENTIUM® MMX

COMPAQ Deskpro 2000

- ▶ 233MHz Intel Pentium® processor with MMX™ technology
- ▶ 256KB Level 2 cache
- ▶ 16MB SDRAM standard
- ▶ 2.1GB EIDE hard drive
- ▶ Integrated S3/V2 enhanced 64-bit graphics
- ▶ Windows® 95
- ▶ Intelligent Manageability
- ▶ 3-year limited warranty

\$1085³⁷ CDW 101308



HP Brio 8017 PC

- ▶ 233MHz Intel Pentium® processor with MMX™ technology
- ▶ 256KB Level 2 cache
- ▶ 32MB RAM standard
- ▶ 3.2GB EIDE hard drive
- ▶ S3 Trio64V2 graphics
- ▶ McAfee Virus Scan
- ▶ Windows® 95
- ▶ Mini-tower case
- ▶ 3-year limited warranty

\$1137⁸⁴ CDW 95053

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233MHz INTEL PENTIUM® II



HP Vectra VL Pentium II PC

- ▶ 233MHz Intel Pentium® II processor
- ▶ 512KB Level 2 cache
- ▶ 32MB EDO RAM standard
- ▶ 2.5GB EIDE hard drive
- ▶ 2MB Cirrus Logic graphics
- ▶ Two USB ports
- ▶ Windows® 95
- ▶ 3-year limited warranty

\$1289⁹⁰ CDW 101092

COMPAQ Deskpro 2000

- ▶ 233MHz Intel Pentium® II processor
- ▶ 256KB Level 2 cache
- ▶ 32MB SDRAM standard
- ▶ 2.1GB Ultra ATA hard drive
- ▶ 2MB SGRAM Matrox enhanced 64-bit graphics
- ▶ Intelligent Manageability
- ▶ Windows® NT Workstation V4.0
- ▶ 3-year limited warranty

\$1298⁷⁸ CDW 95916

266MHz INTEL PENTIUM® II



HP Vectra VL Pentium II PC

- ▶ 266MHz Intel Pentium® II processor
- ▶ 512KB Level 2 cache
- ▶ 32MB EDO RAM standard
- ▶ 2.5GB EIDE hard drive
- ▶ 2MB Cirrus Logic graphics
- ▶ Two USB ports
- ▶ Windows® 95
- ▶ 3-year limited warranty

Monitor sold separately



\$1576⁶⁹ CDW 100079

300MHz INTEL PENTIUM® II



HP Vectra VL Pentium II PC

- ▶ 300MHz Intel Pentium® II processor
- ▶ 512KB Level 2 cache
- ▶ 32MB EDO RAM standard
- ▶ 4GB EIDE hard drive
- ▶ 2MB Cirrus Logic graphics
- ▶ Two USB ports
- ▶ Windows® NT Workstation V4.0
- ▶ 3-year limited warranty

\$1897⁵⁶ CDW 102366

COMPAQ Deskpro 2000

- ▶ 300MHz Intel Pentium® II processor
- ▶ 512KB Level 2 cache
- ▶ 32MB SDRAM standard
- ▶ 3.2GB Ultra ATA hard drive
- ▶ 24X Max CD-ROM drive
- ▶ 2MB SGRAM Matrox enhanced 64-bit graphics
- ▶ Windows® NT Workstation V4.0
- ▶ Mini-tower case
- ▶ 3-year limited warranty

\$1987⁷⁶ CDW 95920

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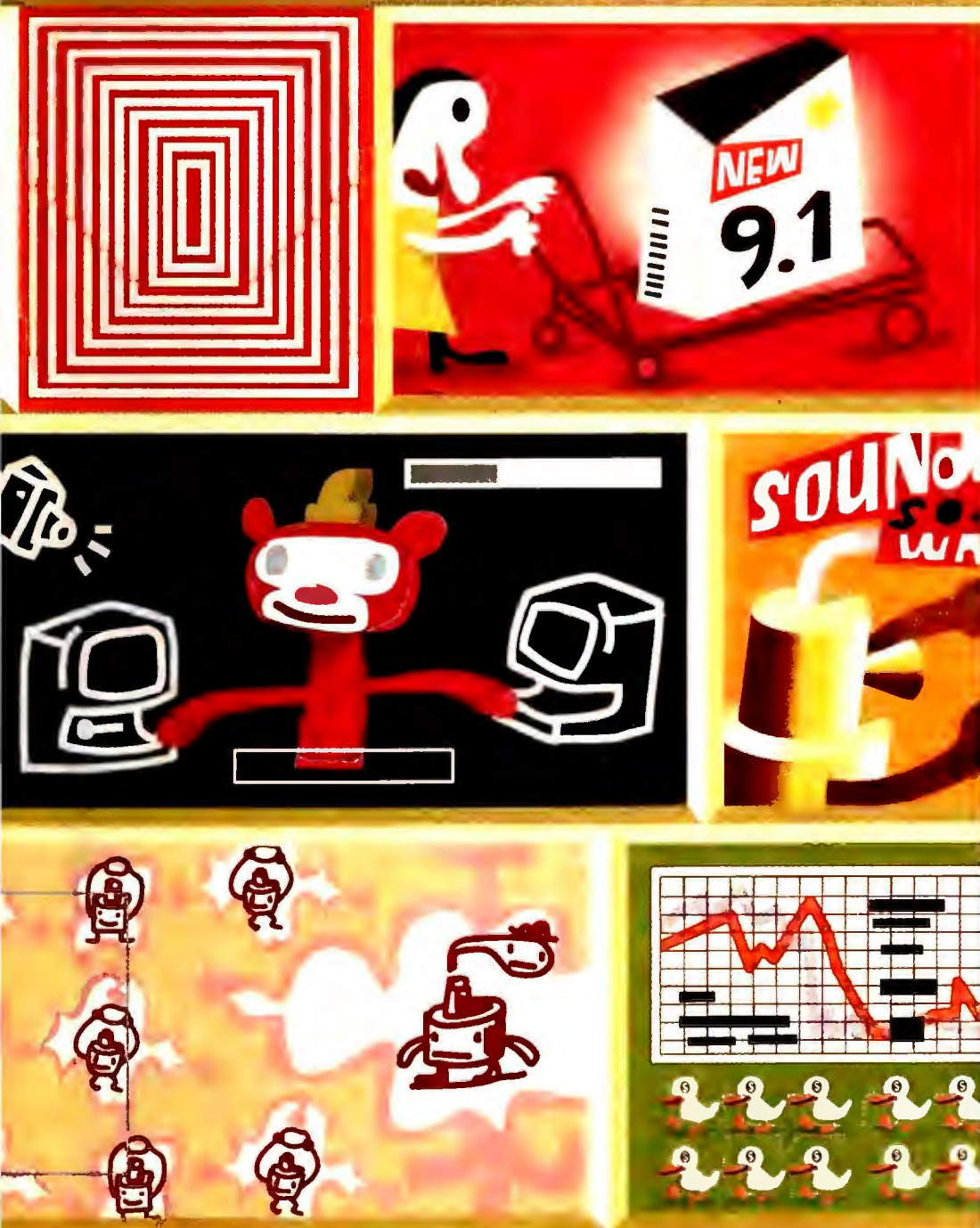
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On



and services—at a price you can't beat.

line



COVER STORY

THERE'S NO SUCH THING as a free lunch. You get what you pay for. Want something for nothing? *Fahgeddaboutit.*

It's a cynical world out there. Even on the Internet—the last refuge of the giveaway—it's getting harder to find *good* stuff for free. Want to visit Wall Street Journal Interactive or ESPNNet? Get out your wallet. And as more Web sites figure out how to charge for their wares, the squawk of your modem may be replaced by the *ka-ching* of a cash register.

But all is not lost. There is still high-quality free stuff to be had—you just have to dig deeper and look harder. In this, our third annual collection of the best free stuff online, we did exactly that. ►

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This year we focused on free stuff you can actually use, not just Web pages splattered with a little information and a lot of advertising. Our intrepid freebie hunters combed hundreds of sites and selected the best Windows utilities, productivity apps, browser plug-ins, and interactive games that money can't buy. Along the way, we uncovered some excellent shareware packages—software you can try for free and then pay for if you choose to keep it. We identified the best places to download drivers, sign up for free Web services, get free financial information, and talk back to Uncle Sam. We even uncovered sites that let you earn frequent-flyer miles or get a free can of baked beans, simply by surfing the Web.

Add it all up, and you've got the best of the Net at the best price: free. Even a cynic can appreciate that.

KEY TO ICONS

⌚ Time next to clock icon is average download time with a 28.8-kbps modem.

Ⓢ Shareware with free trial period; listed Web site is where software was originally found.

Most software reviewed is also available for download from PC World Online at www.fileworld.com.

Best Free Windows Utilities

Make Shortcuts Do More Winx32

Do you want to launch both Word and Excel with a single Shortcut? Or launch Eudora, wait 2 minutes for your e-mail to download, then open your browser? All this is possible when you point your Shortcuts to Winx32, a macro-style program that launches other programs to your specific instructions. ⌚ <1 min. winx3216.zip, 100KB, www.simtel.net/simtel.net/win95/util.html

Save Disk Space Diskdata

It's 6 o'clock. Do you know how much disk space your files are occupying? Probably not. On many systems, even a 1-byte file wastes 32KB of space on your hard

FileWorld One-Stop Downloading

CAN'T FIND THAT PERFECT LITTLE UTILITY? Try PC World Online's very own FileWorld (www.fileworld.com), which features thousands of shareware, freeware, and running demos of programs in all categories, from the serious (antivirus) to the sublime (screen savers). Browse our categories, or search by keyword. Find files mentioned in various articles, including this one, under the heading 'Featured Files'. All the files are checked for viruses and are updated as new versions become available. A power-search tool allows you to quickly pinpoint the exact item you want according to file name, author, subject, or file size, among a number of other options.



drive. Diskdata tells you how much space each drive, folder, and subfolder is really taking up—something Windows itself won't let you know. It's a great tool for helping you decide what to archive and when to partition. ⌚ 2 min. ddsetup.exe, 364KB, www.digallery.com/diskdata

Magnify Your Screen Screen Loupe for Windows 95/NT 3.5

Ever find yourself squinting at the fine print displayed on your PC screen? Then scope out Screen Loupe. This handy utility gives you a close-up view of whatever part of the screen you're pointing to—magnified up to eight times. You can save the contents of the Loupe window to Windows' Clipboard, which is handy for printing the larger, magnified version of your screen image. ⌚ <1 min. loupe32.zip, 102KB, www.execpc.com/~sbd

Secure Your Files CodedDrag 1.52

Getting just a bit paranoid? Then download CodedDrag, an encryption program that integrates into Windows, letting you drag or right-click from Explorer to safeguard files, directories, and drives. You choose the intensity of encryption you want, from basic 56-bit-key DES to top secret 448-bit-key Blowfish. ⌚ 6 min. cd1500.exe, 1.07MB, www.fim.uni-linz.ac.at/codeddrag/codeddrag.htm

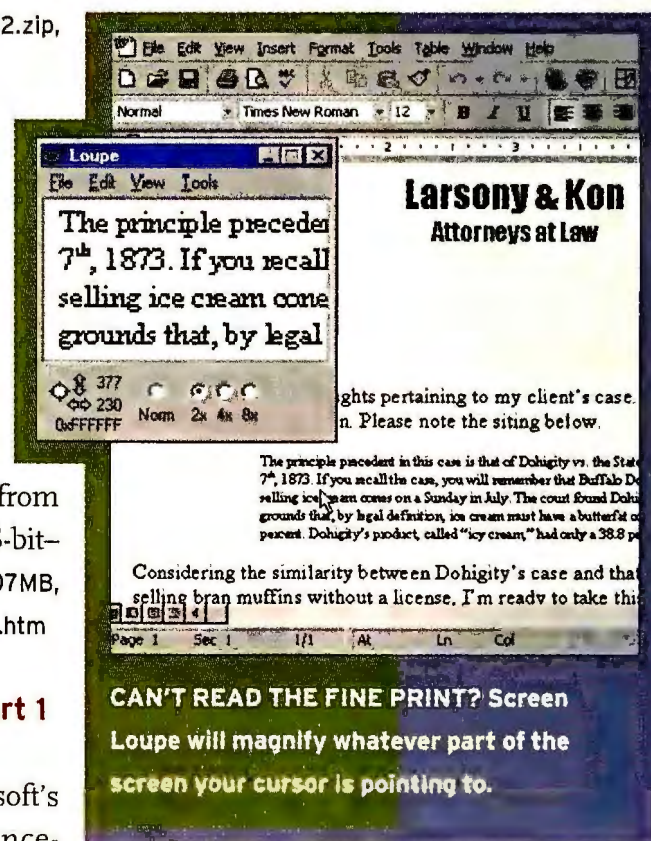
Get Microsoft's Hidden Stash, Part 1 PowerToys

Call it Windows 95-and-a-half. Microsoft's great collection of interface enhance-

ments is a must-have for any Win 95 user. PowerToys makes it easier to dig inside a folder's contents, take the Internet Explorer icon off your desktop, conveniently change screen resolution without rebooting, and click desktop icons when you've got windows in front of them. ⌚ 1 min. powertoy.exe, 204KB, www.microsoft.com/windows95/info/powertoys.htm

Edit Text on the Fly Super NoteTab

Editing .txt, .bat, .ini, and other ASCII text files with a word processor is like washing your car with a fire hose. But Windows' NotePad is a poor substitute for the real thing, so replace it with the best text editor out there. Super NoteTab lets you edit multiple files and toggle word wrap on and off, and doubles as an HTML editor,



CAN'T READ THE FINE PRINT? Screen Loupe will magnify whatever part of the screen your cursor is pointing to.

with buttons for viewing a file in your browser and for following links. ⌚ 4 min. snt263e.zip, 729KB, www.unige.ch/sciences/terre/geologie/fookes

Get Microsoft's Hidden Stash, Part 2 Kernel Toys

If you want more power in your PowerToys, check out Microsoft's other collection of enhancements. If you're a heavy gamer, you'll want its wizard for creating custom exit-to-DOS environments. If you don't like where your <Ctrl>, <Alt>, and special Windows keys are, remap them. A lot of the tools are on the nerdy side, but some are highly useful for the rest of us. ⌚ <1 min. krnltoys.exe, 55.7KB, www.microsoft.com/windows95/info/kerneltoys.htm

Maximize Your Clipboard

Yankee Clipper Plus

With Windows' Clipboard, it's use it *and* lose it—every time you copy a new item to the Clipboard, the last one gets deleted. To the rescue comes Yankee Clipper, which saves up to 50 Clipboard text-only items for later retrieval. It's a handy device for keeping collections of boilerplate text—such as your return address—that you

would otherwise have to re-type frequently. A shareware version may be available by the time you read this article, but the freeware one won't go away. ⌚ 1 min. ycplus.zip, 43KB, www.tiac.net/users/lvasseur/ycphome.html

Hide Your Windows

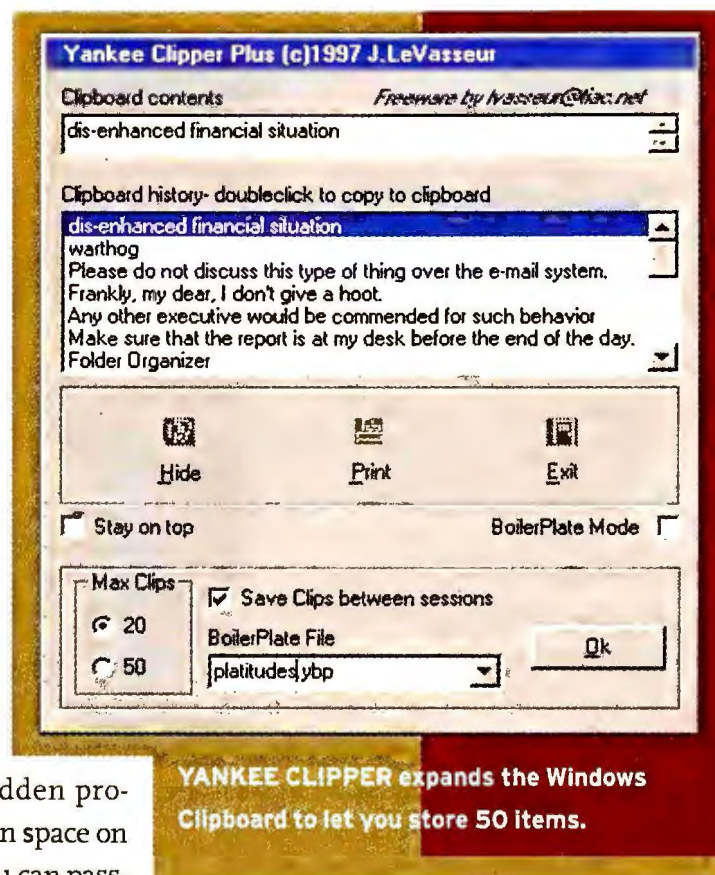
OuttaSight

Too many items on your Windows 95 Taskbar? Don't want the boss to see that you're playing Riven? With OuttaSight you can conceal any active window. Customizable options let you hide programs as you minimize them, and show the hidden programs in the system tray (the icon space on the right of the Taskbar). And you can password-protect the program so that others can't see what you've hidden. ⌚ 2 min. os112.zip, 390KB, rosa.simplenet.com/oos/

Serve Your Folders on a Tray

Folder Organizer

Folder Organizer puts access to My Documents, the Start menu, and your own



YANKEE CLIPPER expands the Windows Clipboard to let you store 50 items.

favorites on the system tray (the screen to the right of the Start button) where you can always find them. As a bonus, the program gives you an easy way to clear various caches and history lists, and lets you change your screen mode without rebooting. ⌚ 3.5 min. fldor100.exe, 682KB, tp.ic.ehu.es/jma.html

Six Steps for Smart Downloading

1 Avoid rush hour. Visit the Internet Traffic Report site (www.andovernews.com/trafficreport.html) for a quick update on just how glacially the Web is moving at the moment. The slowest times are when everybody's online—typically from 5 p.m. to 2 a.m. EST.

2 Try alternate routes. If the first download site you visit is down, use a search engine to look for others that offer the file you need. This trick is especially easy with HotBot (www.hotbot.com). If a site offers multiple sources for downloads, begin with the one that's closest to you geographically. Also try selecting a server in a time zone that's in a light-traffic part of the day.

3 Keep current. Not all sites do a stellar job of keeping up-to-date, so it's a good idea to check out a shareware vendor's own site to determine the most current release version, even if you ultimately download the file elsewhere. For instance, visit www.winzip.com to find the current version of Nico Mak's WinZip.

4 Use a good zip utility. Here are two of the best. Download Butler from Lincoln Beach Software (\$29.95, www.lincolnbeach.com) not only decompresses your downloaded files but also tracks them, so you'll never forget the directory where you saved a file, or the site you obtained it from. Mijenix's ZipMagic (\$39.95, www.zipmagic.com)

shows zipped files as folders, allowing you access to the individual files stored within the compressed set. Both are shareware, with 30-day free trials.

5 Stay organized. When downloading .zip files, don't just dump them into the default folder. Rather, you need to create a folder (or folders) specifically for compressed archives, so that they don't get lost among unrelated files.

6 Clear out all the clutter. The more free stuff you download, the quicker your hard disk will fill up with old .zip files and setup routines. Once you

have unzipped a file and completed a program setup, make sure that you delete all of the files that you don't need; an uninstaller program such as Quarterdeck's CleanSweep (www.quarterdeck.com) can help. —H.M.



Open Zip Files Instantly

EZip Wizard

It's simple: EZip Wizard decompresses .zip archives on the fly, expanding the file as it's downloaded. Or if you prefer, you can actually install a downloaded program without unzipping it first. If you want to compress files, you'll have to pay the \$29.95 registration fee and get the full version. For decompression only, it's free. ⌚ 3 min. e32setup.exe, 581KB, www.edisys.com

Jog Your Memory

Eh Windows Reminder

Forget something? Put Eh Windows Reminder in your Startup folder, and every time you load Windows you'll get today's messages, from the weekly 'Back up your system' to the annual 'Mom's birthday next week'. The user interface is clumsy—but it's *still* easier than remembering. ⌚ 1 min. eh131.exe, 295KB, lcp07.lc.ehu.es/jma.html

Cut Out Shortcuts

Start Menu Cleaner

Ever suspect that your program Shortcuts are breeding down there in Windows' Start menu? Start Menu Cleaner will search the desktop and Start menu for surplus Shortcuts and empty folders, then asks your permission to delete. ⌚ <1 min. clean13.zip, 27KB, www.mithril.d.se

Make It Truly "My Computer"

X-Setup

Here's one great 18-tab dialog box for changing just about everything about

Windows' configuration. X-Setup has options for clearing various histories and caches, speeding up the Start menu, autoplaying CD-ROMs, and setting your document and Windows installation

and a handy folder-based filing system, and it lets you format documents using Windows' conventional <Ctrl>-x keystrokes. The program also displays and prints ANSI characters and has other fea-

tures normally found in pricier packages. ⌚ 5 min. yw32.exe, 1.1MB, www.yeah-write.com

Free E-Mail, No Web Access Required

Juno

Want to send and receive e-mail without getting stuck on the Net? Juno may be your best bet. Unlike Web-based mail services, Juno

uses its own private network. Just dial one of Juno's local access numbers to read, write, send, and receive e-mail. It's perfect for people who are unwilling to pay for an Internet service provider. The catch? You have to look at ads while online, and Juno doesn't support file attachments. ⌚ 7 min. junoinst.exe, 1.37MB, www.juno.com

An Easygoing PIM

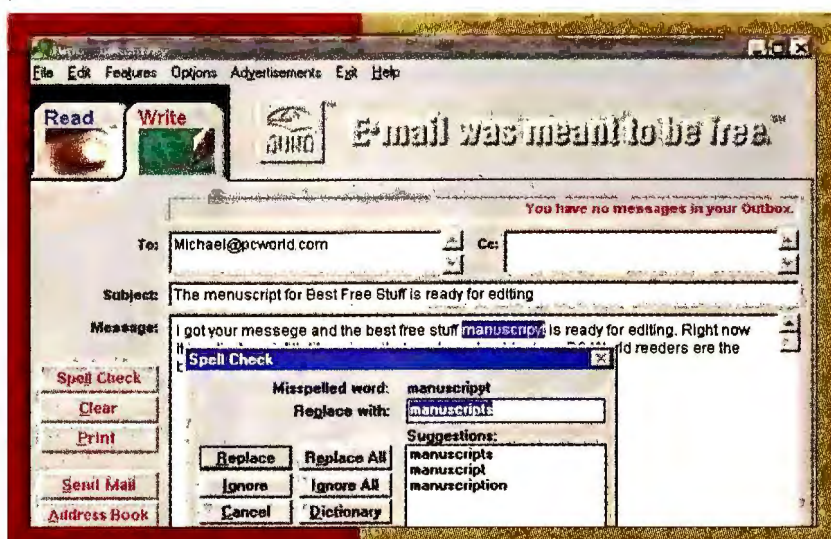
Above & Beyond 98

You don't need to overload your PC with Outlook 98 to get a good personal information manager: Above & Beyond 98's calendar, to-do list, and group-aware scheduler are good enough to verge on low-end project management. The program handles alarms and recurring appointments; packs many printing views and options; and sports an entire Juggle menu to help you even out your workload. ⌚ 6.5 min. Ⓢ \$49, 30-day free trial. ab98sx06.exe, 1.3MB, www.1soft.com

A Database on Home Base

Instabase 3.0.1

Databases don't need to be intimidating, expensive, or even big. Instabase is more accessible and approachable than its famous-name competition. You can build flat-file databases using name fields and frames, and include graphics using a copy/paste option. The program even recognizes Web and e-mail addresses: Double-clicking on such addresses in the database automatically lets your browser retrieve them. ⌚ 15 min. Ⓢ \$29, 30-day free trial. 3.2MB, www.instabase.com



JUNO'S free e-mail service even has a spelling checker—and doesn't need Net access.

paths. Now if it only had a 'Keep Windows from crashing' option... ⌚ 1 min. xset20.zip, 174KB, www.kos.org

Best Freeware and Shareware Apps

Not-So-Light E-Mail

Eudora Light 3.0.5

It takes more than a \$0 price tag to make an e-mail client as popular as Eudora Light. It takes strong message filtering, a solid Find function, and built-in PGP encryption to safeguard the privacy of your messages. The \$39 full version, Eudora Pro Email 4.0, adds such features as the ability to reply with automated responses and to view attachment files

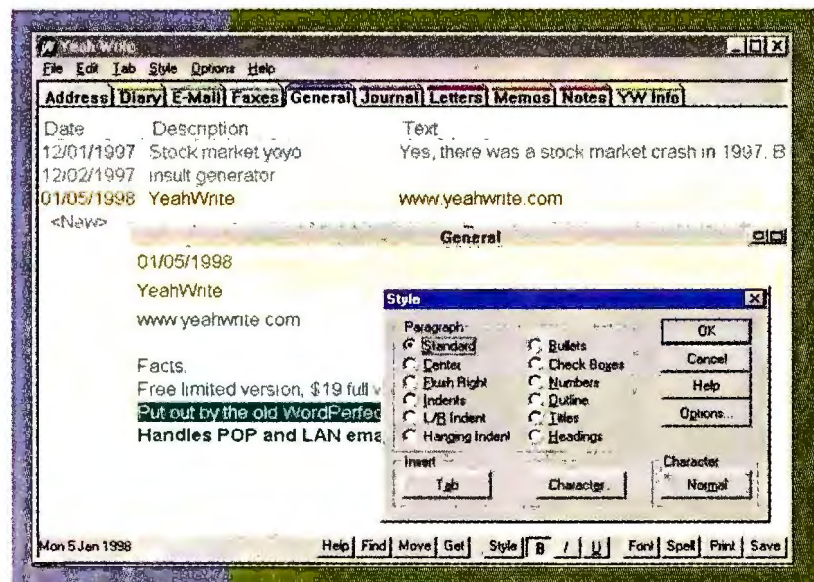
without the originating app, multiple e-mail account access, and a customizable address book. But for many users, Light is just right. ⌚ 22 min. eul.exe, 4.5MB, www.eudora.com

Write On

Yeah Write 1.2

for Windows

If Microsoft Word is the 800-pound gorilla of word processors, Yeah Write is a smaller and nimbler primate. It uses a fill-in-the-blanks approach



YEAH WRITE 1.2 is a small but powerful alternative to large word processors.

Trialware Try Before You Buy



BUYING anything sight unseen is risky. Fortunately, more and more commercial software vendors let you audition their wares before you make a purchase by offering free "trialware" (aka *demoware*) versions that can be downloaded from their Web sites. Here are the most common types you'll find:

Nag-free trialware. The most appealing trialware is fully functional from the get-go, and it stays that way. Classic examples include Jasc's **Paint Shop Pro** (www.jasc.com) and Nico Mak's **WinZip** (www.winzip.com). You are still obligated to pay for the software once the trial period is up, but at least you'll experience the full-blown package before you make a buying decision-

without seeing those annoying "register please" windows each time you launch the application.

Limited-time versions. The dominant breed of trialware among major commercial vendors is fully functional for a trial period only. In some cases, you can then buy the product online and receive a code that unlocks your trialware, turning it into the full version. See Symantec's trialware page (www.symantec.com/trialware) for a good selection of such packages, which are all top utilities.

Feature-disabled versions. Less common than limited-time trialware, feature-disabled version don't time-out after a trial period, but they do lack one or more features vital to getting

real work done. For instance, Adobe (www.adobe.com) offers "Tryout" editions of many of its graphics packages. They do everything the full versions do—except save, print, or export.

"Lite" versions. To publicize their more powerful commercial products, a few generous vendors offer free stripped-down versions of their packages. Two fine examples are Qualcomm's **Eudora Light** (www.eudora.com) e-mail program, which lacks advanced features such as format filters (see "Best Freeware and Shareware Apps"), and Maximizer Technologies' **Maximizer Lite** (www.maximizer.com), a basic personal information manager that is able to handle as many as 100 contacts. —H. M.

Master Your Business in a Snap Business Plan Master 3.1

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Quickie Spreadsheet VistaCalc

If you really must have the latest Microsoft Excel with Small Business Manager add-ins, get it. But if you just need a simple tool to quickly add columns of numbers,

calculate loan repayments, figure depreciation, and perform 120 other statistical and financial functions, this spreadsheet package is a great alternative. And it charts like the Beatles, too. ⌚ 6 min. 💰 \$19.95, 30-day free trial. vtsclc25.zip, 1.2MB, www.softseek.com

Idea Generator Brainstorming 101

Productivity isn't all about simply using tools—it's just as often about applying skills. Therefore a roundup on productivity tools wouldn't be complete without a skill-building ele-

ment. Brainstorming 101, free to nonprofit and government agencies, is a virtual workshop providing 3 to 6 hours of training in generating and applying good ideas. ⌚ 7 min. 💰 \$15, 30-day free trial for individuals. i4e-14-95.exe, 1.4MB, www.brainstorming.org

Best Free Software Sites

Creativity Unleashed MediaBuilder

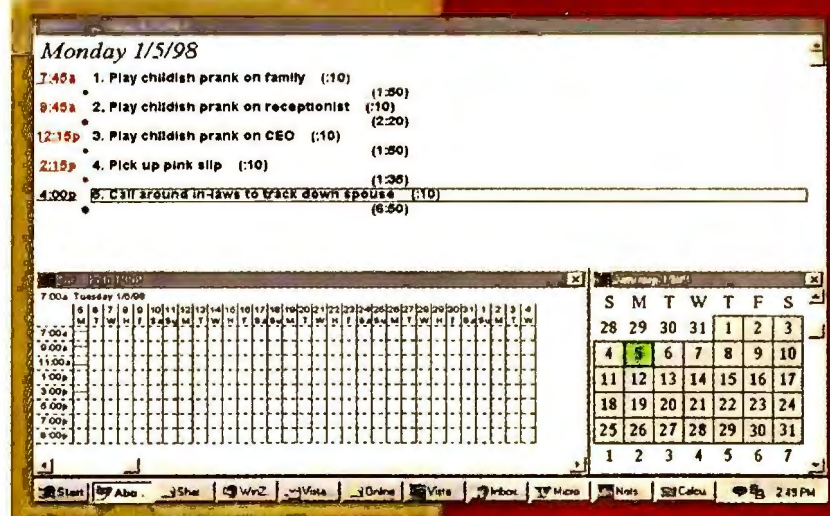
Anyone who uses a PC for designing multimedia shows, presentations, or Web sites should bookmark MediaBuilder. It offers a frequently updated library of free tools—HTML authoring packages, sound editors, and a lot more—plus a large collection of public-domain graphics. A nifty animated-banner creator lets you instantly apply more than 20 special effects to any text block. www.mediabuilder.com

Outstanding in Its Field Tucows

The bovine-sounding name stands for "The Ultimate Collection of Winsock Software," but this site has grown into a bulging megacollection of shareware, freeware, and demo

versions of Internet and network tools and accessories, multimedia creation and player software, and Windows 95 utilities, ►

ABOVE & BEYOND 98 is a powerful PIM that keeps schedules, contacts, and to-dos.



plus a smattering of games. The pithy reviews and ratings (five cows is a winner) help you separate the sirloin from the ground chuck. www.tucows.com

Personalize Your Office

Microsoft Office Free Stuff

Whether you love or hate Microsoft Office, you may be among the millions of folks who spend most of their business days using it. And even if you can't love Office unreservedly, you'll like the bevy of regularly updated add-ons at this site: extra wizards, import filters, and file viewers, as well as Office 97 Service Release 1, a free update that fixes bugs and adds a few new features. www.microsoft.com/officefreestuff

Site for Polite Software

Nonags

Nonags boasts an impressive library of shareware, freeware, and demoware in just about every imaginable category. So what makes this site special? As the name says, none of the packages here are hobbled by time bombs, reminders to register, disabled features, or the other tricks that vendors typically use to limit the usefulness of trial software. www.nonags.com

Best Free Browser Plug-Ins

Make Your PC Sound Great

RealPlayer 5.0

Forget your browser's bundled RealAudio player. RealNetworks' latest plug-in handles more than just streaming Web radio programming. In addition to FM-sound RealAudio, RealPlayer handles two types of streaming media—RealVideo programs and RealFlash animation. ⌚ 6.5 min. [r32up50.exe](http://www.real.com/products/player), 1.33MB, www.real.com/products/player

Radio Free Web

RealAudio Tuner

Okay, so now you've got RealPlayer plugged into your browser. RealAudio Tuner lets you tune in sites that broadcast RealAudio radio, and you can program up to ten radio

stations from around the world as preset buttons. ⌚ 4 min. ratuner.zip, 810KB, www.dragontek.com/ratuner

Cheap Phone Service

PhoneFree 2.0

PhoneFree may turn your PC into a \$2000 telephone, but you can't knock the hourly rate. Big Bits Software won't charge you for using the Internet to chat up other users of PhoneFree, as well as Netscape's CoolTalk and VocalTec's Internet Phone. And use PhoneFree to leave voice-mail messages in e-mail boxes. All you need are a mike, a sound card, and speakers. ⌚ 4 min. 377KB, phonefree.com/phone.exe

Beat This

Beatnik 1.1.7

Pick an audio format—any audio format. AIFF, MOD, AU, MIDI, and good ol' WAV—and odds are Beatnik can handle it. But this plug-in is really designed to play HeadSpace's own RMF—a tiny MIDI-size format that handles the high-quality waveform samples online composers love. ⌚ 16 min. beatnik-plugin-1-1-7.exe, 1.9MB, www.headspace.com

Prepare to Be Shocked

Shockwave Plug-In 6.0

Macromedia's development tools produce highly interactive Web page animations with good sound. Even better, these compact packages load quickly on dial-up lines. To play games and simulations at Shockwave sites—or to use their dynamic user interfaces—get this latest version of

the plug-in. It handles both regular Shockwave and Macromedia's new Flash apps that power streaming animation and graphics as well as interactive banners and maps. ⌚ 4.5 min. 939KB, www.macromedia.com/shockwave/download



REALPLAYER 5.0, a must-have browser plug-in, gives you real-time sound and video.

Un-Plugged

Plugsy 1.00.06

Encountering mysterious browser crashes because of plug-in conflicts? Give this Netscape Navigator plug-in a try. Plugsy lets you mix and match your various third-party and Netscape multimedia plug-ins and helper apps. With all of them working in organized harmony, you can avoid the resource clashes that cause browser crashes. ⌚ 16 min. Ⓢ \$29.95, 30-day free trial. pl32e107.exe, 610KB, www.digigarni.com

Best Free Web Services

Electronic Soapbox, Part 1

GeoCities

Got something to say? GeoCities will give you a free Web site (up to 3MB of space) to speak your mind in one of over 25 themed "communities," including Entertainment, Government, and Science. Setting up your site is a little tricky, but this is one of the Web's best free offers. GeoCities makes its money by populating its free sites with ads. www.geocities.com

Electronic Soapbox, Part 2

Tripod

Tripod's free Web site service is similar to GeoCities', but it's a more inviting habitat for first-time Web creators. While Tripod gives you less space (2MB versus GeoCities' 3MB), it provides a friendlier lineup of authoring tools, including one that lets you construct a basic site without ►



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knowing HTML. Like GeoCities, Tripod puts ads on your pages. www.tripod.com

Chatter Away for Free

ParaChat

Okay, so you've created your Web site. Now what? Spiff it up with a free chat room. ParaChat lets you add chat to any site—no special software required. True, your room will sport banner ads and won't be big on options, but it's still a great deal. ParaChat also offers ad-free and more feature-rich chat services starting at a thrifty \$60 per year. www.parachat.com

Get Your Site Noticed

Register-It

Once you have your Web site looking good, you'll want the world to know about it. For some quick publicity, stop by Register-It. The free service registers your site with 16 search engines and directories, including HotBot, Infoseek, and WebCrawler. For other search sites, you'll need to either register with those sites yourself or opt for Register-It's \$39.99 service, which covers 100 engines and directories. www.register-it.com

Best Places to Find Drivers

Where the Drivers Are

Shareware95

This is the place to start the great driver hunt. You won't actually get any drivers at Shareware95; instead, you will find links to just about any vendor's Web site, and you can download the driver you want from there. For good measure, Shareware95 throws in contact information for each company's tech support. www.shareware95.com/drivers

Drivers Ed

Frank Condon's World O' Windows

Someone, thankfully, is actually keeping track of the latest available drivers. It's not a pretty site, but at Frank Condon's World O' Windows you can look up a vendor and find out which drivers are available and what their function is, with links for downloading the files needed. Each page is dated, so you can tell whether you're reading the most current information. www.conitech.com/windows



Just Where Are My Drivers?

Drivers HeadQuarters

A better-looking site than Frank Condon's, Drivers HeadQuarters isn't kept nearly as up-to-date (or at least wasn't when we last visited it). So what's it got that World O' Windows lacks? Drivers Detective. This free, easy-to-use utility can tell you exactly what drivers you've got installed. www.drivershq.com

Back Door to Microsoft

Microsoft Software Library Directory

Want to see which bug fixes and updates are available for Word 97, or any other Microsoft product? Don't click your way through the Web site—go directly to the source: Microsoft's FTP server. Follow the link to 'index.txt' for a list of all files, with descriptions. You'll find the files by clicking the MSLFILES/ link. ftp.microsoft.com/softlib

Best Graphics and Sound Tools

Choosy Mothers Choose GIF

GIF Construction Set

If your Web site is just too static-looking, an animated GIF or two may be in order. These little moving pictures are easy to construct using the step-by-step wizard in this offbeat Alchemy Mindworks shareware. And all other aspects of GIF creation

are also handled with ease—including conversion from AVI to animated GIF, transparency, and text effects. ⌚ 7 min. Ⓢ \$20, 30-day free trial. gifcon32.exe, 1.39MB, www.mindworkshop.com/alchemy/alchemy.html

Show Me the Monet

WebMuseum

Want a Degas on your desktop or a Hopper on your home page? Hundreds of paintings and drawings have been digitized at the WebMuseum. This downloadable fine art, grouped by artist, covers all those original masters you've seen Sister Wendy rave about on PBS. When the Webmaster calls himself a curator, you know you're in for a highbrow treat. sunsite.unc.edu/wm/

Hard Disk Café

CD Copy

Sometimes you have the best sound track for your presentation on a few CDs—but you can't keep switching discs for your sound cues and do your presentation at the same time. For those occasions, CD Copy's ability to save audio disc tracks as .wav, .raw, or MPEG files is just what the spin doctor ordered. ⌚ 2 min. cdcopy.zip, 373KB, members.aol.com/mbarth2193/cdcopy.zip

Hep Tunes From Beatniks

The Beatnik Showcase

Install the Beatnik plug-in (see "Best Free Browser Plug-Ins"), and you'll find no end of professional mood music and sound effects. Here in the Beatnik Showcase, HeadSpace shows off what cool composers across the Web have done with the company's music-editing software—▶

DRIVE ON: Shareware95 is a good place to start looking for Windows driver updates.



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and it's wildly impressive. You can download music clips or just audition them at the site. www.headspace.com/beatnik/

Sound Studio

Cool Edit 96

If you've got a series of so-so sound effects and music clips, spice them up with Cool Edit 96. Its effects studio includes echo, flange, reverb, stretch, pitch change, and more. Unless you register the shareware, you're limited to two effects per editing session—but that's still enough to Hendrix up a flat WAV collection. ⌚ 4 min. c96setup.exe, 2MB, syntrillium.com/pub/cool_edit

Best Free Financial Information

Advice That's On the Money

Quicken.com

Intuit's well-rounded personal finance site isn't just for Quicken users. Even if you never balance your checkbook, you'll still find lots to like here, including interactive

planners that take some of the pain out of estimating taxes, retirement planning, and other basic money matters. The site also offers articles that are chock-full of sensible advice, as well as current quotes on the best rates for bank accounts, CDs, and loans. www.quicken.com

A Wealth of Fund Facts

Morningstar

Don't even think of investing in a mutual fund without consulting the experts at Morningstar, the company that set the standard for fund research. This mother lode of free fund data provides detailed reports on thousands of funds, plus price quotes, columns, and discussion forums for exchanging tips with fellow investors. Neophytes will particularly appreciate the plain-English glossary of fund terms. www.morningstar.net



COOL EDIT 96 lets you put pizzazz in your sound and music clips by adding special effects and seeing the results on screen.

The Fastest Free Quotes

Thomson Real-Time Quotes

Every financial site serves up free time-delayed stock quotes. But Thomson Real-Time Quotes has up-to-the-second prices for 50 stocks that you choose. The setup is archaic (faxing or mailing a signed ►

The Bargain Bin Better Deals Online

THE WEB may be bursting at the seams with great free stuff, but it's also the world's biggest shopping mall. You can now conveniently buy from many of your favorite retailers over the Web—and save money and get online-only bonuses in the bargain.

For instance, buy books online from Barnes and Noble (www.barnesandnoble.com), and the company will slash at least 30 percent from most hardcover list prices and 20 percent from paperback prices. By contrast, its retail stores discount non-bestseller hardcovers by only 10 percent and charge full list price for most paperbacks. (Bear in mind you'll pay shipping charges for online purchases, so your overall savings are reduced.)

Most established Web retailers don't match Barnes and Noble's sweeping discount policy, but other bargains can be found online. Tower Records (www.towerrecords.com), for example, gives you one free music CD with every five purchased at the regular price from its @Tower site—and many of its discs are

discounted only on the Web.

Some vendors provide e-mail services that alert you to special offers. Lands' End (www.landsend.com) has online-only sales on its clothing, luggage, and home furnishings. A site called Consumer World (www.consumerworld.org) does a good job of hunting down the lat-

est discounts and deals on general merchandise.

Air travel is a particularly fertile field for online bargain hunters. For instance, United Airlines (www.ual.com/traveler) gives users up to 1000 extra frequent-flyer miles per round-trip for booking on the Web. Another program called ClickRewards (ClickRewards.yahoo.com) offers you free miles on American Airlines, Delta, and a number of other car-

riers when you make purchases at Macys.com and other sites.

Many companies offer free product samples to visitors of their Web sites. At Absolutely Bananas (www.idealists.com/bananas), you'll find links to more than 30 categories of such offers and to other free-stuff sites available for browsing.

Not all free goodies are available directly on the Web. If you are willing to dial a toll-free telephone number, you can get an amazing variety of samples by mail, such as food, books, and baby products. For instance, Pumpkins 800/888 Phone Freebies (www.webspawner.com/users/PumpkinHead) lists over 2000 offers neatly organized by category, with a no-strings-attached definition of "free": None of them come with such strings attached as shipping and handling charges. —H. M.





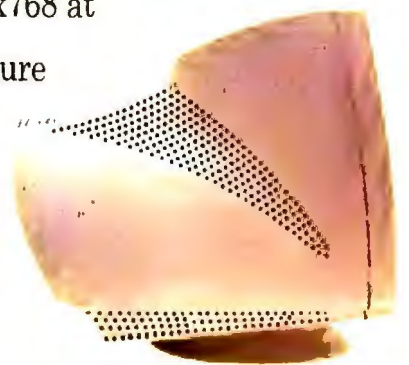
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EO710	17"	15.95"	0.26mm - High Contrast	1280	120Hz
EO720	17"	15.95"	0.26mm - MicroFilter™	1280	120Hz
EO90	19"	18.0"	0.26mm - High Contrast	1600	150Hz

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form to get access), but serious investors will be very glad they did. www.thomsonrtq.com

A Slicker Ticker

My Yahoo Ticker

"Push" software has a reputation—often richly deserved—for wasting bandwidth, disk space, and your time. But this push-based utility is mean, lean, and truly useful. It simply displays an ad-free, unobtrusive scrolling news ticker (financial alerts, your own stock quotes, and general news) in a window anywhere on screen. ⌚ 1 min. 310KB, my.yahoo.co/ticker.html

Best Free Government Sites

The United Search Engine of America

FedWorld

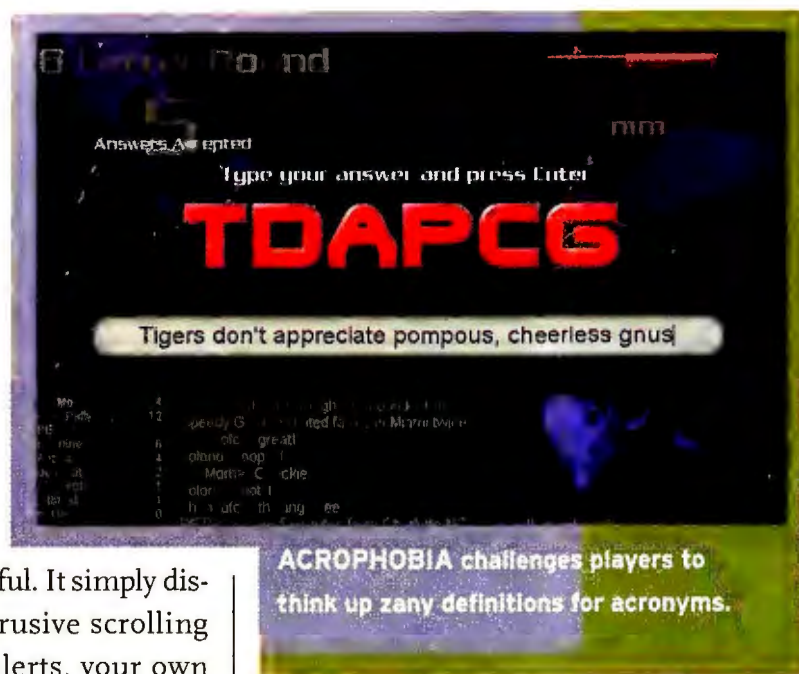
Need a tax form? Wonder what hours the Smithsonian Institution is open? If it has to do with the federal government, this specialized search engine can probably help you track it down. But take note: While there's plenty of valuable no-cost information here, some links lead to order forms for old-fashioned paper documents that *aren't* free. www.fedworld.gov

Small Business Starter Kit

Small Business Administration Online

Start a small business, and you can count on free advice from relatives—especially Uncle Sam, who gives plenty of help at this site. Despite SBA Online's dowdy plain-text pages, it offers a huge amount

of material on financing, writing business plans, and other essentials, along with a shareware library of over 500 programs to help you finance, market, manage, and otherwise run your own small business. www.sbaonline.sba.gov



Scamproof Yourself

ConsumerLine

Be careful out there: Read up on new scam artist hustles and how to avoid them. At this site, run by the Federal Trade Commission's Bureau of Consumer Protection, you'll find dozens of news bulletins on common frauds, plus an electronic edition of the invaluable *Consumer Resource Handbook*. www.ftc.gov/bcp/conline/conline.htm

Best Ways to Personalize Your PC

Desktop Decorator

Desktop Themes Heaven

It's time to decorate your Windows 95 or NT desktop. And whether your tastes run to sports superstars, great art, natural wonders, or cult movies, here you'll find a theme for you. Though the site's TV-style user interface is more clever than functional, it provides access to volumes of wallpaper images, sound clips, and icons, ranging from *I Love Lucy* to Grand Canyon themes. theme.simplenet.com

Foiled! Cursors Again!

154 Cursors

You don't have to see the same arrows and hourglasses as everyone else, and this collection of 154 animated cursors is as good as it gets. Many classics are included, such as the self-peeling banana, running dinosaurs, rolling eyes, and impatiently drumming fingers. It's just one of dozens of cursor compilations available at PC World Online. ⌚ <1 min. 154anis.zip, 136KB, www.pcworld.com/software_lib/data/articles/desktop/4334.html

What Color Is Your Wallpaper?

Randomizer

With Randomizer loaded, you'll never know what wallpaper will appear on your screen. That's because this simple DOS program, added to your StartUp folder, copies a random .bmp file into your wallpaper each time Windows loads. ⌚ <1 min. randomize.zip, 12.6KB, www.gumby.org

Best Free Gaming Sites

Whacked-Out Wordplay

Acrophobia

Quick, what does WCR stand for? Wax Candy's Revolting? Wombats Can't Rollerblade? With Acrophobia, the answer could be something even weirder. Berkeley Systems, the nutcases behind You Don't Know Jack, challenges you to devise off-beat definitions for acronyms. It's funny, thought provoking, and sociable: You compete with other players across the Web, chatting and voting on each others' responses. www.acrophobia.com

Free Plays Forever

Virtual Arcade

Don't bring a pocketful of quarters to this arcade—everything's free. Because it links to dozens of game sites that use technologies such as Java and Shockwave, you play right inside your browser—no special software required. Come here for simple-minded but addictive diversions, including a boxing match that lets you face off against Bill Gates, Martha Stewart, and other celebrities. www.virtualarcade.com

Top Dog Among Game Sites

Happy Puppy

This canine-themed gamers' haven is a purebred through and through. It offers a gold mine of playable game demos, shareware, and freeware—everything from Quake II to Pac-Man clones. You'll also find necessities such as decompression programs and DirectX drivers, plus refreshingly outspoken reviews, features, and interviews. www.happypuppy.com

Harry McCracken is senior writer at PC World, Lincoln Spector is contributing editor at PC World, and Matt Lake is a Pennsylvania-based freelance writer. ■



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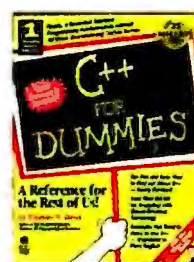
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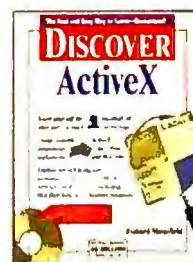
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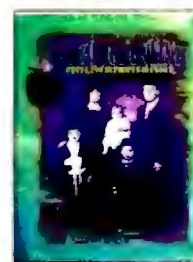
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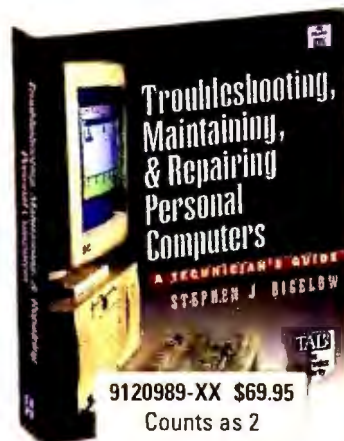
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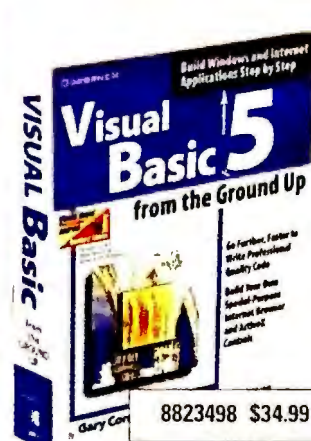
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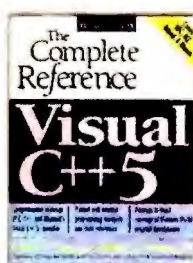
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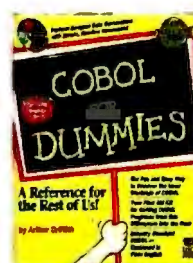
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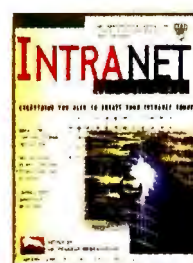
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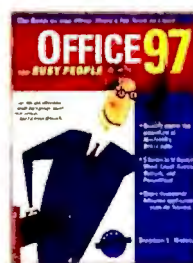
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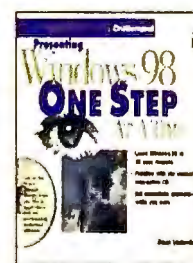
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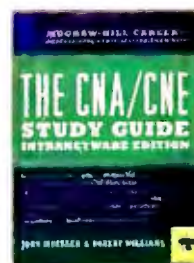
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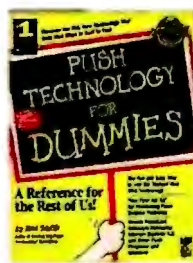
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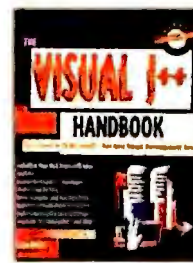
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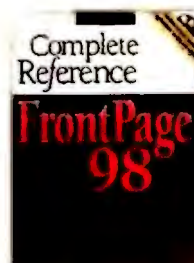
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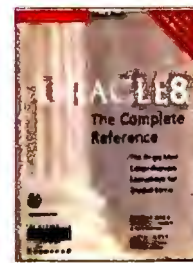
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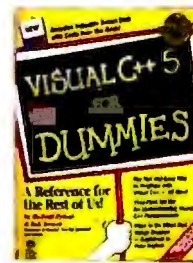
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Counts as 2



5878283 \$24.99

Need to get your PC fixed? Steer clear of the top national chains—all four fumbled on our undercover tests, and many tried to peddle costly, unneeded parts or services.

People have been grouching

about how much it costs to fix their PCs since the first Altair rolled out of a storefront in Albuquerque, New Mexico, more than 20 years ago. Misleading estimates, rude and occasionally dishonest technicians, and big repair bills seem to be alarmingly typical these days. But are the horror stories just isolated cases?

To find out, *PC World* conducted a detailed investigation of service

slogans: "You Have Questions, We Have Answers," trumpets RadioShack. "World Class Customer Service," boasts Computer City. The others are similarly self-assured. Do they live up to their billing? The answer affects a lot of you: These four chains are the biggest companies that repair a wide range of major-brand PCs. Each of them has a strong national presence, repairs computers not purchased in its own stores, and advertises

PC REPAIR

By Charles Piller

stores. Posing as unsophisticated customers, *PC World* reporters in six cities tested 20 branches of four giant computer chains. After reading this article, you'll never view computer service the same way again.

Best Buy, CompUSA, Computer City, and RadioShack all have bold

widely. In short, each represents a primary choice for most consumers. According to the trade magazine *Computer Retail Week*, these chains collectively account for more than one-third of the \$29 billion earned last year by the top 100 computer retailers. ►

**BEST
BUY**

SERVICE IS OUR PRIORITY
SERVICE INVOICE

**RADIO
SHACK**

estimated the cost of your
repair will be \$95.00 in
labor and \$625.00 in parts

**COMPU
SERVICE CENTER**

COMPUTER

CALIFORNIA

COMPUTER

HDD on the unit has failed and is no longer

In Control
Pur. Date
10/1/96

Estimate

LEADER ERROR WILL NOT BOOT
SBD AND HDD WITH CMQ SUPPLIE

Rip-Off!

And the big four provided a far greater percentage of repair services because many of the top retailers are direct-mail companies (such as Micro Warehouse) or discount houses (such as Costco) that do not repair the machines they sell.

That turns out to be bad news for consumers. Take RadioShack. In our tests, it properly fixed only two PCs in five tries; one store took 25 days to complete work and even then didn't detect the source of the problem. Because RadioShack offers no phone support—for free or fee—perhaps it should change its slogan to the more apt “Don't Ask, Don't Tell.”

Unfortunately, RadioShack's dismal performance was far from unique. Stores from every chain wanted to sell us a new hard drive or motherboard (or both) to fix a problem caused by a faulty \$7 cable. The common urge to prescribe costly, unneeded parts suggests that naive consumers pay dearly at thousands of stores across the country every day. And few ever re-

alize that they are wasting their money.

Service isn't much good unless your computer gets fixed. But the fix itself is only part of good service. We evaluated five stores from each major chain based on a combination of the key factors in the consumer experience—accuracy, quality, cost, efficiency, and helpfulness.

Easy Problems? Not for These Stores

WE CREATED THREE equipment problems (for details, see “Service Test: Defining Our Approach”). The first, to test phone tech support, was a corrupted video driver that degraded on-screen color. The next problem required reporters to bring PCs into the shop. Each identically configured PC had either a bad hard drive cable or a bad CD-ROM cable—easy problems to diagnose and cheap to fix. Our third problem was a misplaced SIMM, which slowed the system to a crawl.

Our findings suggest that a service visit to any of the giant chains is not for the faint of heart (for an overview, see “Rampant Incompetence: Every Chain Falls Flat”; for details, see “Weakness Everywhere: How Service Broke Down”):

“The entire process was an exercise to be **good intentions.**”

■ Of 55 problems tested across 20 stores, a total of 30 were misdiagnosed, ignored, or went otherwise unfixed. Best Buy and Computer City each missed on 9 of 15 tries. Given 10 problems to solve, RadioShack missed 6. CompUSA missed on 6 of 15 problems.

■ Only two stores fixed all three problems: the CompUSA superstores in Santa Clara, California, and Woburn, Massachusetts. And even they were not perfect. The Woburn store lost points for inefficiency and lack of helpfulness, and the Santa Clara outlet fell short for suggesting a time-wasting fix for the phone problem.

■ Seven of 15 stores did not meet a minimum level of acceptable service for the phone test (RadioShack doesn't offer phone tech support). Only 3 of 5 Best Buy and 3 of 5 CompUSA stores passed—and one pass in each case was marginal. Only 2 of 5 Computer City stores passed.

Service Test

Defining Our Approach

PC WORLD doesn't often go undercover. But that was the only way to find out how consumers were really being treated by the big chains' repair services. Here's how we did it: First we purchased 20 identically configured, refurbished Compaq Pre-

sario 4122 PCs—using one for each of five stores at each of the four chains. (Compaq was not consulted on our test planning or in the development of this article; this make and model was chosen merely because of its near-universal acceptance by repair shops nationwide.)

Before setting up our test prob-

lems, we verified that each system was in perfect working order. We reformatted each hard drive, then reinstalled Windows 95, along with several applications and dummy files.

How We Tested

POSING AS typical consumers, we presented the following tests to the stores:

Problem 1. To test phone support, we sabotaged each PC's display by renaming the video driver. A good tech should be able to diagnose the problem over the phone and guide a user to a solution: reinstalling the driver.

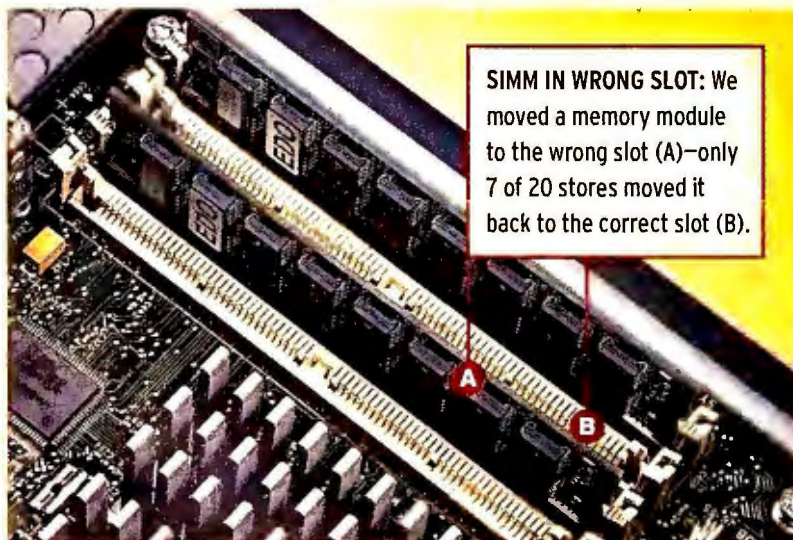
Problem 2. On 15 of the 20 systems, we damaged the IDE hard drive cable by cutting several of its internal wires. The damage was not visible, but the

system wouldn't boot. Correct solution: Replace the IDE cable. On the remaining 5 systems we disabled the CD-ROM audio by cutting the sound cable. Correct solution: Replace the cut cable.

Problem 3. We moved one SIMM in each machine to an incorrect slot, reducing usable system memory from 16MB to 8MB. We didn't tell the technicians that the memory seemed faulty. The PCs ran so slowly, and the wrong order of the SIMMs was so easy to see, we believe a trained person should readily spot this problem.

How We Graded

WE EVALUATED STORES by measuring key factors in the consumer experience, assigning points according to relative



■ Ten of 20 stores did not meet a minimum level of acceptable service for the bad cable; no chain solved the problem in more than three of five tries.

■ Thirteen of 20 stores failed to detect the misplaced SIMM; only CompUSA solved the problem three times; Computer City and Best Buy failed in four of five tries.

■ Nine of 20 stores—3 RadioShack outlets and 2 stores from each of the other

chains—either replaced or tried to replace parts that were in perfect working order.

■ On cost, Best Buy was best, with charges as low as \$20; CompUSA stayed under \$100 but charged a minimum of \$90. RadioShack and Computer City wanted to bill up to \$720 and \$605, respectively, for parts and labor we didn't need.

Precious Few Highlights












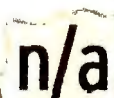
NOT ALL THE NEWS was bad. At least one store in every chain performed reasonably well, and in a few cases we had dream

experiences—effective repairs punctuated by courtesy, efficiency, and low cost on in-store service. (Even top performers didn't match that record for phone support, however.) CompUSA boasted one standout with its Santa Clara superstore. "They fixed the faulty hard drive cable faster than they said they would," our reporter commented. "Didn't even charge for the cable, and got the SIMM problem right."

In Westminster, Colorado, Best Buy offered superb service for a disabled CD-ROM audio cable. "When I brought it in (with a crying baby, for realism)," our reporter says, "a tech checked all the settings to make sure it wasn't just a software ►

Rampant Incompetence: Every Chain Falls Flat

PC World created hardware and software problems for the four leading national PC chains, testing five stores per chain. The overall performance—for both in-store service and telephone support—was largely abysmal.

SERVICE PROBLEMS: Faulty cable and misplaced SIMM				PHONE SUPPORT PROBLEM: Corrupted video driver	
CHAIN		Overall rating	Behind the grades	Overall rating	Behind the grades
	Second-biggest computer retailer; 285 superstores, \$2.77 billion annual hardware sales.		Lived up to its name on cost, very helpful, but diagnoses and repairs were unreliable. One store tried to sell unneeded hard drive, another replaced system board without permission. Four out of five stores failed to detect the misplaced SIMM.		Two stores aced this question, one passed marginally, and the other two failed.
	Top computer retailer; 153 superstores, \$3.25 billion annual hardware sales.		Helpful and courteous, but diagnoses unreliable. Three stores fixed cable problem, but two tried to sell an unneeded system board or hard drive.		Only one store scored well; two charged us without solving the problem.
	Subsidiary of Tandy; 96 superstores, \$1.48 billion annual hardware sales.		Diagnoses were unreliable. Two stores tried to sell an unneeded system board or RAM. Four out of five stores failed to detect the misplaced SIMM.		One store advised trashing the graphics card driver, making matters worse; only two stores passed the test.
	Owned by Tandy; 5000 stores take in machines for repair; \$322 million annual hardware sales.		Only two successful cable repairs and two successful SIMM fixes. Three stores tried to sell an unneeded system board, hard drive, or antivirus software. Average time in shop: 14 days.		No phone support, so consumers can't troubleshoot a problem without a visit to the shop.

n/a = not applicable

SOURCES: Sales figures from *Computer Retail Week*. Store figures from each chain.

importance. The best possible score was 100 points.

■ **Accuracy** (20 points maximum in store, 55 phone). Did the store diagnose the problem correctly and without confusion? If so, it scored big; in the few cases where a store got close enough to identifying a problem without clearly defining it, we gave partial credit.

■ **Quality** (30 points, in store only). Did the store fix the prob-

lem? This is the acid test of repair experiences, of course. Without a fix, no store was graded above F. We penalized stores that tried to sell unneeded parts or services.

■ **Cost** (20 points). Was the final bill fair and consistent with estimates? If so, we gave high marks; overcharges were penalized.

■ **Efficiency** (15 points). Did the store meet its own completion estimates? If so, we graded it high,

even if the PC spent a long time in the shop. But if a store wasted our time with sluggish repairs, communication breakdowns, or long waits on hold, it lost points.

■ **Helpfulness** (10 points). Were employees instructive and courteous? If so, we gave them their due. Stores with terse, uncommunicative, impatient, or rude techs were marked down.

■ **Misplaced SIMM** (5 points, in

store only). Did the store spot the problem and fix it?

We gave each store an overall grade based on these criteria, then averaged grades for the five stores within each chain to get a single letter grade as follows:

A = 90 to 100 points

B = 80 to 89 points

C = 70 to 79 points

D = 60 to 69 points

F = less than 60 points

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- Altec Lansing ACS-90 Speakers
- Iomega Zip 100MB Internal Drive
- MS Office 97 Small Business Edition Plus Bookshelf 98; McAfee VirusScan
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- MS IntelliMouse

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Business Lease^o: \$102/Mo., 36 Mos.
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- STB nVidia 4MB 3D AGP Video Card
- 32X Max[^] Variable CD-ROM Drive
- MS Office 97 Small Business Edition Plus Bookshelf 98; McAfee VirusScan
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problem. They charged the minimum diagnostic service fee—\$19.99—and threw the cable in for free.”

In phone support tests, Best Buy and Computer City were uneven when it came to helpfulness, but all except one CompUSA store treated our reporters

with complete courtesy and patience. And several stores from these three chains were easily accessible by telephone. What did the best stores do right? First, they listened carefully. Then they seemed to take a methodical approach and didn’t jump to conclusions, ruling

out obvious possibilities first, and then moving efficiently to the next steps.





Phone Support: A Cautionary Tale

UNFORTUNATELY for consumers, in the real world the right answer counts more than accessibility and kindness—and for





Weakness Everywhere: How Service Broke Down

A few stores did well, but the best that can be said for the four chains is that they performed inconsistently on nearly every aspect of service. Don’t trust any store that you haven’t verified as competent based on the experience of independent sources.

SERVICE PROBLEMS: Faulty cable and misplaced SIMM

CHAIN	Accuracy of diagnosis	Quality of repair	Cost	Efficiency	Helpfulness
	Inconsistent: Three of five stores fixed the cable, and one fixed the SIMM.	Inconsistent: Two stores made repairs without incident. Two stores wanted to replace a motherboard or hard drive. Another tried to peddle an unnecessary backup service.	Least expensive: \$19.99 to \$95. But one store billed Compaq for unneeded motherboard and improperly charged us for labor.	Inconsistent: Average turnaround about 3 days—but that included botched diagnoses. Our beefs: time wasted holding on phone, one repair that took 15 days.	Very good: Staff at all five stores were courteous, helpful, and patient.
	Inconsistent: Three of five stores fixed cable, and three fixed the SIMM.	Inconsistent: Two stores made repairs without incident. Another fixed the system after we brought it back a second time. Two others tried to replace a hard drive or motherboard.	High minimum: \$89.97 to \$99.97. One store wanted to bill Compaq for an unneeded motherboard and hard drive.	Inconsistent: Average turnaround about six days—but that included botched diagnoses. Our beefs: missed deadlines, phone delays.	Good: Most staff were courteous, helpful, and patient.
	Inconsistent: Three of five stores fixed cable, one fixed SIMM.	Inconsistent: Two stores repaired PCs without incident. Two tried to replace a motherboard or sell unneeded RAM.	Wide range: \$30 to \$605. One store wanted to bill us for a new motherboard.	Consistently poor: Averaged ten days per machine. Our beefs: missed deadlines, phone delays.	Mediocre: Techs were generally courteous and helpful but not always well informed.
	Substandard: Two of five stores fixed cable, and two fixed the SIMM.	Worst performer: Two stores repaired our PCs after lots of trouble. Three tried to replace the hard drive or motherboard.	Wide range: \$39 to \$720. One store wanted to bill us for a new motherboard.	Worst performer: Averaged 14 days per machine. Our beefs: slow service, poor communications.	Poor: Techs courteous, but frequently ignorant about store policies and repair status.

PHONE SUPPORT PROBLEM: Corrupted video driver

CHAIN	Accuracy of diagnosis/guidance	Cost	Efficiency	Helpfulness
	Toss-up: Two stores nailed it, a third came up with a marginal fix, and two failed.	Can’t beat it: No charge for support at any store.	Inconsistent: Techs at three stores were fast and responsive, but with the other stores, we had trouble getting through or waited on hold.	Inconsistent: Techs at two stores were courteous, one store pushed us off to Compaq, and two had impatient and terse staff.
	Tails—you lose: One store nailed it, two offered a marginal fix, and two failed but charged us anyway.	Pricey: \$24.97 flat rate or \$2.49 per minute.	Inconsistent: Three stores were fast, but two kept us waiting on hold too long.	Good: With one exception, techs were courteous and patient.
	Tails—you lose: One store nailed it, one offered a marginal fix, two failed, and one left us worse off than when we started.	Lots of freebies: One store charged \$2.49 per minute; the others didn’t charge, but two stores needlessly urged us to bring the systems in for service.	Consistently good: Prompt attention, minimal waits on hold.	Inconsistent: Two stores were very good, while techs at two others showed impatience and reluctance to help.
	No phone support.	Not applicable.	Not applicable.	Not applicable.

phone support, right answers were hardly the norm. Only three stores—CompUSA's Woburn outlet, and the Best Buy stores in Westminster, Colorado, and West Covina, California—gave us outstanding service, pinpointing the problem with our driver and promptly explaining how to reinstall it. More routinely, we encountered techs who either came up with a time-consuming fix (reinstalling all software from the Compaq QuickRestore CD, which overwrites all data on the hard drive) or were simply stumped.

CompUSA's \$24.97 phone support charge may not seem onerous, except when you consider that only three of the chain's five stores solved our problem—and two of those used the marginally acceptable QuickRestore fix. The two other chains, on the whole, were generous with their time. While Best Buy does not officially offer or charge for phone service, its techs still provided phone support when asked. But their advice failed in three of five cases. Computer City advertises a standard charge of \$2.49 per minute for phone support, but four of five stores didn't charge us. Unfortunately, a sweet deal turned sour in three cases, when suggestions from the chain's techs didn't help at all. The Denver outlet made matters worse, advising our reporter to delete an undamaged video driver. RadioShack's lack of phone support means that the chain offers no way for consumers to screen a problem: A simple software glitch could send your computer to the shop for a lengthy and costly stay.

In the Shop: Litany of Errors

IF YOU USE a trusted mechanic for your car, a breakdown may still be expensive and frustrating, but at least you can be confident you're getting a fair deal. If you take your computer to one of these four chain's stores, you'll often find techs who seem to have no idea what they are doing—and they do it very slowly.

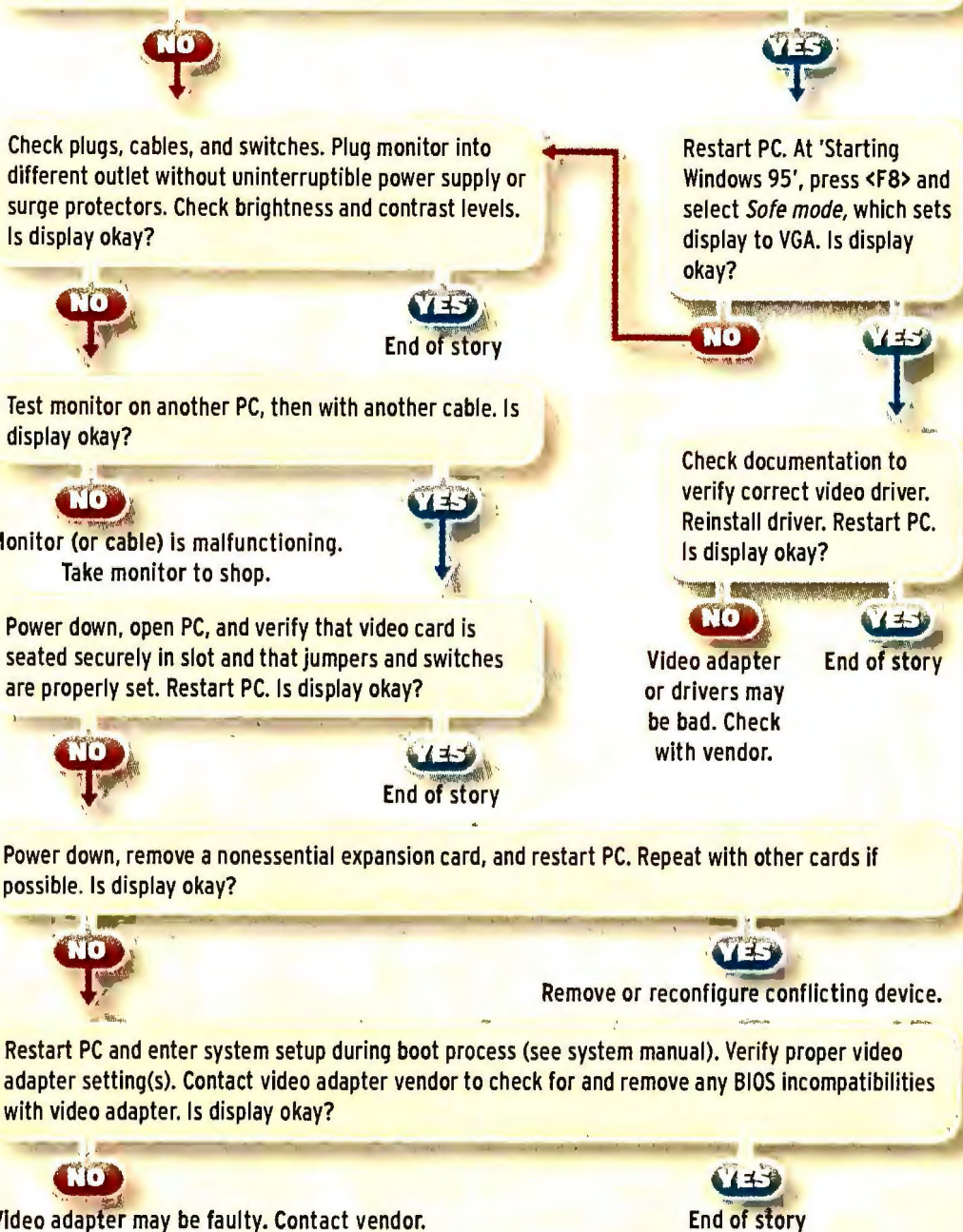
Overall, RadioShack was the least effective chain—generally inefficient and unhelpful, it failed to fix our cable problem three times out of five. Not a single RadioShack store fixed both the cable and the SIMM problems. Two RadioShack stores eked out C ratings—the others flunked. Computer City scored only a bit better:

BE YOUR OWN TROUBLESHOOTER

Bad Display

Don't like what you see on-screen? If you use Windows 95, try these procedures before making a trip to the shop.

Restart PC. If 'Starting Windows 95' appears during boot process, press <F8> and select *Command prompt only*. Is display okay?



Three stores passed marginally; only one of those fixed both the bad cable and the misplaced SIMM.

CompUSA and Best Buy bettered this record slightly: Nearly all their stores got strong marks for helpfulness, and two stores from each chain performed well on many aspects of the consumer experience. But the rest performed terribly: Only two CompUSA stores fixed both problems; none of the Best Buy shops did so.

"We'll Have to Get Back to You..."

CAN YOU IMAGINE being without your computer for days? How about weeks? If you go to one of these chains for service, consider taking home a rental PC. Only three stores diagnosed and completed

work within 48 hours—the Best Buys in Denver and Westminster, and the Computer City in Pleasanton, California. Six other stores took longer, though they met or improved on their estimated completion dates. But among those nine "efficient" stores, only five actually fixed our cable problem correctly, and only a single store caught the misplaced SIMM.

Average repair times ranged from about 3 days for Best Buy, to 6 days for CompUSA and 10 days for Computer City. RadioShack averaged more than 14 days per machine. This was primarily due to the chain's cumbersome system of transporting all machines dropped off at local stores to centralized service centers for repair. RadioShack executives have ►

"I'm certainly **not happy** with any report that says customers are **getting less** than they deserve."

—NATHAN MORTON, CEO, **COMPUTER CITY**

acknowledged this weak spot. (In fairness, the faster chains' stores sometimes suggested that we replace working parts. Had we elected to follow this bad advice, the repair process would have taken longer.)

Diagnostic Ineptitude

WHEN WE BROUGHT PCs to a shop, we described our faulty cable symptoms—no audio on CD-ROMs, or a 'Drive not found' message for the hard drive cable. The techs took it from there. Unfortunately, none of the chains was able to figure out the faulty cable problem without considerable aggravation in more than two cases out of five.

Worse, when a store botched the cable problem diagnosis, it never ended up fixing it. Our reporter's experience at the CompUSA store in Framingham, Massachusetts, was alarmingly typical: "Over the telephone, the technician said he'd seen my disk controller failure 'a million times a day' and it meant I needed to replace the hard drive. I really had to wrestle with him to accept the machine for a hands-on diagnosis." When the tech finally relented and agreed to diagnose the problem in the shop, he proceeded to recommend a new motherboard.



That part-replacement mentality quickly became familiar. None of the chains offer commissions that might encourage replacement of serviceable parts, but stores in every chain—three RadioShacks and two from each of the others—►

Don't Get Taken



TROUBLED PCs remind us of the movie *Twister*: The problem is evident, but you often have no idea where it's coming from or what your best escape route is. When error messages start pelting your monitor, grab this checklist before you run to the nearest repair facility.

Think Ahead

BEFORE you find a repair store:

- Try online help. For common problems, check newsgroups such as alt.comp.hardware, .pc-homebuilt and comp.sys.ibm.pc.hardware.
- Call your credit card company. Some automatically extend warranties for products bought with their card.

Before the Repair

BASED ON our experience, you may fare better at local stores not connected to large chains. Ask friends for tips, and find out how long the recommended stores have been in business. You can check many stores through the Better Business Bureau; (www.bbb.org/bureaus).

A Checklist for PC Repairs

Ask the store if it will give you an estimate for diagnosis and repair. Also, before you go:

- Put a name-and-address label on your PC and monitor.
- Back up your data.
- Know your system's purchase date and its warranties.
- Record the serial numbers of major components.

During the Repair

IF YOU'RE confused, consider bringing a technically savvy friend with you to the repair facility. At the store:

- Read all the fine print.
- Get written estimates.
- Arrange to get your original components back unless they are needed for a trade-in.
- Insist on authorizing every proposed repair, rather than giving the store a blanket okay.

After the Repair


ONCE a store has cured your system, use these guidelines:

- Pay by credit card. The credit card company may intervene if disputes arise later.
- Get a signed list of what repairs were done.
- Check your PC's system memory and the component serial numbers to be sure you're not getting short-changed.
- Keep all receipts.

If the worst happens, and you think you've been ripped off:

- First ask the department and store managers to make it right.
- Seek help from your local Better Business Bureau.
- Complain to the local district attorney or the state attorney general (www.consumerworld.org/pages/agencies.htm).

—Laurianne McLaughlin



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tried to convince us to replace parts that were in perfect working order. This could merely have been incompetence. It may also have been deliberate efforts to sell unneeded components or services.

Peddling Unneeded Parts

A TECHNICIAN at the RadioShack in San Francisco tried to sell our reporter both a new hard drive (instead of just a new cable) and an antivirus software package, claiming that the machine was infected with the NYB virus. The suggestion was puzzling, given that the store could not get the system to recognize the drive, and therefore could not have scanned the drive to determine that a virus was present. (We scanned all PCs before bringing them to the stores, and just to be sure, we scanned that "infected" drive after we fixed the system ourselves. It was free of viruses.)

Although our reporter left strict orders with the Best Buy store in Willow Grove, Pennsylvania, not to replace any part without permission, the techs went ahead and

installed a new motherboard anyway. "On the plus side, they replaced my old motherboard and its 150-MHz Pentium CPU with one using a 166-MHz Pentium," our reporter noted. "The entire process was an exercise in incompetence mixed with what appeared to be good intentions."

After the tech at Best Buy's West Covina, California, store recommended a new hard drive, our reporter did everything he could think of—short of confessing knowledge of the precise solution—to help the store succeed. "How about trying the drive in another system?" our reporter helpfully suggested. The technician's reply: "I didn't hear the hard drive make any noise, you know, like it was working. So it's a goner." He insisted that a new drive would make things as good as new—without mentioning that all data would be lost.

The most perplexing of these cases took place at the RadioShack in Carlsbad, California. The store diagnosed hard disk failure and claimed to have replaced the

drive—again, without our permission. When we checked the machine, the old hard drive was still there.

"Our records indicate that a hard drive was sent to Compaq in exchange for the new one," said Bob Kilinski, vice president for service at Tandy, RadioShack's parent corporation. "If the wrong drive was inadvertently sent, Compaq's system is not designed to make that distinction." Kilinski then added, "Such a widespread system [as RadioShack] can experience an individual problem...we always do our best to correct it."

That episode reflected the generally chaotic communications we found at RadioShack. In one case, the service center claimed to have transferred our PC back to the store where we left it, but the store didn't have it. The machine resurfaced a week later.

Fast and Loose With Warranties?

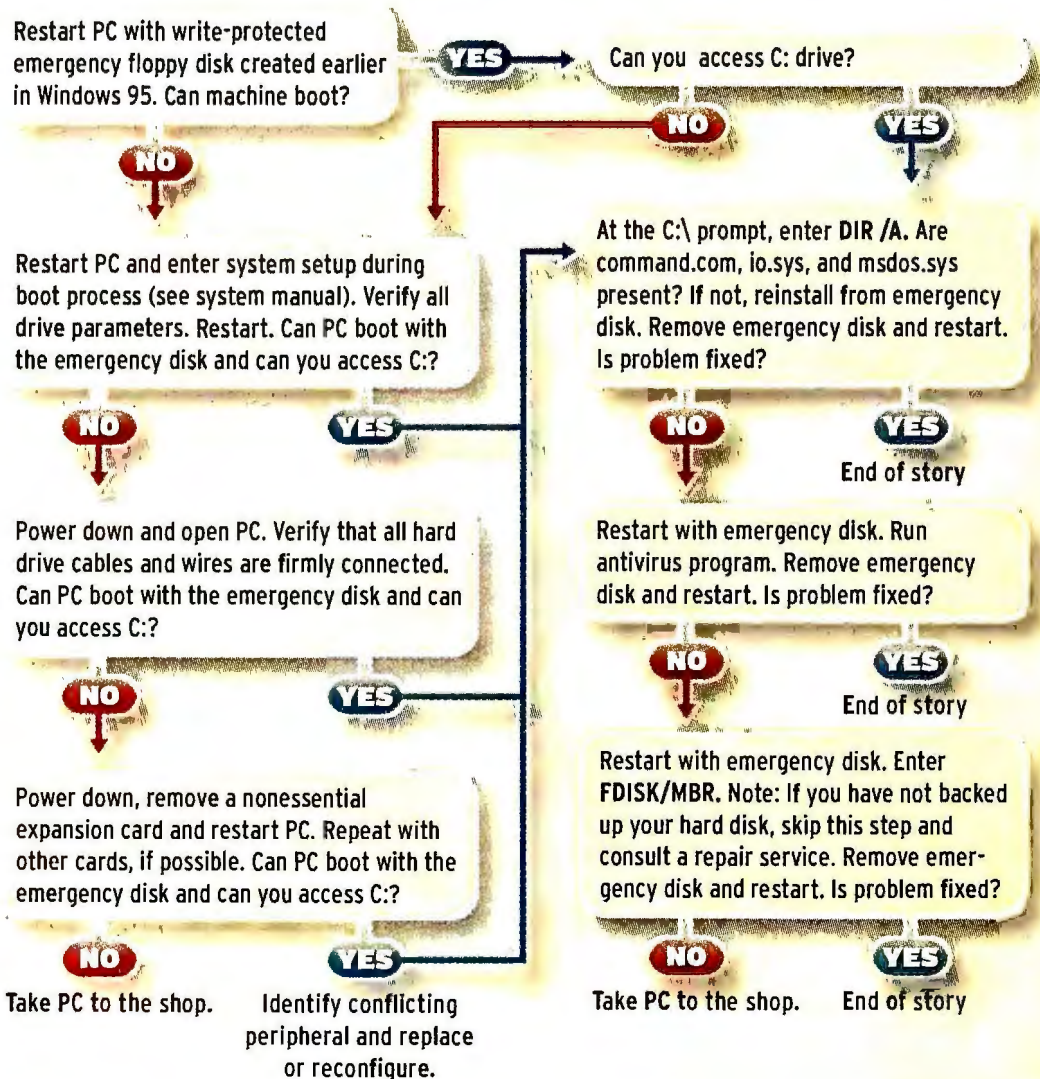
ASIDE FROM what appears to be at best an inaccurate claim to have replaced a hard drive, there is another curious aspect to the Carlsbad RadioShack case. It involves warranty repairs. The Compaq PCs used in our investigation were in fact still under warranty. Our reporters, however, identified the machines as being out of warranty, posing as worried consumers who expected to spend their own cash. To our surprise, several stores took the initiative to check directly with Compaq, and learned that the machines were indeed covered. (We authorized only one repair under warranty, although two other stores replaced parts under warranty without our permission. *PC World* reimbursed Compaq for all warranty expenses the company incurred as a result of this story.)

On the surface, a store's investigating warranty status looks like great service. But each time we encountered this apparently beneficial service, the store urged us to replace perfectly functional parts. You might shrug and think, "If it happened to me, why not go for it?" But a new hard drive means you lose your data. In all three of the cases where parts were replaced under warranty, we were charged for labor, even though the warranty covers labor. And in the long run, manufacturers pass along costs associated with warranty abuse by jacking up PC prices. ►

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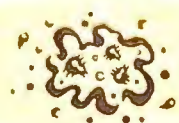
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Danger Signs

OVERALL, OUR MANY disappointing experiences at the service stores seemed to share certain characteristics:

■ **Rush to judgment.** Many of the stores' technicians made a firm—and incorrect—diagnosis before checking the problem thoroughly. Our reporters had to stand in long lines in many stores; pressure to move machines rapidly through the queue could partly explain the haste.

■ **Carelessness.** Lapses in store oversight let bad assessments go forward unchallenged. (According to the Better Business Bureau, computer retail stores rank 7th worst among 327 types of businesses on number of overall complaints; however, the Bureau's data do not distinguish between sales and service problems.)

■ **Inefficiency.** Some stores use disorganized or sluggish systems for moving and tracking products and communicating with customers.

Response From the Top

PC WORLD ASKED all four chains how they account for their lackluster showing. Best Buy declined to comment, but executives from other chains seemed chastened.

"I'm certainly not happy with any report that says customers are getting less than they deserve," said Nathan Morton, chief

"Obviously, we're disappointed. It's very disturbing. I've already addressed [PC World's findings] with our people," said Tandy/RadioShack's Kilinski. "On the surface, it looks like someone made an assumption about a product based on past experience rather than checking carefully." But, he added, "we take customers seriously, and we take service seriously."

In defense of their stores, all the executives said that internal customer surveys indicate most people are happy with the service they receive. None of the chains

would have caught the cable problems during the installation process. Our experience suggests otherwise. In one case—at the Computer City store in Pleasanton, California—we permitted the replacement parts to be installed. At the Best Buy store in Willow Grove, Pennsylvania, parts were replaced without our permission; and the Carlsbad RadioShack claimed (wrongly) to have made a replacement—again unauthorized. In no case was a misdiagnosis detected in the process.

Why did we have so many bad experi-



"I don't challenge **the results.** I'm obviously **not very pleased.**" —PAUL POYFAIR, EXECUTIVE

VICE PRESIDENT FOR SERVICES, **COMPUSA**

executive officer of Computer City, a Tandy subsidiary that may soon be spun off as a separate company. "But it's a very high priority for us to get it right."

"I don't challenge the results," said Paul Poyfair, CompUSA's executive vice president for services. "I'm obviously not very pleased." He then said, "We have 1500 techs across the country, and we've typically fared very well, but it's something that keeps [vice president for technical services] Rick Fountain and myself up at night." Poyfair added, "You can be assured that this will be something we focus on."

would release the survey data to PC World.

The executives also argued that you can't expect flawless performance—PCs are very complex, and sometimes problems can't be reproduced in the shop, said Computer City's Morton. "But that's not to excuse anything. We want to be right 100 percent of the time."

CompUSA's Poyfair and RadioShack's Kilinski argued that their stores would have caught diagnostic errors if our reporters had, for example, permitted the techs to replace a hard drive or system board. They predicted that technicians

ences? Is the problem mostly one of shoddy management and inept or careless technicians—or is there a training gap?

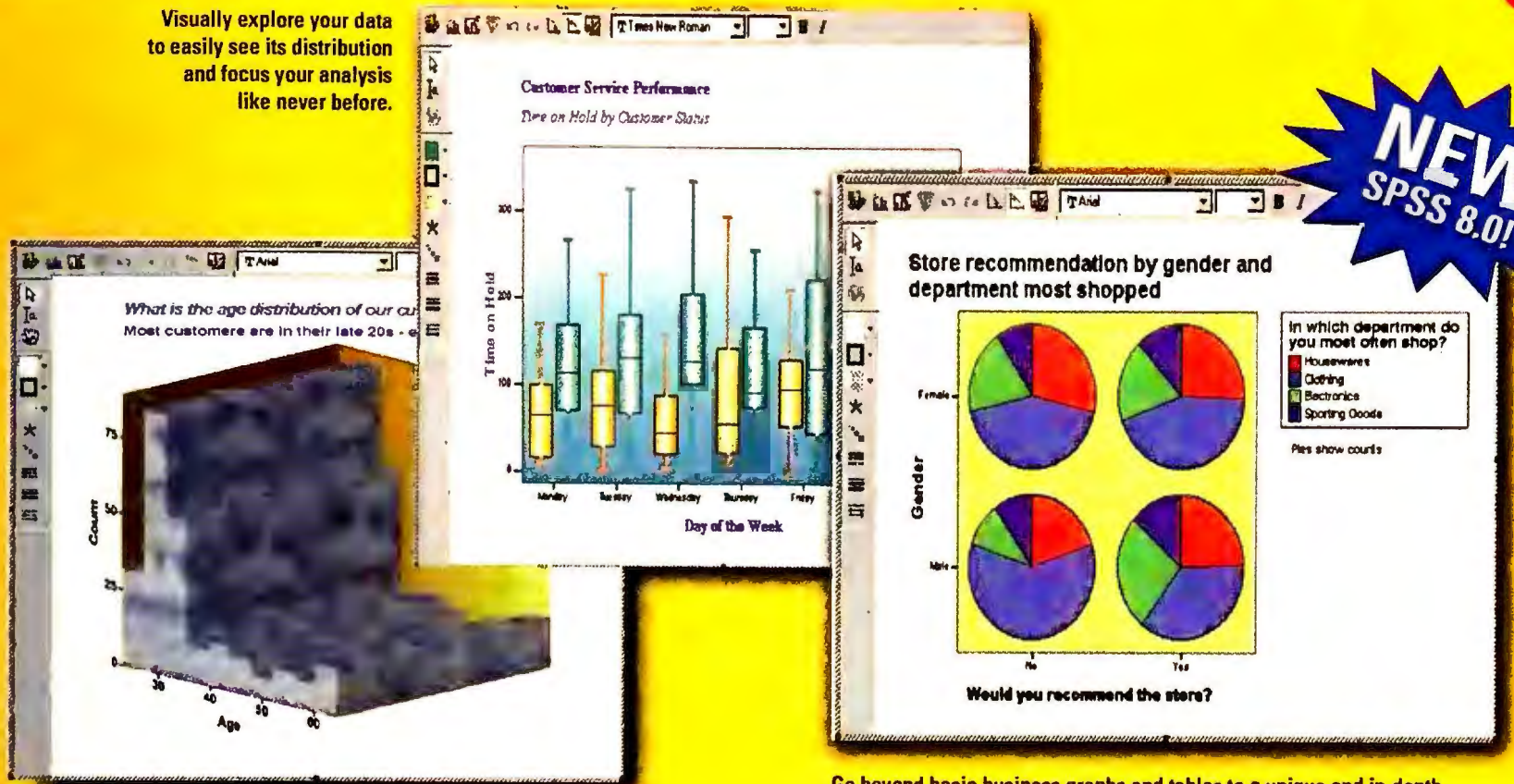
Root Cause: Training Lapse?

ALL THE CHAINS SAY that training is a top priority, and they all use training programs administered by computer vendors. Computer City rewards technicians with higher pay if they get extra training, says Morton. Every CompUSA store employs a "master technician" as a troubleshooter. And all four chains require their technicians (sometimes after in-store training) to obtain A+ certification, administered by the Computer Technology Industry Association (CompTIA) and widely accepted as a baseline standard for diagnosis-and-repair techs.

PC World learned from CompTIA, however, that of the 20 stores we tested, only 8 had more than half their techs certified A+; no Computer City and only one ►

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Best Buy repair facility had achieved this status. (CompTIA says that in some cases, A+-certified shops are not registered with them.) In any case, the distinction proved an unreliable indicator of skill. The average grades for the A+-certified stores were a D+ for our phone test, and a D for our in-shop test—barely better than the stores without overall A+ certification.

After encountering so many major errors, we naturally asked chain executives about their efforts to improve quality. Computer City is automating a system for gathering data on customer experience and for marshalling a response to problems. CompUSA says it will soon reward tech managers who score high on customer satisfaction surveys. "From time to time we will screw up, but we're trying to do everything we can to keep that to a minimum," CompUSA's Poyfair said. In light of *PC World's* findings, RadioShack may require a second tech to verify the need for expensive repairs.

Pay Your Money, Take Your Chances

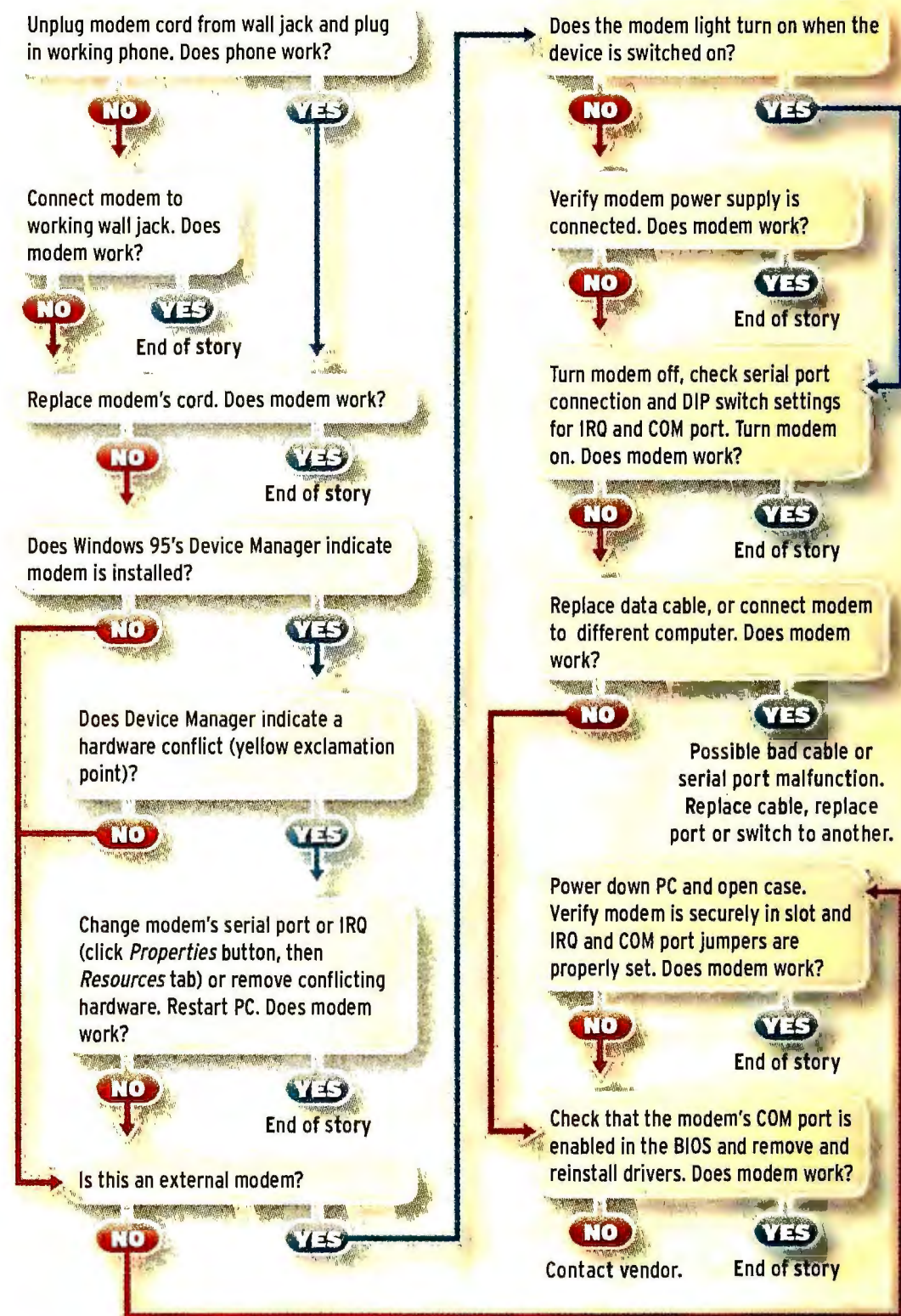
UNTIL THE CHAINS improve, are you stuck with taking a repair gamble? Yes and no. *PC World* did not test regional chains like Fry's Electronics (California) or Micro Center (eight states), or office-supply chains such as Staples and Office Depot, because none of them repair systems that weren't purchased at their stores. And we didn't try local mom-and-pop stores, whose dependence on referrals can make good service a life-or-death proposition. Anecdotal reports suggest that small, community-based businesses of any kind tend to be more responsive to customers than are large national chains. (Tellingly, one RadioShack technician actually suggested to a reporter that he'd be better off going to a mom-and-pop for repairs.)

But whichever service provider you choose, our experience suggests that a little homework can spare you major headaches and needless expense. When you buy a computer, look for one with a long warranty. Then get smarter about which problems really need fixing, and learn some troubleshooting skills. (For a head start, see the "Be Your Own Troubleshooter" charts.) When you need help, solicit referrals from friends and colleagues, and try your PC manufacturer's technical

BE YOUR OWN TROUBLESHOOTER

Modem on Blink

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support line. You can also screen services through the Better Business Bureau. (For more tips on how to avoid exasperating and costly repair experiences, see "Don't Get Taken: Checklist for PC Repairs.")

Of course, no single person will ever experience the barrage of frustrations met by our team of reporters. But consider this: At RadioShack, we faced less than a fifty-fifty chance of getting a problem corrected at a fair price, and the odds were barely better at the other chains. So unless you've gotten positive feedback about a specific store or checked its record, steer

clear of the big four computer retailers. Our investigation suggests that if you must get a machine repaired, depending on the big chains is risky business.

Charles Piller is executive news editor and Laurianne McLaughlin is a senior associate news editor at PC World. Additional reporting by Dean Andrews, Denny Arar, Steve Bass, Michael Desmond, Reid Goldsborough, Mike Hogan, Jane Morrissey, Randy Ross, Bill Snyder, and Scott Spanbauer. Test development by Jeff Kuta of the PC World Test Center.

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Micron	
Acer	Fair
Toshiba	
Digital	Poor
Packard Bell	

Windows Magazine, 8/97

WOULD YOU BUY AGAIN?

VENDOR	% WHO WOULD BUY THE SAME BRAND
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Quantex	91%
IBM	89%
Micron	81%
Gateway	80%
Acer	74%
Digital	69%
Toshiba	61%
Compaq	58%
Packard Bell	51%

Windows Magazine, 8/97



Windows Magazine
4 WINLIST Awards
Sep '97 - Mar '98



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Lab Runner-up Award
QP5/233 SM-3 (12/97)

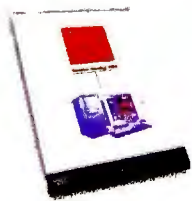


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- 32X Max EIDE CD-ROM Drive
- Quantex ATX Mid Tower Case
- 104-Key Keyboard with MS IntelliMouse
- MS Windows NT 4.0 Workstation
- MS Office '97 Small Business Edition
- 3-year limited warranty with 1-year On-Site Service**
- 24-hr./7-day Technical Support
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QP6/333 SB-3 (w/ Pentium® II Processor).....\$2149

QP6/333 SB-4 **\$2399**

(featuring Pentium® II processor)

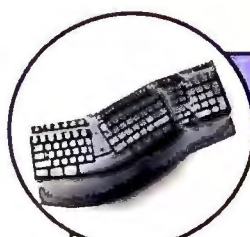
Business lease: \$84/Mo.

- 333MHz Pentium® II Processor
- 2 Universal Serial Bus (USB) Ports / DMI 2.0
- 64MB SDRAM Memory / 512KB Secondary Cache
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- 8.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
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QP6/266 SB-4 (w/ Pentium® II Processor).....\$2149
QP6/300 SB-4 (w/ Pentium® II Processor).....\$2299

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Small Business Edition includes: Word 97 • Excel 97 • Outlook 97 • Publisher 97 • Small Business Financial Manager 97 • Automap Streets Plus



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Value Multimedia Series

Software: Corel Office Suite B • MS Money '97 • Compton's Interactive Encyclopedia • Body Works 6.0 • Amazon Trail II
American Heritage Talking Dictionary • Internet the City • Compton's Reference Collection • Dr. Solomons Find-Virus • MS Internet Explorer 4.0

QP5/233 M-1 **\$1199**

(with MMX™ Technology)

Lease: \$42/Mo.

- 233MHz Pentium™ Processor with MMX™ Technology
- 32MB EDD Memory / 512KB Pipelined Burst Cache
- 3.2GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- STB Nitro 3D w/4MB SGRAM
- 15" Digital Monitor (13.8" viewable)
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- 32X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-90 Speakers
- Dantex Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows '95 with MS Plus!
- Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service**

QP6/233 M-1X(with Pentium II processor), \$1399

QP6/266 M-1X(with Pentium II processor), \$1499

QP6/333 M-2x **\$1999**

(featuring Pentium™ II processor)

Lease: \$70/Mo.

- 333MHz Pentium™ II Processor
- 32MB SDRAM Memory / 512KB Secondary Cache
- 4.3GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 64-bit 3D AGP Graphics Card with 4MB SGRAM
- 17" Digital Monitor (15.8" viewable)
- 100MB Internal Zip Drive w/one cartridge
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- 32X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-90 Speakers
- Dantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows '95 with MS Plus!
- Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service**

QP6/233 M-2X(with Pentium II processor), \$1699

QP6/266 M-2X(with Pentium II processor), \$1799

QP6/300 M-2X(with Pentium II processor), \$1949

QP6/266 M-3x **\$1849**

(featuring Pentium™ II processor)

Lease: 65/Mo.

- 266MHz Pentium™ II Processor
- 64MB SDRAM Memory / 512KB Secondary Cache
- 6.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 64-bit 3D AGP Graphics Card with 4MB SGRAM
- 17" Digital Monitor (15.8" viewable)
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- 32X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-90 Speakers
- Dantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows '95 with MS Plus!
- Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service**

QP6/233 M-3X(with Pentium II processor), \$1749

QP6/300 M-3X(with Pentium II processor), \$1999

QP6/333 M-3X(with Pentium II processor), \$2049

QP6/333 M-4x **\$2299**

(featuring Pentium™ II processor)

Lease: 81/Mo.

- 333MHz Pentium™ II Processor
- 64MB SDRAM Memory / 512KB Secondary Cache
- 6.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 3D Labs Permedia 2 AGP Graphics Card with 8MB
- 19" Digital Monitor (18.1" viewable)
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- 32X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-90 Speakers
- Dantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows '95 with MS Plus!
- Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service**

QP6/233 M-4X(with Pentium II processor), \$1999

QP6/266 M-4X(with Pentium II processor), \$2099

QP6/300 M-4X(with Pentium II processor), \$2249

Power Multimedia Series

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• Project Manager Pro • Labels Unlimited • Compton's Reference Collection • Dr. Solomons Find-Virus • MS Internet Explorer 4.0

QP5/233 SM-1 **\$1299**

(with MMX™ Technology)

Lease: \$46/Mo.

- 233MHz Pentium™ Processor with MMX™ Technology
- 32MB EDD Memory / 512KB Pipelined Burst Cache
- 4.3GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- STB Nitro 3D w/4MB SGRAM
- 15" Digital Monitor (13.8" viewable)
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- 32X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-90 Speakers
- Dantex Mid Tower Case
- 104-Key Keyboard with MS IntelliMouse
- MS Windows '95 with MS Plus!
- Power Multimedia Software Bundle
- Microsoft Office '97 Small Business Edition
- 3-year limited warranty with 1-year On-Site Service**

QP6/233 SM-1X(with Pentium II processor), \$1499

QP6/266 SM-1X(with Pentium II processor), \$1599

QP6/233 SM-2x **\$1749**

(featuring Pentium™ II processor)

Lease: \$57/Mo.

- 233MHz Pentium™ II Processor
- 32MB SDRAM Memory / 512KB Secondary Cache
- 4.3GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 128-bit Riva 128 3D AGP Graphics Card with 4MB SGRAM
- 17" Digital Monitor (15.8" viewable)
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- 32X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-45 Speakers with subwoofer
- Dantex ATX Mid Tower Case
- 104-Key Keyboard with MS IntelliMouse
- MS Windows '95 with MS Plus!
- Power Multimedia Software Bundle
- Microsoft Office '97 Small Business Edition
- 3-year limited warranty with 1-year On-Site Service**

QP6/266 SM-2X(with Pentium II processor), \$1849

QP6/300 SM-2X(with Pentium II processor), \$1999

QP6/333 SM-2X(with Pentium II processor), \$2049

QP6/266 SM-3x **\$1999**

(featuring Pentium™ II processor)

Lease: \$70/Mo.

- 266MHz Pentium™ II Processor
- 64MB SDRAM Memory / 512KB Secondary Cache
- 6.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 128-bit Riva 128 3D AGP Graphics Card with 4MB SGRAM
- 17" Digital Monitor (15.8" viewable)
- 100MB Internal Zip Drive w/one cartridge
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- 32X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-45 Speakers with subwoofer
- Dantex ATX Mid Tower Case
- 104-Key Keyboard with MS IntelliMouse
- MS Windows '95 with MS Plus!
- Power Multimedia Software Bundle
- Microsoft Office '97 Small Business Edition
- 3-year limited warranty with 1-year On-Site Service**

QP6/233 SM-3X(with Pentium II processor), \$1899

QP6/300 SM-3X(with Pentium II processor), \$2149

QP6/333 SM-3X(with Pentium II processor), \$2249

QP6/333 SM-4x **\$2499**

(featuring Pentium™ II processor)

Lease: \$88/Mo.

- 333MHz Pentium™ II Processor
- 64MB SDRAM Memory / 512KB Secondary Cache
- 6.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 3D Labs Permedia 2 AGP Graphics Card with 8MB
- 19" Digital Monitor (18.1" viewable)
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- 32X Max EIDE CD-ROM Drive
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-90 Speakers with ACS-250 subwoofer
- Dantex ATX Mid Tower Case
- 104-Key Keyboard with MS IntelliMouse
- MS Windows '95 with MS Plus!
- Power Multimedia Software Bundle
- Microsoft Office '97 Small Business Edition
- 3-year limited warranty with 1-year On-Site Service**

QP6/233 SM-4X(with Pentium II processor), \$2199

QP6/266 SM-4X(with Pentium II processor), \$2299

QP6/300 SM-4X(with Pentium II processor), \$2449

Best Buy Specials

M-Series Best Buy **\$1999**

(featuring Pentium™ II processor)

Lease: \$70/Mo.

- 333MHz Pentium™ II Processor
- 2 Universal Serial Bus (USB) Ports/ Intel 440LX PCI Chipset
- 32MB SDRAM Memory / 512KB Secondary Cache
- 4.3GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 64-bit 3D AGP Graphics Card w/4MB SGRAM
- 17" Digital Monitor (15.8" viewable)
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- Toshiba 2nd-Generation DVD-ROM Drive w/Decoder Board
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-90 Speakers
- Dantex ATX Mid Tower Case
- 104-Key Keyboard with MS Mouse
- MS Windows '95 with MS Plus!
- Value Multimedia Software Bundle
- 3-year limited warranty with 1-year On-Site Service**

SM-Series Best Buy **\$2499**

(featuring Pentium™ II processor)

Lease: \$88/Mo.

- 333MHz Pentium™ II Processor
- 2 Universal Serial Bus (USB) Ports/ Intel 440LX PCI Chipset
- 64MB SDRAM Memory / 512KB Secondary Cache
- 6.4GB Ultra ATA HD / 3.5" 1.44MB Floppy Drive
- 128-bit Riva 128 3D AGP Graphics Card with 4MB SGRAM
- 19" Digital Monitor (18.1" viewable)
- K56flex protocol Fax/Modem™ w/Voice Mail and Speakerphone
- Toshiba 2nd-Generation DVD-ROM Drive w/Decoder Board
- Ensoniq 32-Bit Wavetable Sound Card
- Altec-Lansing ACS-45 Speakers with subwoofer
- Dantex ATX Mid Tower Case
- 104-Key Keyboard with MS IntelliMouse
- MS Windows '95 with MS Plus!
- Power Multimedia Software Bundle
- Microsoft Office '97 Small Business Edition
- 3-year limited warranty with 1-year On-Site Service**

UPGRADES (available with system purchase)

- Panasonic PD/CD-Rom Drive w/ one 650MB PD cartridge.....\$ 249
- Three(3) Panasonic PD Cartridges\$ 99
- Zip 100MB Internal Drive w/ one cartridge.....\$ 79
- Microsoft Natural Keyboard Elite (upgrade from 104-Key Keyboard)....\$ 39
- HP Deskjet 692C Printer (w/photo color kit).....\$ 299
- HP Laserjet 6L Laser Printer.....\$ 379
- Microsoft® Sidewinder™ 3D Joystick.....\$ 59

(all upgrades covered by manufacturer's warranty)



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Painless

BY MICHAEL GOODWIN AND SAM HAMMOND

Web Pages

Need a basic home page?

Or a sophisticated **Web site?**

We've picked the **best tools**

to escape from HTM-hell.

UNTIL RECENTLY, if you wanted your own Web page you had two choices: You could learn to program in HTML (and Java, and Javascript, and Perl, and hey, a little C couldn't hurt), or you could come up with the bucks ►

I L L U S T R A T I O N S B Y P A M H O B B S

to hire a pro who had those skills already—and who charged accordingly.

Times do change. Not only are WYSIWYG Internet authoring tools easier to use than ever, but now they're everywhere—built into your word processor, included in your business suite, one mouse click away inside your browser. Drop in the graphics, drag them to where you want them, and format type and tables as if you were using a word processor. At least that's the theory.

But can you really use these tools to build a sophisticated, full-featured Web page? Or do you need to invest in a dedicated Web authoring product to get beyond the basics?

FREE OR PAY-TO-PLAY?

TO FIND OUT how far you can go with a built-in Web authoring tool—and when you might need to jump to a dedicated package—we put a handful of both types of products to work designing a Web page. We started with the built-in freebies, programs that you don't have to spend any extra money on since you're likely to have them on your desktop already—Microsoft FrontPage Express,

best buy



Low price and easy Web authoring—from simple to complicated—make **Microsoft's FrontPage 98** our Best Buy. Of the ten programs we tested, FrontPage

98 is among the few that could do every task we gave it—and the only one that could do them all well. In addition, its interface is as intuitive and easy to use as you're likely to find in so full-featured

a WYSIWYG editor. And though it doesn't quite rank as the cheapest Web authoring program we tested, its \$149 price is more than reasonable considering all the power you get.



the authoring tool incorporated in Microsoft Internet Explorer 4.0, and Netscape Composer 4.03, which comes as part of Netscape Communicator 4.04—and two word processors with built-in tools for creating Web pages: Lotus Word Pro 97 and Microsoft Word 97. The third suite word processor, WordPerfect (part of the \$479 Corel WordPerfect Suite), also includes a built-in Web authoring tool, but it's so poorly designed and buggy that we found it unusable. In fact, Corel di-

rects users instead to its Web.SiteBuilder 8.0 product, another program in Corel WordPerfect Suite.

As a result, we included Corel Web.SiteBuilder in our group of six pay-to-play products—specialized WYSIWYG authoring tools that are dedicated to building Web pages from the ground up. We also looked at Microsoft FrontPage 98 (\$149), SoftQuad HotMetal Pro 4.0 (\$129), and NetObjects Fusion 2.02 (\$295), as well as the final beta versions of Macromedia Dreamweaver Preview Release 2.0

Authoring Features: Products at Every Price

PACKAGES	List price	Minimum disk space (MB)	Ease of use	View frames in editor	WYSIWYG mail-in form in both browsers	Easy to access generated HTML code	External browser preview	Image editor	Java applet insertion
Adobe PageMill 3.0 800/411-8657 www.adobe.com	\$99	10	excellent	●	●	●	●	●	●
Corel Web.SiteBuilder 8.0 800/772-6735 www.corel.com	\$479 ¹	50	fair	●	●	●	●	○	●
Lotus Word Pro 97 800/343-5414 www.lotus.com/smartsuite	\$99	30	excellent	n/a	○	○	●	●	○
Macromedia Dreamweaver Preview Release 2.0 800/945-9076 www.macromedia.com/dreamweaver	\$499	20	good	●	●	●	●	○	●
Microsoft FrontPage 98 800/426-9400 www.microsoft.com/frontpage	\$149	36	excellent	●	●	●	●	●	●
Microsoft FrontPage Express 800/426-9400 www.microsoft.com	free	47	excellent	n/a	●	●	●	○	●
Microsoft Word 97 800/426-9400 www.microsoft.com	\$339 ²	46	excellent	n/a	●	●	●	●	○
NetObjects Fusion 2.02 888/449-6400 www.netobjects.com	\$295	20	excellent	●	●	○	●	○	●
Netscape Communicator 4.04 ³ 415/937-2555 home.netscape.com	free	18	excellent	n/a	n/a	●	●	○	○
SoftQuad HotMetal Pro 4.0 800/387-2777 www.softquad.com	\$129	40	good	○	●	●	●	●	●
Best Buy ● Yes ○ No									

n/a = not applicable ¹ Suite price; upgrade is \$249.

² Upgrade \$85.

³ Must download Composer as part of Communicator.

⁴ Requires included site-management tool.

FROM BEGINNER TASKS like an e-mail hyperlink to advanced add-ins like a Javascript pop-up box, our mock Web site—designed for a fictitious office supply business called SupplyOnDemand—has it all. Here we identify all the site elements that we used to test the Web authoring tools in this review. To view the site live, go to www.pcworld.com/april98/webauthor.

By the time we had built our sample Web site ten times over, we had a clear sense of just how well each application handled common tasks. (You can see the results—a Web page for an imaginary office supply business called SupplyOn-Demand that we built with our Best Buy product—by pointing your browser to www.pcworld.com/april98/webauthor.)

through our most difficult tasks. But only one—the amazingly low-priced FrontPage 98—rates a Best Buy.

DIFFERENT KINDS of Web page elements demand very different authoring skills—adding an image, for example, is much less complicated than incorporating scrolling text. So we designed our test page with three ascending levels of difficulty—Beginner, Intermediate, and Advanced—each with tasks that fit the skill for that level.

Retrieves pages from the Internet	Updates links
<input type="radio"/>	<input checked="" type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input checked="" type="radio"/>
<input checked="" type="radio"/>	<input checked="" type="radio"/>
<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/>	<input checked="" type="radio"/>



9. E-Mail Hyperlink By clicking on this hyperlink, visitors will be able to send you e-mail instantly.

It's always the little ones that
take on the world.



Introducing the HITACHI VISIONBOOK TRAVELER.

The famously diminutive Emperor didn't get where he got by letting grass grow under his feet. Legendary mobility, no doubt enhanced by his exceptional portability. A principle we've adapted to the new Hitachi VisionBook Traveler.™ It compresses vast computing power into the smallest practical



package. While being large enough to offer complete utility: A full-

page width color screen. Video output. A keyboard you can touch-type on. And runs Windows® 95. Slip in a modem card and you'll have access to the Internet and its oceans of information. You'll have the means to dispatch commands to every continent. And you get it all in a package not much bigger than a paperback, and weighing less than three pounds. Meaning no matter how far your ambition carries you, the Hitachi VisionBook Traveler is one thing you'll always insist on taking along.



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8.4" Page-width screen

High resolution color TFT

Runs MS Windows® 95

Touch-typeable keyboard

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SIGNIFICANT FEATURES

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- Runs Microsoft Windows® 95.
- 1GB hard drive, 3.5" external floppy drive.
- 24MB RAM, expandable to 40MB.
- Three PC card slots.
- Video out port with external resolution up to 1024 x 768.
- SoundBlaster® Pro audio and integrated speakers.
- Modem, memory, and other accessories available.



age your Web site efficiently. That includes publishing updated files to the server and updating links. So we rated how the programs handle these tasks too.

HOLD YOUR WYSIWYG HORSES

SCARY AS IT sounds, you may one day decide to tweak the HTML code that your program has created. Be forewarned: Most Web authoring tools put out messy code, with unneeded tags and instructions. That's not a problem as long as you don't muck with it, but if you want to get into the nitty-gritty of HTML, most of these editors won't be very helpful.

Also, not even the best of these Internet products can show you exactly how your page will work on the Web. Something that works fine in Internet Explorer (scrolling marquee text, for instance) doesn't always work the same way (or at all) in Navigator. That means you'll need to test your work as you go, with both browsers. So the easier your authoring software makes it to switch from one

to the other, the happier you'll be. FrontPage 98 and Dreamweaver both do a good job with this.

EASY AS WORD PROCESSING

CREATING A WEB PAGE in Word 97 is very much like using, well, Word 97. You type text, format it, import graphics,



plug and play java

Java applets are little executable files that add **cool things** (like clocks, calculators, or certain kinds of animation) to your Web site. Instead of creating these applets yourself by writing **Java code**, you can download ready-made applets off the Web. A **great resource** for Java applets is Gamelan at www.gamelan.com.

and create forms much as you would craft an annual report. The only difference is that when you're done you send it to a Web site, not a laser printer.

Editing a Web page is similar in FrontPage Express

and in Netscape Composer. But some of the more advanced Web authoring programs, like HotMetal Pro, employ so many floating toolbars and other on-screen controls that you get the impression you're looking at the instrument display in a fighter jet. Unfortunately, in many areas you're flying blind until you fire up a browser to see what your page actually looks like.

Another thing that sets more-advanced apps apart is their use of styles. The best of these products give you a jump start on building your page by providing a choice of *themes*—a set of consistent backgrounds and color schemes. When you add on to your site, you just customize that theme template. In the area of themes, FrontPage 98 and Fusion were standouts.

These two programs also provide cascading style sheets, a site management feature that allows you to change the style of all your pages simply by changing the theme in the site manager. Similarly, if you move a page, any links pointing to the old page will update automatically.

Authoring Tools: Up for the Task?

From basic pages to advanced sites with mail-in forms, Microsoft FrontPage 98 can satisfy almost all of your Web authoring needs.

PRODUCTS	BEGINNER PAGE					INTERMEDIATE PAGE		
	Create and format body text	Hyperlink text	Insert and format graphics	Insert graphic hyperlink	Insert e-mail hyperlink	Create image map	Insert background sound	Insert and format table
Adobe PageMill 3.0	excellent	excellent	excellent	excellent	good	excellent	●	excellent
Corel Web.SiteBuilder 8.0	excellent	poor	fair	poor	good	good	good	good
Lotus Word Pro 97	excellent	excellent	excellent	excellent	excellent	●	●	poor
Macromedia Dreamweaver Preview Release 2.0	excellent	excellent	good	excellent	good	excellent	good	excellent
Microsoft FrontPage 98	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent
Microsoft FrontPage Express	excellent	excellent	excellent	excellent	excellent	●	good	good
Microsoft Word 97	excellent	excellent	excellent	fair	excellent	●	good	excellent
NetObjects Fusion 2.02	excellent	excellent	excellent	excellent	excellent	excellent	excellent	excellent
Netscape Composer 4.03	excellent	excellent	excellent	excellent	good	●	●	excellent
SoftQuad HotMetal Pro 4.0	excellent	excellent	good	excellent	good	excellent	fair	fair
Best Buy								

n/a = not applicable ¹No site management tools. ²Doesn't show code at all. ³Documentation not made available for review. ⁴Available in NetObjects Fusion 3.0, shipping in late March.

BEGINNER PAGE

CREATING OUR BEGINNER page involved five basic operations:

- Inserting, placing, and formatting text.
- Creating hyperlinks to that text.
- Inserting and sizing graphics.
- Creating hyperlinks to the graphics.
- Inserting an e-mail hyperlink.

A BEGINNER PAGE generally includes a couple of headlines, a few blocks of text, background graphics, and some images—all connected by links. An e-mail link is pretty basic too: It's a text or graphic element that brings up a preaddressed mail-creation form when you click on it (see "Web Primer" for an example).

NICE TO YOUR WALLET

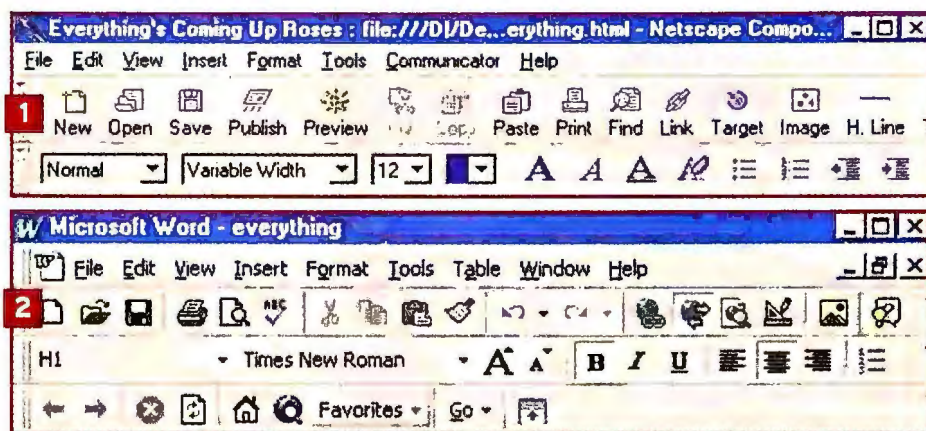
IF ALL YOU WANT is a beginner page, you're in luck: All our freebies—FrontPage Express, Netscape Composer, Word 97, and Word Pro 97—provide the tools you need to build one. And they make the process about as easy as creating a text

document. Typing in text and inserting images is a breeze. Adding links is as simple as double-clicking the text or image you want to make "hot" and browsing to the text or image you want to link it to.

There are some differences, though. FrontPage Express makes adding new e-mail links much easier, with a drop-down menu of available HTML tags, including 'mailto', which is the one you need for this task. Word 97 falls a bit behind in this area due to a bug that hampers the chore of resizing linked JPEG images—the image reverts to its original size once you create a link from it. FrontPage 98, Fusion, and Page-Mill build the Beginner page nicely—but you have to pay for them. Dreamweaver and HotMetal Pro fall short because they

don't have grab-and-pull image resizing.

Only one Web authoring tool, Corel WordPerfect Suite's Web.SiteBuilder, failed to make the Beginner grade. Although this product doesn't have serious



BUILDING PAGES in Netscape Composer

(1) and Microsoft Word 97 (2) results in practically the same thing: a basic page without extras like frames (3).

problems with these basic tasks, its underlying file and link management scheme (which doesn't let you use long file names and renames such elements arbitrarily) permeates virtually every feature, making it so difficult to use that it was pretty much knocked out of the running, even at this most basic level. ►

ADVANCED PAGE

OTHER

Create transparent graphics	Create and format input forms	Create automated Javascript	Dynamic HTML support	Insert Java applet	Create frames	Themes	Documentation	Site management	Update links	Publish to server	Clean code
good	excellent	●	●	excellent	good	●	excellent	good	excellent	good	good
●	excellent	●	excellent	fair	good	fair	good	fair	●	poor	fair
●	fair	●	●	●	●	●	excellent	n/a ¹	n/a ¹	good	● ²
●	excellent	excellent	●	fair	good	fair	n/a ³	excellent	excellent	excellent	excellent
excellent	excellent	good	excellent	good	excellent	excellent	good	excellent	excellent	excellent	good
●	poor	●	excellent	fair	●	●	good	n/a ¹	n/a ¹	good	fair
fair	excellent	●	excellent	●	●	●	good	n/a ¹	n/a ¹	good	fair
excellent	excellent	●	poor	excellent	excellent	excellent	good	excellent	excellent	excellent	● ²
●	●	● ⁴	●	●	●	●	good	n/a ¹	n/a ¹	good	fair
fair	good	poor	good	excellent	fair	fair	good	good	good	excellent	excellent

● = Unable to perform task.

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INTERMEDIATE PAGE

OUR INTERMEDIATE PAGE required four additional tasks:

- Creating an image map, which lets you assign unique links to different parts (or hot spots) of a single image.
- Adding background sound.
- Inserting tables.
- Creating transparencies, where one color in a graphic is transparent so the background shows through.

THIS IS WHERE our freebies fall by the wayside (see "Authoring Tools: Up for the Task?"). Word 97 comes the closest: It handles all the tasks with the exception of image maps. But neither it nor the other freebie programs support Intermediate features very well. If you want these capabilities, you'll need to spend some cash.

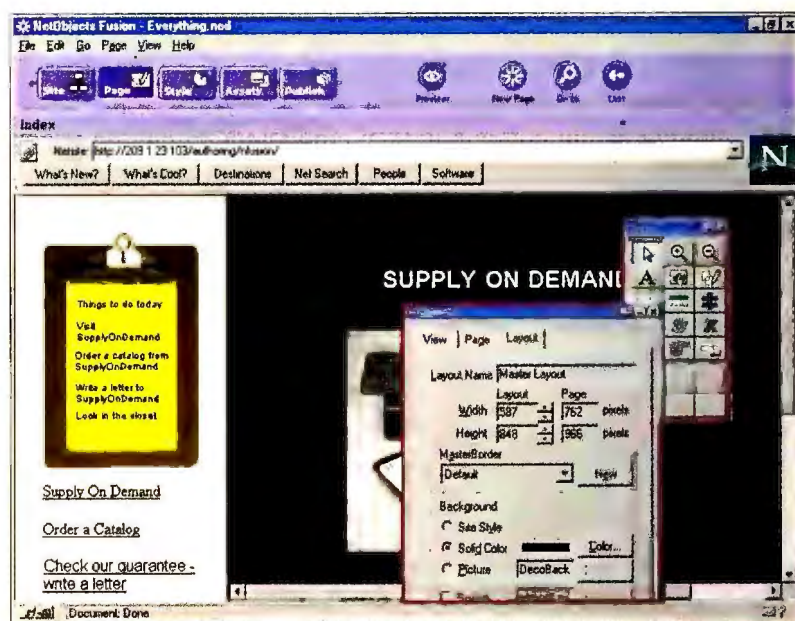
DRESSING UP THE PAGE

OUR PICKS for building Intermediate pages are Fusion and FrontPage 98, both of which provide solid, easy-to-use tools

for building and fine-tuning all of the elements that we added at this level. Creating an image map was a no-brainer. We could insert tables with a mouse click and resize them via click-and-drag mouse moves. Both products create transparent images; like almost every other product here, Fusion can do this trick only with .gif images, but

FrontPage 98 simplifies your life by automatically converting clip art and .bmp images to .gif format. Both FrontPage 98 and Fusion let you drop background sound into a page painlessly, but Fusion gets a gold star for knowing how to make the sound play in both Internet Explorer and Navigator. It's one of only two Web authoring tools (Dreamweaver is the other) to do this.

HotMetal Pro is the best of the rest of the programs, but kludgy sound inser-



FUSION'S MENUS are an all-or-nothing proposition: If you leave them open, they clutter your work space. If you close them, you won't have ready access to your editing tools.

tion and the lack of drag-and-drop table manipulation keep it out of the winner's circle. PageMill doesn't know the first thing about background sound, Dreamweaver can't manage transparent images, and Web.SiteBuilder's file-naming problems—it gives your files abbreviated names, which makes it difficult to find what you've created—knock that program out of the running. ▶

spit-polishing your site

WHERE TO GO IF you want to make your site shine? The Web, of course. There you'll find an arsenal of free (or inexpensive) tools to help improve your site, as well as handy tips. (All the applications listed here are available on PC World Online at www.fileworld.com.)

IMAGE HOKEYPOKEY No matter how great that picture of your new office manager is, you'll probably want to tweak it a bit before you post it on the Web. One of our favorite shareware programs for the job is Paint Shop Pro (for more information about this program, refer to "Best Free Stuff Online" in this issue). Graphics Workshop is good to use if you just want to change file formats quickly.

If you're looking for a touch of *je ne sais quoi* to jazz up your page, plenty of Web sites provide

clip art libraries. Check out Microsoft's at www.microsoft.com/workshop/design, Netscape's Creating Net Sites at home netscape.com/assist/net_sites, and the Web Design Resource site, found at www.pageresource.com.



MOVING PICTURES

There are quite a few .gif animation tools for creating those simple moving images you see on the Web. Three of the most popular are Animagic GIF Animator, GIF Movie Gear, and GIF Tools.

Another trick of the trade: With

a video camera, you can post a continuous stream of images to your site—much the way a weather cam works. SnapCap is a low-price (\$79) publisher that makes short work of the job. You can purchase it from www.halcyon.com/artamedia/snapcap.

THE TECHIE SIDE OF LIFE If you've decided it's time to get serious about editing your own HTML, check out our favorite text editor, TextPad (\$27). This is a great product—it even does special formatting for coding.

When you're ready for the world to see your Web masterpiece, you'll need some site management tools. If your application

doesn't include any, a program called WS_FTP is the best way to shoot files from your computer to your Internet site.

ByteCatcher is another excellent FTP tool. If you lose your Net connection, it actually remembers how far you got before you were cut off, and then allows you to pick up from wherever you left off when you reconnect.

WEB IMPROVEMENT FEVER

Both Netscape and Microsoft offer guides that will steer you to a multitude of helpful suggestions for building a stellar site. Just point your browser to developer netscape.com/guides/tools and www.microsoft.com/workshop.



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Circle 91 on reader service card

ADVANCED PAGE

CLIMBING TO OUR Advanced page required five top-tier exercises:

- Crafting and formatting a mail-in form to gather information from visitors.
- Adding a simple pop-up message via Javascript.
- Dropping in a line of scrolling marquee text using Dynamic HTML.
- Inserting a functional Java applet.
- Dividing the page into two frames.

CASUAL WEB DESIGNERS should abandon ship here. Building an Advanced page is tough, even with the best tools you can get. That means it's time to forget about word processors and browser tools, no matter how nice the price. At this stage, you definitely need a dedicated tool.

IT'S IN THE MAIL

CREATING A MAIL-IN form, which allows you to collect specific information about visitors, is actually fairly easy. Making such a form work, though, requires code called Common Gateway Interface, provided by your Web server.

CGI requires a lot of programming know-how. Our take? We built the form, but we didn't bother with CGI, since most people would probably either bring in a programmer or turn to their Internet service provider to do this task.

Designing a form so it looks good on your Web page can be tricky. FrontPage 98 and Fusion cleared

this obstacle with ease, **DREAMWEAVER'S** Roundtrip technology produces perfect HTML (1). Web.SiteBuilder. Other products, like FrontPage 98 Dreamweaver was easy (2), add all kinds of extra jargon. to use, but it produced a few display anomalies—for example, elements such as buttons were different sizes in different browsers.

Javascript capabilities allow you to create special effects like the pop-up box that says 'Welcome to SupplyOnDemand' when you first click to our mock site. Two packages—Dreamweaver and FrontPage 98—let you insert simple Javascript code by picking choices from a menu. We prefer the way Dreamweaver implements this feature, however—it's more straightforward than the method FrontPage 98 uses.

We chose to use Dynamic HTML to generate the scrolling marquee that says 'Give us 24 hours to supply your office'. Using Dynamic HTML in this way works only for users of Internet Explorer 3.01 and later; text won't scroll in Navigator. FrontPage 98, FrontPage Express, and Word 97 all provide complete support for Dynamic HTML, as does Web.SiteBuilder.

Sizing banners with HotMetal Pro is a little tricky, but working with Dynamic HTML in this program is fairly straightforward. Fusion does scrolling text with an unimpressive Java applet.



webiquette

The Web is an open community, but it's still not cool to appropriate someone else's work (code, text, graphics) without permission. (It is okay to use HTML code as a guide for your own work.) The only way to find out what you can use is to ask. Be especially careful about posting copyrighted material without permission. Better safe than sued.

simple enough to download applets from various Web sites. Unfortunately, inserting the applet into your page, making it work, and formatting it to look good is not an easy task. Fusion, HotMetal Pro, and PageMill make inserting a Java applet relatively easy. But you'll still need to flip back and forth to your browser to see what the running applet actually looks like. FrontPage 98 makes it just a little tougher to

add the applet. Netscape Composer and the two word processors don't let you drop in a Java applet at all.

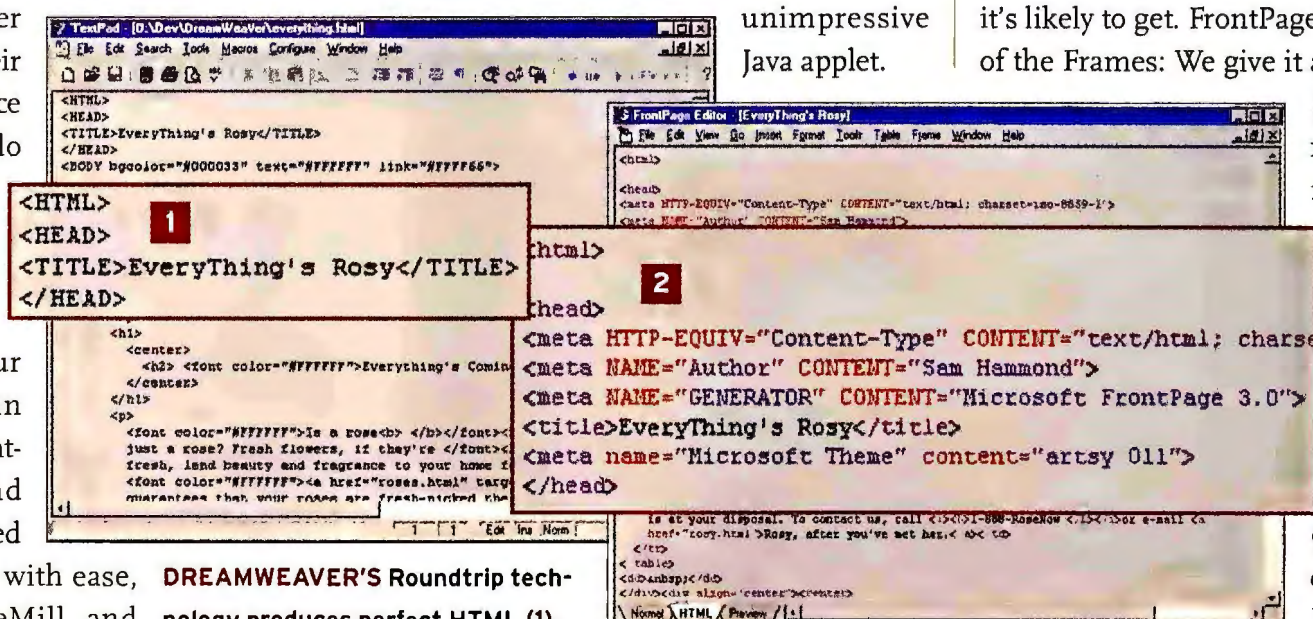
Frames enable you to split a page into sections that operate independently—on our office supply page we created a table of contents in a left-hand frame and kept the rest of the information in a frame on the right. A good Web

authoring tool can make the task of inserting and manipulating frames as bearable as possible—but you shouldn't expect it to be a breeze. FrontPage 98, Fusion, Dreamweaver, and PageMill do a good job of rendering this process as automatic as it's likely to get. FrontPage 98 is the Lord of the Frames: We give it a ten out of ten

(and heavenly music, too) for making frame

creation very nearly painless. Notably, Fusion and PageMill almost match FrontPage 98 for frame creation; and Dreamweaver

performs solidly, too. Web.SiteBuilder does fairly well with frames, but again, the way it renames files makes it difficult to work with. HotMetal Pro doesn't even let you see what's in the frames until you preview the page with your browser. ►



Java applets are little programs that provide special effects on your

Web site. (The real-time clock on our office supply site is an example.) Creating a Java applet is a job for programmers, but it's

CTX

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Circle 64 on reader service card



PC Today (12/97) named the PR500 their Top Pick, calling it a "clear winner for its low price and sharp image."

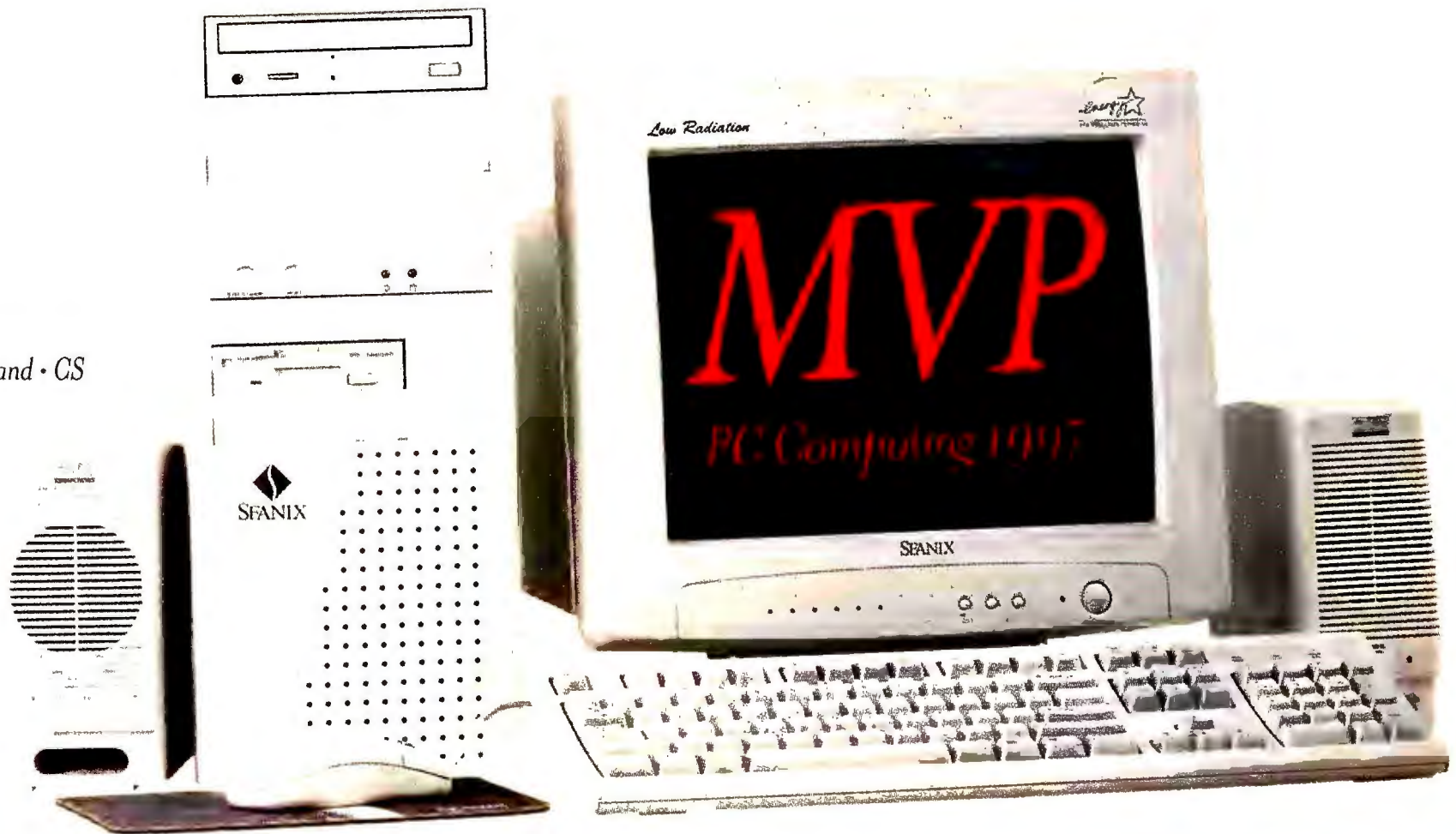
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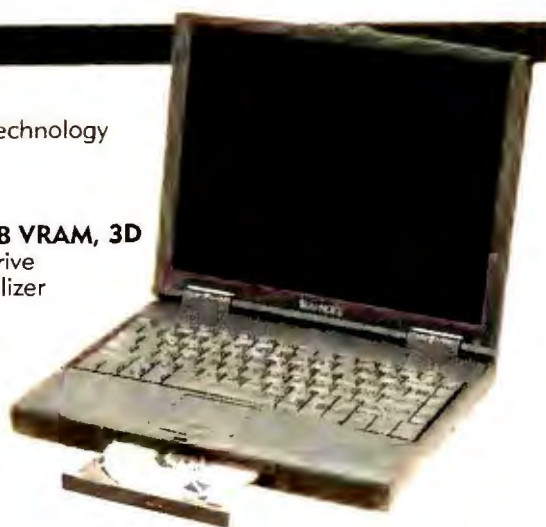
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WORKS FOR YOU?

IF YOU NEED TO throw a basic Web page together, you can easily get away with using Microsoft FrontPage Express, Netscape Composer 4.03, or Lotus Word Pro 97. They have all the power you'll need at the Beginner level. Microsoft Word 97 is almost as good: It loses points only because it has trouble resizing linked JPEG images. But while your business could start with a Beginner page, you might find that you soon want to add more pizzazz—you'll want to use frames to create a table of contents, for example, or add a form so you can take online orders from customers. Unless you're sure you won't want your page to grow and change, you might be better off getting a more capable authoring program right off the bat.

POWERFUL CONTENDERS

ONCE YOU MOVE UP to an Intermediate page, it's easy to spot the most powerful products here: Microsoft FrontPage 98 and NetObjects Fusion 2.02. FrontPage 98 is outstanding on Beginner

pages, outstanding on Intermediate pages, and quite good on Advanced sites. It boasts the best frames capabilities of any product here, and it provides painless preview support for both the Internet Explorer and Netscape Navigator browsers. Okay, we do have a few minor complaints: You can't browse for Java applets, for example. The Javascript feature is powerful, but it's not really automated: If you don't know how to write Javascript in the first place, it really isn't going to help much.

ation. But it doesn't do Dynamic HTML very well, and the current version doesn't support Javascript at all. Our biggest problem with Fusion? At \$295, it costs nearly \$150 more than FrontPage 98 does—and while it has some nice touches, they don't justify the extra one and a half c-notes. FrontPage 98 is simply a better buy.

DREAMING OF PERFECT HTML

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YOU'VE CREATED A SITE that's a Web masterwork, and now you want the world to see it. Unless your company is planning on maintaining its own server, you'll need an Internet service provider to host your page. But even if your current ISP is great for e-mail and surfing the Web, it might be a disaster for your Web page. Your best bet is to shop around. For a list of important questions you should ask, surf over to www.pcworld.com/april98/webauthor.

Another big plus for FrontPage 98 is Microsoft's Personal Web Server, which is an add-on. Although anyone can download this product from Microsoft's Web site for free, it's a lot easier to install it from the FrontPage 98 CD-ROM. With it, you can test some Internet functions (like calling for HTTP or FTP downloads) or the CGI code that brings your mail-in

forms to life, without the hassle of publishing your pages to an online Internet server first.

Fusion does just as well as FrontPage 98 on Beginner and Intermediate pages. Its image mapping capabilities equal those of FrontPage 98 (and that's saying a lot), and it handles background sound even more cleverly, since its sound plays in both browsers. On Advanced pages it incorporates Java applets even more smoothly than FrontPage 98 does, supplying everything you need to make them run the first time, and it's nearly as good on frames cre-

And its few problems are actually quite minor—the lack of click-and-drag resizing is the biggest drawback—but what really puts us off is its astronomical price tag: \$499. For that kind of money you might as well buy a copy of FrontPage 98 and get yourself a flatbed scanner to go with it.

Nonetheless, Dreamweaver has a couple of aces in the hole that make its high price a bit easier to take, especially if you're a professional Web site developer. For one thing, it puts out beautiful code. Dreamweaver's Roundtrip HTML technology writes code that's as clean and elegant as if it had come straight from a high-price programmer. The output contains no superfluous tags and no unnecessary formatting; as a result, the code is ready to edit as is.

Dreamweaver's other strong points are its advanced site-management features (which include a terrific FTP upload and download section) and easy access to the Internet Explorer and Netscape Navigator browsers. These advantages may give you reason to come up with those big bucks.



Find files from this article on PC World Online at www.fileworld.com. Michael Goodwin is a frequent contributor to PC World. Sam Hammond is an Internet programmer specializing in CGI and Java. ■



off-the-rack html

We know, you don't want to learn

HTML. But eventually you'll probably have to bite the bullet—if only to polish the code your Web authoring software puts out. The best way to learn is to browse to your favorite site in Navigator or Internet Explorer, click *View•Document Source*, select the code you're interested in, copy it, paste it into your favorite text editor, and save it as HTML. Then bring up your browser (or your Web authoring software), open the file, and play with the code to see what effect your changes have. Eventually you'll get the hang of coding in HTML.

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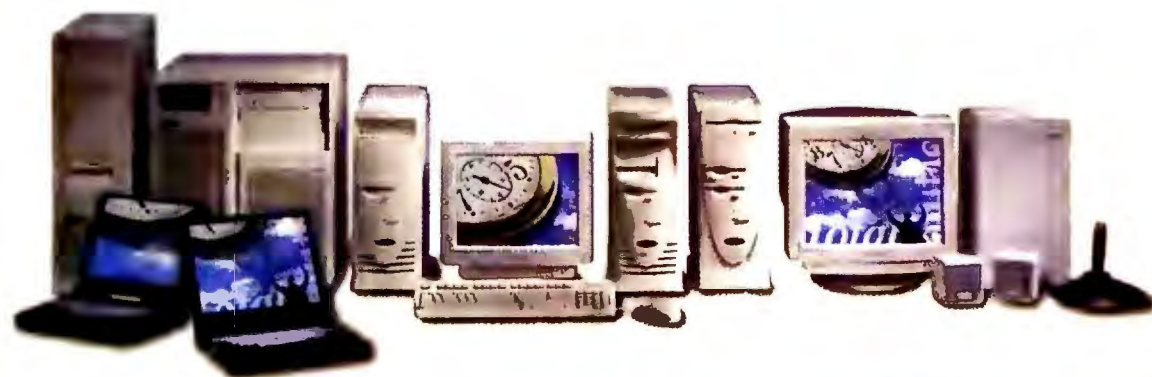


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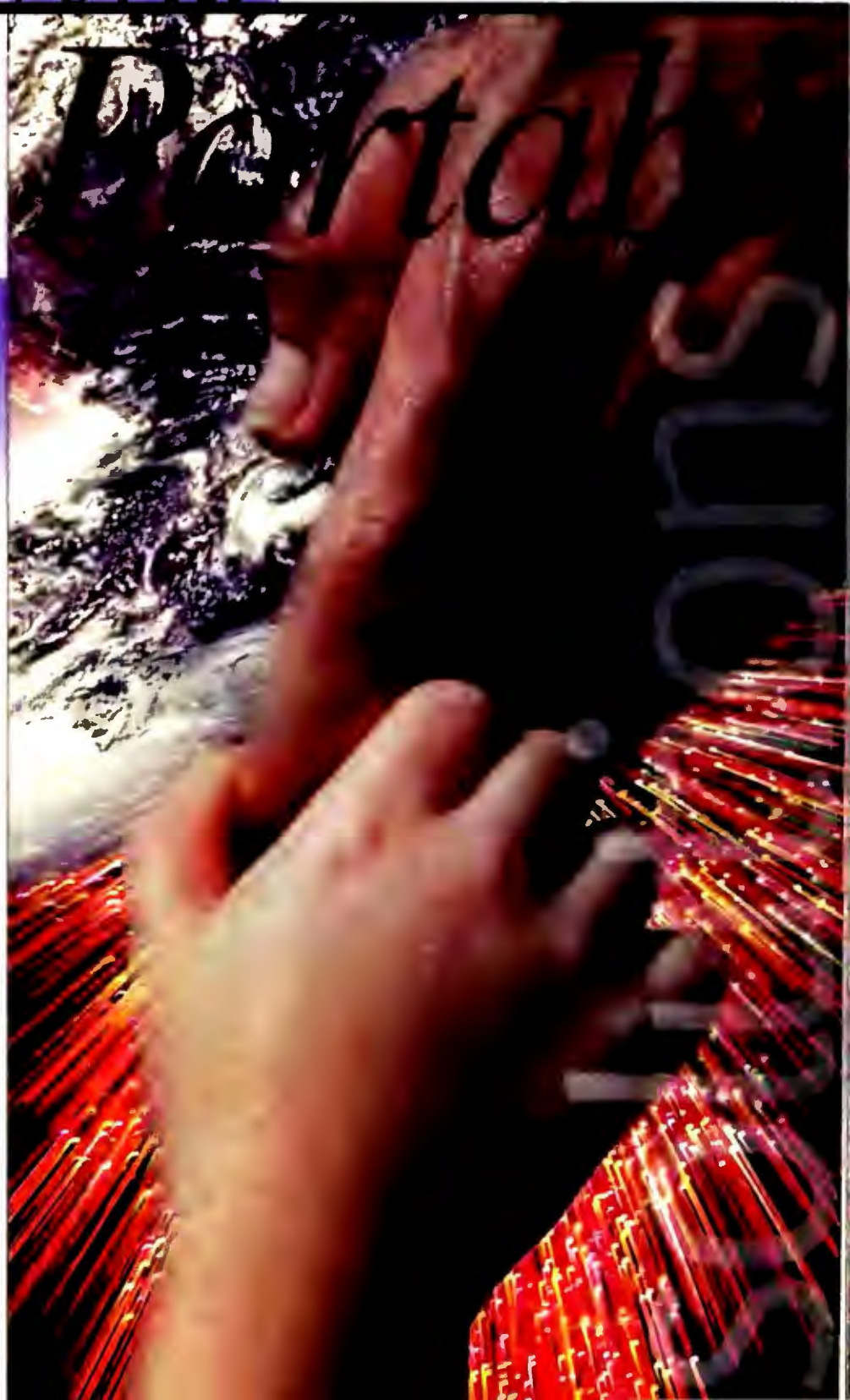
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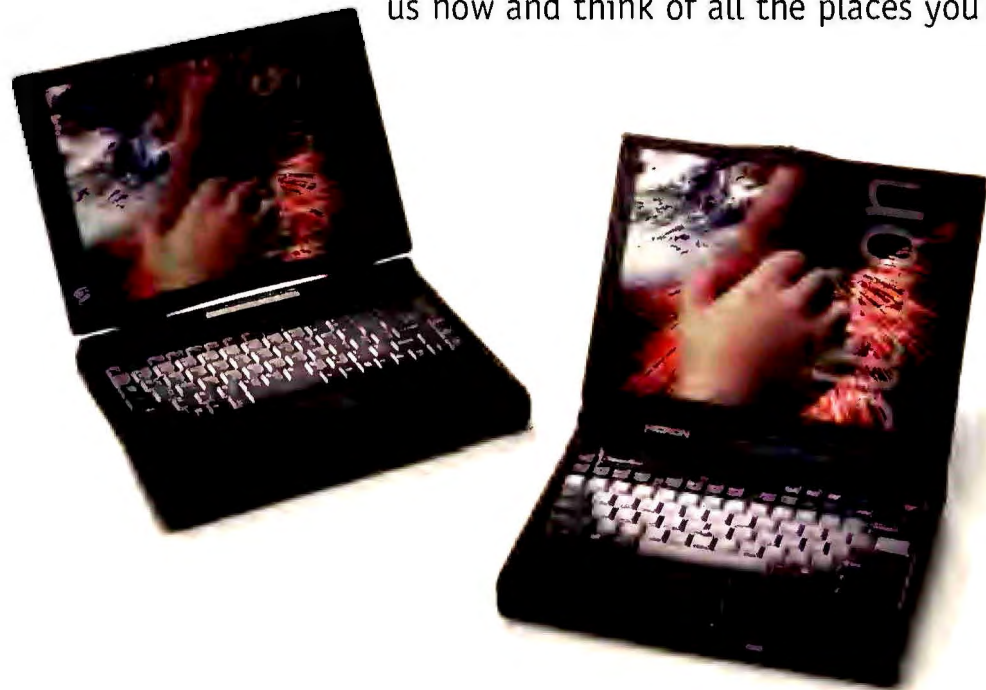
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EdVenture Pak: Creatures by Mindscape, Freddi Fish 2 by Humongous Entertainment, Schoolhouse Rock by Creative Wonders, Reader Rabbit: Kindergarten by The Learning Company, Dr. Seuss Green Eggs and Ham by Broderbund[†]

Arcade Pak: X-Wing vs. TIE Fighter, Need For Speed 2, Command and Conquer: Red Alert, 4 button game pad[†]

Academic Pak: Student Reference Library, Merriam-Webster's Collegiate Dictionary, 10th Addition, National Geographic The 90's, Hoyle Classic Games[†]

FUSION 3D OPTION PAK

DVD-ROM, ** DVD software
DVD PCI decoder card
AWE 64 ISA sound card, Cambridge MicroWorks:
2 speaker satellite with subwoofer stereo system
Fusion 3D game pak: Mech Warrior 2: Mercenaries
D3D/3Dfx version, AH-64D Longbow, U.S. Navy Fighters '97, Command & Conquer, Formula 1 3D3/3Dfx version
Microsoft SideWinder Pro joystick

Available only on
Millennia Xku systems

Add \$499

DVD drive with decoder card add \$199.

* 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 potentials.

** The CD-ROM drive will be removed upon the purchase of the DVD upgrade.

† Available only on Millennium systems with Microsoft Windows 95.

MILLENNIA Xku

STANDARD FEATURES

82440LX chip set
512KB internal L2 cache, 2MB BIOS
Integrated 100MB Iomega Zip drive, 3.5" floppy drive
32X EIDE variable speed CD-ROM drive
32 voice wavetable stereo sound,
Advent 009 speakers with subwoofer
3Com/US Robotics 56K x2 data/fax modem*
Diamond Viper V330 128-bit AGP 3D video
with 4MB SGRAM
Microsoft IntelliMouse, USB connections
Microsoft Windows 95 and MS Plus!
Microsoft Office 97 Small Business Edition
Choice of Micron Software Solutions Pak
5-year/3-year Micron Power limited warranty

MILLENNIA Xku 266

Intel 266MHz Pentium II processor
(features MMX technology)
64MB SDRAM
6.4GB Ultra ATA hard drive
17" Micron 700FGx, .26dp
(16" display)

\$2,199

Bus. Lease \$77/mo.

MILLENNIA Xku 300

Intel 300MHz Pentium II processor
(features MMX technology)
64MB SDRAM
6.4GB Ultra ATA hard drive
17" Micron 700FGx, .26dp
(16" display)

\$2,399

Bus. Lease \$84/mo.

MILLENNIA Xku 333

Intel 333MHz Pentium II processor
(features MMX technology)
64MB SDRAM
6.4GB Ultra ATA hard drive
19" Hitachi SuperScan CM751,
.26dp (18" display)

\$2,749

Bus. Lease \$94/mo.

Portable Solutions

MICRON TRANSPORT[®] X_{KE}

STANDARD FEATURES

512KB pipeline burst cache
128-bit, 2MB DRAM graphics
Pick-a-Point[™] dual pointing devices
16-bit stereo sound and microphone
56Kbps fax/modem*
Dragon NaturallySpeaking Personal voice recognition software
CardBus and Zoomed Video
2 infrared ports, S-Video, NTSC, game USB ports
Mobile Software Solutions
2 Modular expansion bays
Custom nylon carrying case
Microsoft[®] Windows[®] 95 and MS[®] Plus!
Microsoft Office 97 Small Business Edition
5-year/1-year Micron limited warranty

MICRON TRANSPORT V_{LX}

166MHz Intel Pentium processor with MMX technology
24MB EDO RAM (40MB max.)
2.1GB hard drive
16X modular CD-ROM drive
56Kbps fax/modem*
Li-Ion battery
12.1" TFT SVGA, 800x600 display
256KB L2 pipeline burst cache
PCI bus with 128-bit graphics accelerator
MPEG compatible
Zoomed video-ready
Touchpad pointing device
Microphone and 16-bit stereo sound
2-way infrared port
Modular floppy drive
Microsoft Windows 95 and MS Plus!
5-year/1-year Micron limited warranty

\$1,999

Bus. Lease \$70/mo.

MICRON TRANSPORT X_{KE} 233

233MHz Intel Pentium processor with MMX technology
32MB EDO RAM
3GB removable hard drive
20X CD-ROM drive
13.3" TFT XGA display

\$3,299

Bus. Lease \$113/mo.

EXTENDED V_{LX} PORTABLE SERVICE OPTIONS

2nd and 3rd year parts and labor; 3-business-day turnaround for 3 years⁴ \$269

2nd and 3rd year parts and labor; 7-business-day turnaround for 3 years⁴ \$209

MICRON TRANSPORT X_{KE} 266

266MHz Intel Pentium processor with MMX technology
32MB EDO RAM
3GB removable hard drive
24X CD-ROM drive
13.3" TFT XGA display

\$3,499

Bus. Lease \$119/mo.

TRANSPORT OPTIONS

V_{LX} Options: Dragon NaturallySpeaking Personal voice recognition software, 3Com PCMCIA ethernet adapter, 10-Base-T, custom nylon carrying case, Samsonite leather carrying case, 2nd Li-Ion battery, 2.1GB primary hard drive upgrade, 8MB EDO RAM upgrade (24MB total), 24MB EDO RAM upgrade (40MB total)

X_{KE} Options: Microsoft Windows NT 4.0, MicronDock[™] multimedia port replicator with hot docking and built-in battery charger, Micron Executive[™] desktop package: matching black monitor, mouse and keyboard, PCMCIA Ethernet adapter, 10/100 Base-T, leather carrying case upgrade, 2nd modular lithium-ion battery, primary and secondary modular HDD upgrade options up to 8GB, memory upgrade options up to 192MB, auto/air adapter, Multimedia Xcitement Pak

Micron TransPort V_{LX} portable computers start at \$1,799.

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Business Solutions

NetFRAME® LV2000

Intel 233MHz Pentium® II processor
32MB ECC SDRAM
2GB Ultra Wide SCSI-3 hard drive
Microsoft® Windows NT® Server 4.0 (10-user license)
NOS support (3 incident resolutions/1st year), 7x24

STANDARD FEATURES

Single or dual Intel Pentium II processors
512KB integrated cache in SEC package
ECC SDRAM option (4 DIMM slots)
5 expansion slots: 4 PCI, 1 ISA
Integrated Adaptec PCI Ultra Wide SCSI-3 controller
Intel EtherExpress™ Pro 100 NIC
12X SCSI-2 CD-ROM drive
10 drive bays: 4 external 5.25"/1 external 3.5"/
2 internal 5.25"/3 internal 3.5"
Intel LANDesk® Server Manager v.2.8
Dedicated server technical support, 7x24
5-year/3-year Micron Power™
limited warranty
1-year next-business-day
on-site service††

\$3,499

Bus. Lease \$119/mo.

NetFRAME MV5000

Intel 300MHz Pentium II processor
64MB ECC SDRAM
4GB Ultra Wide SCSI-3 hard drive
Microsoft Windows NT Server 4.0 (10-user license)
NOS support (3 incident resolutions/1st year), 7x24

STANDARD FEATURES

Single or dual Intel Pentium II processors
512KB integrated cache in SEC package
Memory: ECC EDO or SDRAM option
9 expansion slots: 6 PCI, 2 ISA, 1 shared ISA/PCI
Dual integrated Symbios Ultra Wide SCSI-3 controllers
Intel EtherExpress™ Pro 100 NIC
Embedded RAID upgrade option
I₂O ready via embedded Intel i960-RD
5 internal, hot-pluggable, hard drive array bays
(upgradable to 10)
One 360-watt hot-pluggable power supply standard
(Upgradable to 3 for added redundancy)
Rack adapter option
Intel LANDesk Server Manager v.2.8
Dedicated server technical support, 7x24
5-year/3-year Micron Power
limited warranty
1-year next-business-day
on-site service††

\$5,699

Bus. Lease \$181/mo.

††On-site service for NetFRAME LV2000 and MV5000 server is provided by Digital Equipment Corporation and is optional.

MICRON POWER WARRANTY

5-year limited warranty on microprocessor and main memory
3-year limited parts only system warranty (1 year for TriStar® systems)
1-2 or 4-year optional on-site service agreement for Micron desktop and server systems
30 days of free Micron supplied software support for Micron desktop systems; 3 optional network operating system incident resolutions included for Micron server systems
30-day money back policy
24-hour technical support

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Technical Support Available 24 Hours A Day, 7 Days A Week
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Toll-free from Puerto Rico: 800-708-1756
International Sales: 208-893-8970
International Fax: 208-893-7393

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CLIENTPRO® Vxe

Intel 166MHz Pentium processor with MMX technology
Microsoft Windows NT Workstation

\$1,149

Price excludes monitor.

Bus. Lease \$40/mo.

CLIENTPRO MRe

Intel 233MHz Pentium processor with MMX™ technology
32MB SDRAM
2.1GB SMART Ultra ATA hard drive
15" Micron 500Lx, .28dp (13.7" display)

STANDARD FEATURES

512KB pipeline burst cache, DMI compliant,
2MB flash BIOS
Network adapter with Wake-On-LAN technology
24X CD-ROM drive ATAPI variable speed
S3 ViRGE graphics accelerator, 2MB EDO RAM
Intel LANDesk Client Manager available
Advanced hardware monitoring and power
management features
Chassis intrusion alert
Microsoft Windows NT Workstation
5-year/3-year Micron Power
limited warranty

\$1,549

Bus. Lease \$54/mo.

CLIENTPRO 766Xi

Intel 266MHz Pentium II processor featuring MMX technology
64MB SDRAM
3.2GB SMART Ultra ATA hard drive
17" Micron 700FGx, .28dp (16" display)

STANDARD FEATURES

512KB internal L2 secondary cache, DMI compliant,
2MB flash BIOS
24X ATAPI variable speed CD-ROM drive
Network Adapter with Wake-On-LAN technology
4MB AGP 3D video
Creative Labs Sound Blaster™ 16 sound card w/speakers
Microsoft Windows NT Workstation
Intel LANDesk Client Manager available
Advanced hardware monitoring and
power management features
Chassis intrusion alert
5-year/3-year Micron Power
limited warranty

\$2,399

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Configured For Your Life™

New 19-inch monitors are giving 21-inch models a run for your money. Here are the hot tickets.

THE STEADY TREND toward miniaturization in computer components brings new meaning to the phrase "less is more." Smaller disks hold more data, smaller chips deliver more power, and smaller systems pack more features than ever before. More is still more, however, when ►

TOP: Our Best Buy 19-inch monitor, Iiyama's new Vision-Master 450. BOTTOM: Best of the 21-inch bunch, Cornerstone Imaging's Color 50/101sf.

Big

BY PETER M.
STOLLER

Screen Debuts

PHOTOGRAPHS BY
ROBERT CARDIN



BIG-SCREEN MONITORS

19 INCHES		FEATURES						
		Street price (1/15/98)	Tube manufacturer	Dot or stripe pitch (mm)	Viewable screen diagonal (inches)	Max. refresh rate at 1280 by 1024 (Hz)	Max. refresh rate at 1600 by 1200 (Hz)	Width by depth by height (inches)
1	Iiyama VisionMaster 450*	\$899	Hitachi	.26 dot	17.6	94	76	17.7 by 17.6 by 17.6
2	Cornerstone Imaging Color 45/101sf	\$1044	Hitachi	.26 dot	17.6	94	76	17.6 by 18.1 by 17.8
3	Hewlett-Packard M-900	\$958	Hitachi	.26 dot	17.7	89	75	17.6 by 18.1 by 17.9
4	Hitachi SuperScan Elite 751	\$969	Hitachi	.26 dot	17.7	85	75	17.6 by 18.1 by 17.9
5	Dell 1200 HS	\$924	Hitachi	.26 dot	17.6	88	75	17.7 by 18.3 by 17.3
21 INCHES								
1	Cornerstone Imaging Color 50/101sf*	\$1535	Hitachi	.28 dot	19.4	94	77	19.2 by 20.7 by 18.7
2	Mitsubishi Diamond Pro 1000	\$1750	Mitsubishi	.28 stripe	19.5	107	85	19.7 by 19.2 by 19.3
3	Sony Multiscan GDM-500PS	\$1799	Sony	.27 stripe	19.7	85	85	19.6 by 18.7 by 19.9
4	Iiyama VisionMaster Pro 500	\$1449	Mitsubishi	.28 stripe	19.0	102	76	19.4 by 19.3 by 19.3
5	Princeton Graphic Systems Caliente C2001	\$1499	Mitsubishi	.28 stripe	19.4	100	85	16.1 by 18.0 by 15.8

* Best Buy

See Top 10 chart, page 239.

☒ Yes ☐ No¹ Specialized connector used for some high-end graphics cards and non-PC devices.² Phone line is automated for 12 hours after 5 p.m.

it comes to the size of one component: the monitor.

Until recently, the only big monitors—20- and 21-inch models—came at a correspondingly big cost. While prices are down on 21-inchers, they're still expensive: \$1535 on average for the models reviewed this month. That leaves an immense gulf between their cost and the \$700 average price of a good 17-inch model—not to mention the huge difference in size and weight.

AFFORDABLE BIG SCREENS

NOW THERE'S A NEW CLASS of monitors to bridge the gap. Late last summer, the big-screen picture changed dramatically when Hitachi introduced its new short-neck 19-inch tube, which

allowed the manufacture of relatively inexpensive big screens in space-saving designs. A bevy of products based on this new CRT technology rapidly hit the market, and before long the average cost of a 19-inch monitor was under \$1000. While all the 19-inchers we reviewed are based on Hitachi's tube, a number of other

manufacturers—including heavyweights such as Matsushita (Panasonic) and Mitsubishi, comple-

mented by other major players like Sony and Toshiba—have recently announced plans to field tubes of their own. Meanwhile, 20-inch monitors appear to be a dying breed—a bit too expensive to be a good deal, while not providing enough screen area to compete with the higher-end 21-inchers.

The two dozen big monitors we looked at are almost evenly split between the 19-inch and 21-inch classes. We also reviewed three 20-inchers that didn't make the chart: a low-cost Sony Trinitron, a higher-end IBM Trinitron, and a dot pitch monitor that KDS markets as a 19-inch model. Although many monitors here use the same tube, differences in supporting electronics make for big differences in picture quality.

To rate the performance of the monitors we tested, we tabulated the opinions of five *PC World* experts and five "typical users" who viewed a battery of test images under controlled lighting conditions designed to simulate a typical office environment. Sample images included a spreadsheet, a newsletter, and a line art illustration to evaluate the resolution of fine lines and text; we also viewed a variety of photographs and a photomontage to judge focus, brightness, contrast, color quality, and the ability to display 3D effects. Monitors were assigned grades of excellent, very good, good, and satisfactory for both text and graphics (no monitor received less than a satisfactory score). Each grade represents a range, so it's possible for one monitor with very good graphics to outscore another. For more information, see the performance chart "Big-Screen Monitors."

Aside from a good picture and a fair price, you'll want your new monitor to be easy to adjust. Almost all monitors today feature on-screen displays, usually with control gauges for easier adjustments. The best have readily understandable icons and descriptions that make clear how and what to adjust to shape up your screen. Control interfaces range in number from a few to as

Best Buys

ON ANY MONITOR, it's the picture that counts, and superb display quality is what makes our big-screen Best Buys stand out. **Iiyama's VisionMaster 450** is the star of our 19-inch category, thanks to its impeccable text, great-looking graphics, and aggressive \$899 price. Among 21-inchers, **Cornerstone Imaging's \$1535 Color 50/101sf**—number one in last November's *Top 10 Monitors* chart—comes through again with the best overall picture we've ever seen.



ON-SCREEN CONTROLS							COMPLIANCE				SUPPORT		
Weight (lbs.)	Screen position and size	Pincushion/barrel	Trapezoid/keystone	Focus/convergence	Image tilt/manual degauss	Color temperature/RGB control	Plug and Play	MPR-II low emission	TCO shielding	BNC port	Warranty (years)	Toll-free tech support (hours)	Weekend support
50.7	●	●/●	●/●	○/●	●/●	●/●	●	●	○	●	3	12	○
55	●	●/●	●/●	○/○	●/●	●/●	●	●	○	○	3	11.5	○
55	●	●/●	●/●	○/○	●/●	●/●	●	●	●	○	3	11	○
53	●	●/●	●/●	○/○	●/●	●/●	●	●	○	○	3	8	○
55	●	●/●	●/○	○/●	●/●	●/●	●	●	●	○	1	24	●
72.6	●	●/●	●/●	○/○	●/●	●/●	●	●	○	○	3	11.5	○
77	●	●/●	●/●	○/●	●/●	●/●	●	●	●	●	3	12	○
68.3	●	●/●	●/●	●/●	●/●	●/●	●	●	●	●	3	24	●
68.2	●	●/●	●/●	○/●	●/●	●/●	●	●	●	●	3	12	○
72.8	●	●/●	●/○	●/●	●/●	●/●	●	●	●	●	3	24 ²	●

many as a dozen buttons on the bezel. We rated the controls for each monitor—for details, see the individual reviews.

BEST OF THE BEST

THE TOP OVERALL value in each category earned a Best Buy. Iiyama's Vision-Master 450 headed the 19-inch class with an \$899 price—a high-quality big screen with faultless text and terrific graphics. If you want top-notch graphics and can spend \$145 more, the \$1044 Cornerstone Imaging Color 45/101sf, ranked number two, had the best picture.

Among the 21-inchers, Best Buy honors went to Cornerstone Imaging's Color 50/101sf, which delivers picture-perfect text and graphics at a midrange price of \$1535. However, most graphics pros will prefer our second-ranked model, Mitsubishi's \$1750 Diamond Pro 1000. It costs more, and its picture isn't quite as perfect, but it has advanced features—such as the ability to refresh at faster rates at the highest resolutions and a convergence control for adjusting electron gun alignment as the monitor ages—that will appeal to people who work in desktop publishing or Web design.

Nineteen-inch models from Dell, Hitachi, and Hewlett-Packard also made our chart, as did 21-inchers from Iiyama, Princeton Graphic Systems, and Sony (its winner based on its brand-new 21-inch Trinitron tube). See *Top 10 Monitors* in this issue. Models in the 19-inch class that missed the chart included entries from

Budget for Spring 1998 Expenditures

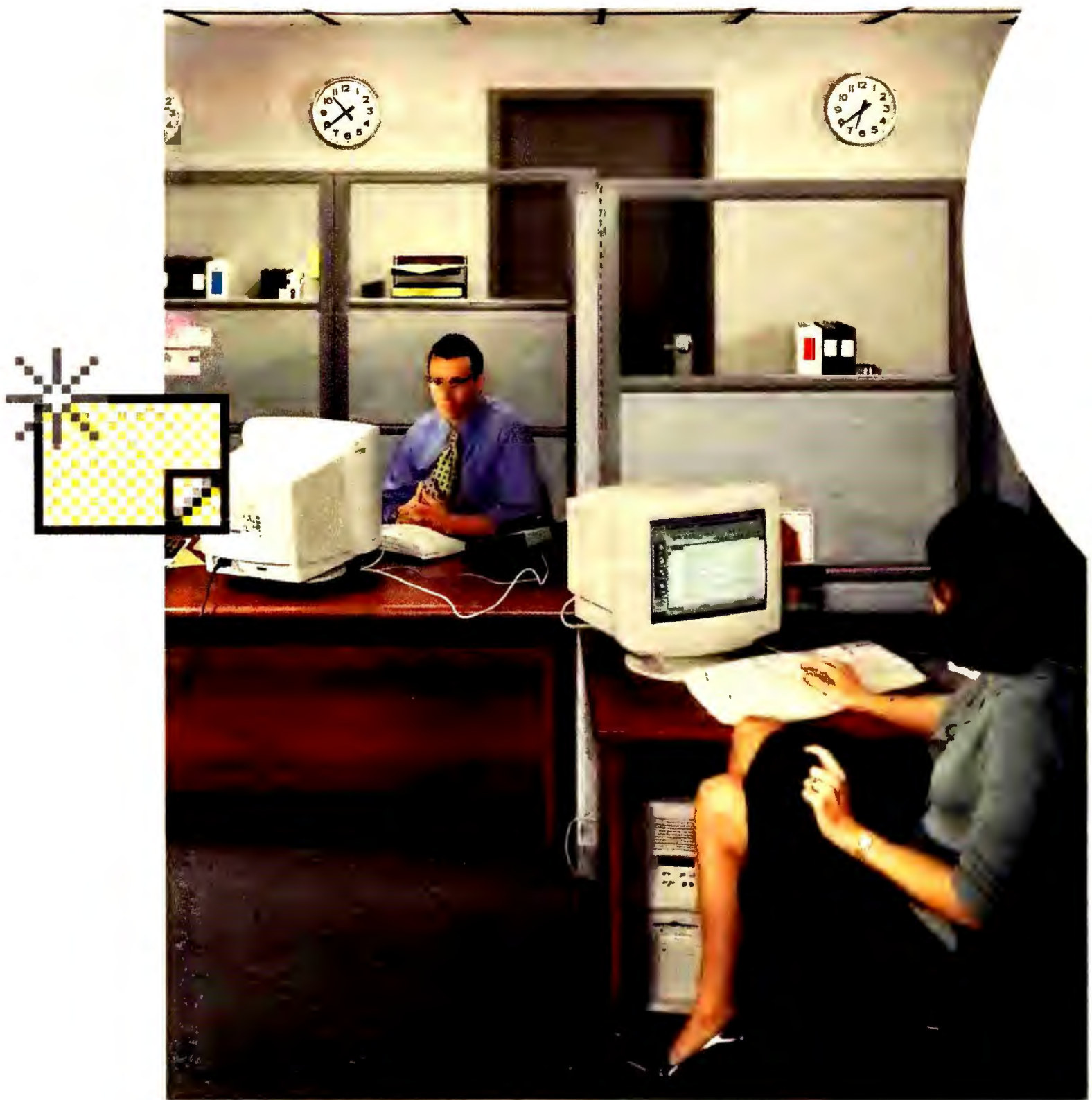
	Desktop Computers	Notebook Computers	Printers	Monitors	Graphics Boards	Modems	Backup Hardware	CD-ROM Drives	CD-R Drives	Surge Protectors	U	Software	EXPANDED TOTAL
Rough Mountain Division													
Sales	\$75,776.01	\$27,672.83	\$9,013.21	\$20,971.14	\$719.22	\$3,400.00	\$19,995.00	\$2,235.00	\$2,500.00	\$2,399.00	\$980.00	\$17,900.00	\$109,161.43
Warehouse	\$6,233.05	\$0.00	\$463.11	\$775.82	\$0.00	\$0.00	\$593.85	\$0.00	\$0.00	\$59.98	\$0.00	\$0.00	\$8,122.81
Delivery	\$2,280.99	\$15,723.49	\$1,177.85	\$695.32	\$0.00	\$170.00	\$1,199.70	\$0.00	\$1,000.00	\$59.98	\$0.00	\$1,870.00	\$25,011.37
Information Services	\$0.00	\$0.00	\$1,177.85	\$0.00	\$0.00	\$240.00	\$199.95	\$0.00	\$500.00	\$119.96	\$236.00	\$0.00	\$4,723.76
Accounting	\$9,543.77	\$0.00	\$975.98	\$3,078.22	\$156.95	\$0.00	\$399.95	\$0.00	\$0.00	\$59.98	\$0.00	\$0.00	\$14,414.65
Support Services	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$170.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$170.00
Security	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,900.00	\$1,900.00
Human Resources	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,500.00	\$1,500.00
Subtotal	\$94,832.84	\$43,405.32	\$12,813.90	\$25,524.90	\$876.17	\$4,080.00	\$22,594.35	\$2,235.00	\$4,000.00	\$3,298.90	\$976.00	\$27,590.00	\$244,629.98
McQuinn City Division													
Sales	\$22,732.81	\$8,201.85	\$2,703.56	\$6,291.34	\$215.77	\$1,020.00	\$5,995.50	\$670.50	\$750.00	\$3,598.80	\$776.00	\$21,480.00	\$90,593.53
Warehouse	\$1,865.52	\$0.00	\$140.73	\$232.75	\$0.00	\$0.00	\$179.96	\$0.00	\$0.00	\$71.98	\$0.00	\$0.00	\$2,458.33
Delivery	\$394.30	\$4,720.05	\$353.36	\$303.90	\$0.00	\$51.00	\$353.91	\$0.00	\$300.00	\$71.98	\$0.00	\$2,038.00	\$9,978.38
Information Services	\$0.00	\$0.00	\$353.36	\$0.00	\$0.00	\$102.00	\$99.99	\$0.00	\$190.00	\$9.00	\$0.00	\$253.50	\$527.84
Accounting	\$2,853.13	\$0.00	\$232.76	\$323.47	\$47.08	\$0.00	\$173.95	\$0.00	\$0.00	\$71.98	\$0.00	\$0.00	\$4,378.39
Support Services	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$51.00	\$0.00	\$0.00	\$0.00	\$9.00	\$0.00	\$0.00	\$69.00
Security	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$6.00	\$0.00	\$0.00	\$6.00
Human Resources	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,500.00	\$1,500.00
Subtotal	\$28,492.15	\$13,021.90	\$3,844.17	\$7,851.35	\$262.85	\$1,224.00	\$6,778.31	\$670.50	\$1,040.00	\$3,679.78	\$776.00	\$25,261.50	\$99,385.04
Repeats last action or command													
Warehouse	\$7,479.66	\$0.00	\$562.93	\$330.96	\$0.00	\$0.00	\$719.82	\$0.00	\$0.00	\$71.98	\$0.00	\$0.00	\$8,765.37
Delivery	\$3,537.13	\$18,982.19	\$1,413.42	\$879.18	\$0.00	\$204.00	\$1,439.64	\$0.00	\$1,200.00	\$71.98	\$0.00	\$2,078.00	\$23,013.60
Subtotal	\$11,016.79	\$18,982.19	\$2,016.35	\$1,210.14	\$0.00	\$204.00	\$2,159.46	\$0.00	\$1,200.00	\$143.96	\$0.00	\$2,078.00	\$27,751.70
OVERALL GRAND TOTAL	\$240,058.13	\$110,875.62	\$31,051.74	\$64,716.49	\$2,239.02	\$9,304.00	\$56,961.65	\$5,965.50	\$9,500.00	\$10,986.54	\$22,726.00	\$73,113.00	\$637,093.79

1024 X 768
1152 X 864
1280 X 1024

YOU CAN COMPARE this whole sheet at once at a resolution of 1280 by 1024. At 1152 by 864, you must scroll to see the edges. But you're in for a lot more scrolling at 1024 by 768.

Compaq, MAG InnoVision, Philips, Sampo, and ViewSonic Optquest. In the 21-inch class, models from KDS, NEC, Nokia, Panasonic, Samsung, and ViewSonic also missed. See PC World Online (www.pcworld.com/april98/monitors) for their reviews.

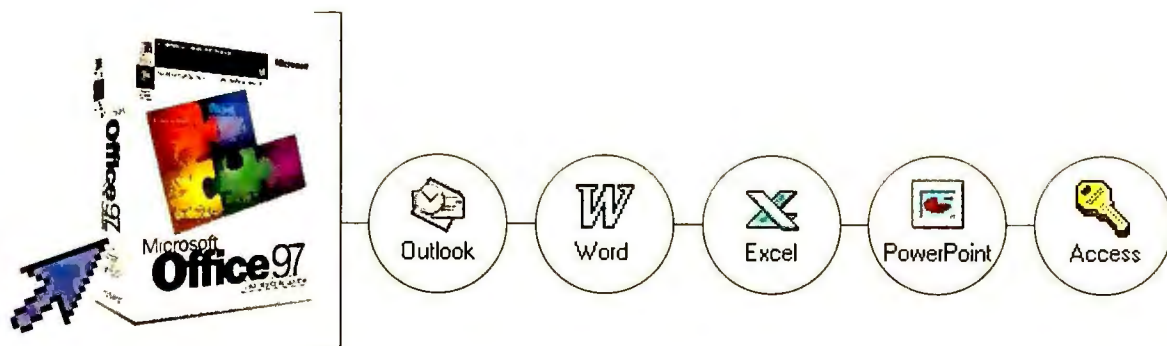
All the monitors we tested earned a grade of good or better when it came to displaying text at our test resolution; half were rated very good. But only the two Best Buys—the 21-inch Cornerstone Imaging Color 50/101sf and the 19-inch Iiyama



And

*Connect-time charges may apply.

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your ego screams for
some credit.**

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Sent: Friday, 10:37 p.m.
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Subject: A job well done.

Microsoft® Office 97 encourages cooperation among teams by giving credit where credit is due. As everyone works on a document or project, they're free to exchange ideas and information, all electronically. Expressing opinions, revising the wording, proofing the copy, adding sections, inserting hyperlinks—they're all recorded with the original document, and everyone's got their name on them. If you're in charge of the project, you're in control. Use the comments you like and toss the ones you don't, knowing who contributed what, when and why. You don't have to retype anything; you revise as you go. You don't have to save a new version for each round of changes; you only save the changes. Then you just say, thanks for the help, guys. For more help, and to find out about the free* online product enhancements and assistance available through Microsoft Office Update, visit www.microsoft.com/office/.

VisionMaster 450—rated excellent for text. Graphics quality was less consistent, although three models rated excellent: both Cornerstones and the 21-inch Sony Multiscan GDM-500PS. Six units scored as very good, seven were rated good, and five squeaked by with only a satisfactory grade. For image quality scores of our chart makers, see the performance chart “Big-Screen Monitors.”

BIG...AND BIGGER

ASIDE FROM BEING, on average, more than a third lower in price, how do 19-inch monitors compare with their 21-inch counterparts? Both have noticeably bigger screens than the 17-inch models now standard for most new business PCs. Whereas the 17-inch tube has an actual viewable screen of 15.7 inches on average, the 19- and 21-inchers generally have viewable screens of about 17.7 and 19.4 inches, respectively. That's more than a quarter bigger than the 17-incher in the case of 19-inch model—and over half again as large with a 21-incher. But unless you're having trouble reading from your 17-inch monitor, you probably don't want bigger text; you want more on screen at once—so you can compare several columns without having to scroll back and forth.

Cranking up the resolution will do the trick—putting a lot more on screen at once without crowding your display or making you squint at the fine print. If you go from 1024 by 768 on a 17-inch model to 1152 by 864 on a 19-incher, you'll put 27 percent more on screen without shrinking your text, spreadsheet cells, and icons. With a 21-inch unit, you'll be able to comfortably increase your resolution still further to 1280 by 1024—putting 66 percent more on screen, at the cost of only a slight reduction in print size compared to 1024 by 768 on a 17-inch monitor. (For a graphical comparison of screen resolutions, see the infographic near the bottom of the preceding page.) Graph-

ics professionals, desktop publishers, Web designers, and spreadsheet jockeys all benefit from a big screen, but average business and home users also will be able to save scads of extra scrolling and games of hide-and-seek with layered windows.

All this month's monitors are capable of 1600 by 1200 resolution. The catch? Most users will find text uncomfortably cramped—even on a 21-incher—and clarity can suffer, with fuzzy letters on all but the best. In addition, at the highest resolutions, your graphics board may not be able to deliver a full palette of colors or refresh your screen at a fast, flicker-free rate (at least 75 Hz for most users, 85 Hz for more sensitive people). Many older boards—and some newer ones—won't be up to the task, even at a resolution of 1280 by 1024. For details on whether you need a new graphics card to go with your big, high-resolution monitor, see “The Graphics Matchmaker” on PC World Online at www.pcworld.com/april98/monitors.

Seeking an even bigger monitor for presentations or entertainment? We also took a look at a moderately priced, low-resolution 31-inch monitor. See “The Lowest-Cost Jumbo Screens.”

ARE YOU READY FOR A BIG SCREEN?

ARE BIG MONITORS for everyone? No. The primary drawback for most people is price, but other factors enter in, such as whether you have enough desk space. A good rule is to picture a cube the size of the diagonal measurement of the tube: A 17-incher will take up about 17 by 17 inches on your desktop plus 17 inches of headroom. Fortunately, most 19-inchers are exceptions, taking up only a bit more desktop depth than 17-inchers. So even if your 17-inch model butts against the wall, you can buy a 19-incher without winding up with your nose pressed against the screen.

Prices should come down further this summer as competition heats up, with Mitsubishi Diamondtron and Sony Trinitron 19-inch aperture grille models available. See *New Products* in this issue for our evaluation of a prerelease version of Sony's brand-new 19-inch Trinitron model, the Multiscan GDM-400PS. ►

Buying Tips

HERE ARE a few tips for getting the best bang for your buck.

- Make sure your new monitor comes with a generous return policy—at least a 30-day money-back guarantee, with a minimal restocking fee (if any).
- Find out if the manufacturer stands behind the monitor it sells you. Most companies offer three-year, all-inclusive warranties, but some—Dell, for example—cover the monitor for only one year. You may find the Compaq, Dell, Hitachi, HP, IBM, KDS, Princeton Graphic Systems, MAG InnoVision, NEC Technologies, and Sony monitors (all of which we reviewed this month) bundled with computer systems. If so, they will typically be covered by the same warranty as the PC.
- Be sure to pay by credit card rather than cash, check, or COD. If there's a problem with the monitor, your credit card company can go to bat for you, and some credit cards will also extend the manufacturer's warranty.



THE MANY CONTROL BUTTONS on the Cornerstone, Hitachi, and HP models give you more direct access to control functions.



IYAMA USES FEWER BUTTONS: You access most of the individual controls by using the on-screen display's menu system.

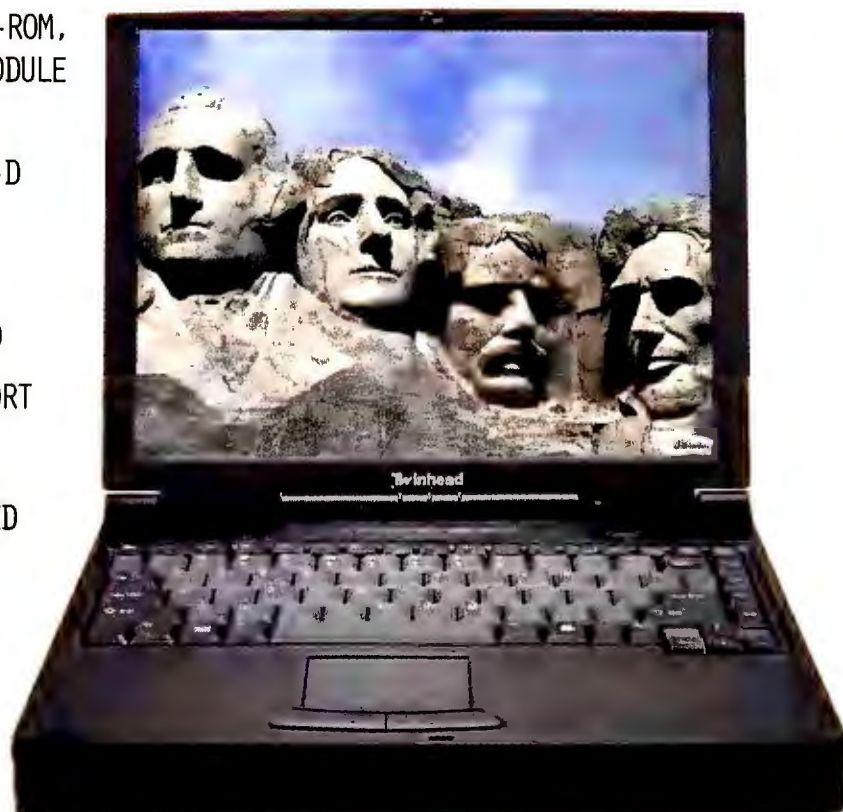
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Circle 240 on reader service card



19-Inch Models

1 IIYAMA VISIONMASTER 450

PRO: Exceptionally sharp picture, fine color performance, terrific price.

CON: No numeric values for control adjustments.



With its VisionMaster 450, Iiyama has assembled the magic combo needed to get our top recommendation—high quality and low price. At \$899, the VisionMaster 450 is inexpensive for a 19-inch monitor, and it stands out for its supersharp text. The screen display had impeccable focus from corner to corner, and it passed all our small-font torture tests with ease: The URL on our Web page was crisp, and the fine print in our newsletter and spreadsheet was laser-sharp. The Iiyama was no slouch at rendering rich, beautiful colors in our photographic tests, either. Details were apparent in heavily shadowed sections of a shaded waterway in our test screen, and the colors in a photo of fresh fruit were vibrant and true. This stellar performance is all the more impressive given that all the 19-inch models reviewed use the same Hitachi tube.

It's easy to adjust the VisionMaster 450 using Iiyama's clean, intuitive three-button controls. Just tap the far-left (Menu) button to go to the full on-screen display, then use the buttons to the right to navigate the menu. While this technique isn't quite as easy as making adjustments on the Cornerstone, Hitachi, and HP monitors—where a larger array of buttons gives direct access to individual controls—it's one of the best of the menu-driven systems. Our main criticism is that the on-screen gauges lack numeric values, which would make it easier to fine-tune adjustments. Also, the menu is on the small side—a bit hard to see for some users. But these complaints are minor in light of the VisionMaster's superb picture.

Iiyama provides a fairly typical three-year warranty, with 12 hours of weekday toll-free support. Iiyama, 800/394-4335, www.iiyama.com

READER SERVICE NO. 675

2 CORNERSTONE IMAGING COLOR 45/101SF

PRO: Dazzling graphics quality, sharp text.

CON: Fairly expensive, user must press Store to save image adjustments.

The \$1044 Cornerstone Imaging Color 45/101sf is the most expensive 19-inch monitor to make our list, but if you want to get great big-screen graphics without shelling out for a 21-incher, it's still a fine value. Our judges were impressed with this unit's striking, realistic colors, as well as the depth and detail of its photographic images—the best in this category. In our test screen of a shaded waterway, we noticed the tiny form of a car that on most monitors merged with distant trees. The Color 45/101sf also won high marks for text with a crisp URL address on our Web page and sharp smaller fonts on our spreadsheet screen and newsletter; its text score, however, was not quite as high as the Iiyama's.

Another feature we liked on this Hitachi-based monitor: Instead of 2 or 3 buttons to navigate a multilevel menu, 12 clearly labeled buttons give you direct access to controls. However, we didn't like having to hit a Store button to save the settings: ►



AT LEFT: Cornerstone's Color 45/101sf.

UPPER RIGHT: HP's new 19-inch M-900.

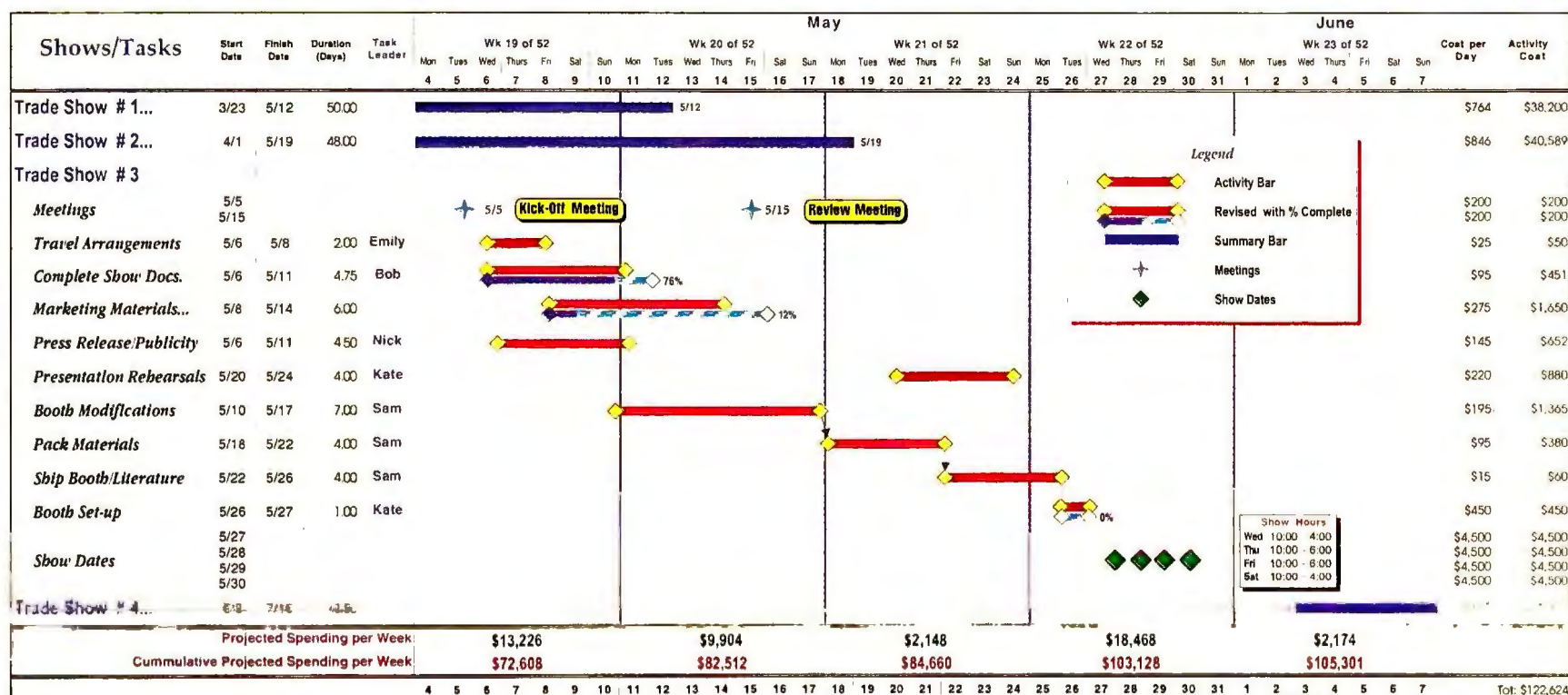
LOWER LEFT: Dell's 1200 HS
LOWER RIGHT: Hitachi's SuperScan Elite 751.

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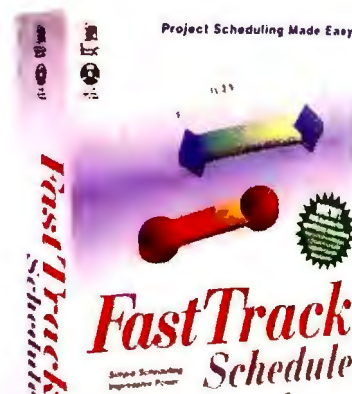
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Most monitors save settings automatically. In addition, the lack of a solid background behind the on-screen icons makes them a bit hard to see. Cornerstone offers a three-year warranty, with 11.5 hours a day of toll-free weekday tech support. *Cornerstone Imaging*, 800/562-2552, www.corimage.com READER SERVICE NO. 676

3 HP M-900

PRO: Great image quality, good price.

CON: Need to hit Store to save adjustments. The \$958 Hewlett-Packard M-900 made a strong showing with its ability to display text or graphics with equal ease. Our judges appreciated the clearly readable fine print in our newsletter, along with the accurate colors in our scanned photo of Olympic runners. The M-900 didn't have quite the sharpness of the Iiyama or Cornerstone, but it's a fine performer overall. It also has better shielding against electromagnetic field emissions: It's the only 19-incher here that complies with TCO'95, the world's toughest specification on EMFs.

For controls, the M-900 has the same Hitachi-style interface as the number two Cornerstone—with the same strengths and weaknesses. However, HP has printed its labels on the buttons rather than underneath them; we wonder if the printing might wear off with use. HP provides a three-year warranty and 11 hours per weekday of toll-free support. *Hewlett-Packard*, 800/752-0900, www.hp.com READER SERVICE NO. 677

4 HITACHI SUPERSCAN ELITE 751

PRO: Great picture, good price.

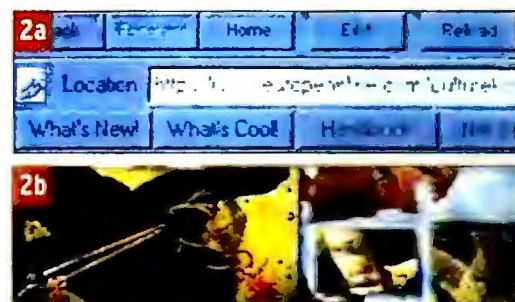
CON: Short support hours, no autosave feature.

Hitachi's \$969 SuperScan Elite 751 did very well in our November Top 10 Monitors review, and it made a strong showing again this month. The SuperScan Elite 751 is virtually identical to the Hewlett-Packard M-900—no surprise, considering they use the same tube, electronics, and controls. In addition, they share the same fine image quality and control interface, and they're a mere \$11 apart in price. Except for the logos and the Hitachi's harder-to-read buttons (the icons aren't a different color, but are merely inscribed in the plastic), you might not be able to tell them apart.

Two factors pulled the Elite 751 below the HP M-900: Hitachi's phone support hours are among the shortest in the industry—only 8 hours per weekday; and the SuperScan lacks the M-900's TCO'95 compliance. While the MPR-II compliance of the Hitachi and all the other 19-inch monitors we tested is consid-

Big-Screen Monitors

SHARPEST SCREEN: The 21-inch Cornerstone Color 50/101sf, has a crisp URL (1a) and a bas-relief graphic (1b) showing detail and nuance. At the same 1280 by 1024 resolution on the 19-inch Sampo Alphascan 810, the URL (2a) is blurred and the graphic fairly crude (2b).



Monitors: 19-inch

Cornerstone Imaging Color 45/101sf

83/very good

91/excellent

Iiyama VisionMaster 450*

90/excellent

83/very good

Hitachi SuperScan Elite 751

86/very good

87/very good

Hewlett-Packard M-900

87/very good

82/very good

Dell 1200 HS

79/good

81/very good

Monitors: 21-inch

Cornerstone Imaging Color 50/101sf*

90/excellent

95/excellent

Mitsubishi Diamond Pro 1000

87/very good

90/very good

Sony Multiscan GDM-500PS

82/very good

93/excellent

Iiyama VisionMaster Pro 500

80/very good

89/very good

Princeton Graphic Systems Caliente C2001

81/very good

86/very good

* Best Buy

Top five 19- and 21-inch monitors listed in order of results for each category

ered standard protection, the added (and more expensive) shielding required by TCO provides an extra measure of comfort for those who worry about EMF. Hitachi's warranty is for three years. *Hitachi*, 800/441-4832, www.hitachi.com READER SERVICE NO. 678

5 DELL 1200 HS

PRO: Fine image quality, good control design, round-the-clock support.

CON: Shortest warranty of any monitor on our chart.

For graphics, the \$924 Dell 1200 HS nearly equaled the other 19-inchers on our chart, displaying very good detail and color. On the other hand, text—while generally legible—wasn't as crisp.

Dell's control interface distinguishes this monitor: It combines three buttons—for brightness, contrast, and menu—with a centrally placed roller knob under the front bezel's edge. The brightness and contrast buttons provide speedy access to the most-needed controls, and adjusting them with the knob is quick and intuitive. Our prime complaint is with the stingy one-year warranty. But if you buy this model with a Dell PC, it will be covered under the three-year warranty you get with the rest of the system. *Dell*, 800/289-3355, www.dell.com READER SERVICE NO. 679

Trying to get your head around

AGP?



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3D Performance Comparison - ZD 3D Winbench98

ATI XPERT@PLAY	
8MB AGP	560
4MB AGP	532
STB Velocity 128	
	458
Diamond Viper 330	
	438
Diamond Monster 3D	
	385
Hercules Stringray 128	
	375
Matrox Mystique 220 / Matrox M3D	252
Matrox Millenium II	91.7
Creative Labs Graphics Blaster	72.2

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- NEW Turtle Beach Montego A3D 64 Voice Sound Card
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- 32X Max[^] Variable CD-ROM Drive
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°Personal leasing arranged by Dell Financial Services L.P., an independent entity, to qualified customers; amount of monthly lease payments above are based upon 24-month lease. All above monthly lease payments exclude taxes which may vary (for example, Hartford City, IN sales tax: \$3.45/month based on \$3499); shipping cost due with first payment; no security deposit required; subject to credit approval and availability. Lease terms subject to change without notice.

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 - 6.9 Pounds*
- ★ Inspiron Port Replicator, add \$159.
★ 2nd Smart Lithium Ion Battery, add \$169.

\$3799

Business Lease^o: \$134/Mo., 36 Mos.
Order Code #890321

DELL INSPIRON 3000 M266XT 266MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- Common features listed above plus:
- 13.3" XGA Active Matrix TFT Display
 - 64MB SDRAM Memory
 - 3.2GB ATA Hard Drive
 - 128-bit Graphics Accelerator with 65K Colors at 1024x768
 - Leather Carrying Case
 - MS Office 97 Small Business Edition
 - 6.9 Pounds*
- ★ Upgrade to 96MB SDRAM, add \$199.
★ Upgrade to a 4GB Ultra ATA Hard Drive, add \$99.

\$2999

Business Lease^o: \$109/Mo., 36 Mos.
Order Code #890323

DELL INSPIRON 3000 M233ST 233MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- Common features listed above plus:
- 12.1" SVGA Active Matrix TFT Display
 - 48MB SDRAM Memory
 - 3.2GB ATA Hard Drive
 - 128-bit Graphics Accelerator with 16 Million Colors at 800x600
 - MS Office 97 Small Business Edition
 - 6.4 Pounds*
- ★ Upgrade to a 13.3" XGA Active Matrix TFT Display, add \$200.
★ Upgrade to 80MB SDRAM, add \$199.
★ 2nd Smart Lithium Ion Battery, add \$169.

\$2499

Business Lease^o: \$91/Mo., 36 Mos.
Order Code #890309

DELL INSPIRON 3000 M200ST 200MHz PENTIUM PROCESSOR WITH MMX TECHNOLOGY

- Common features listed above plus:
- 12.1" SVGA Active Matrix TFT Display
 - 32MB SDRAM Memory
 - 3.2GB ATA Hard Drive
 - 128-bit Graphics Accelerator with 16 Million Colors at 800x600
 - MS Office 97 Small Business Edition
 - 6.4 Pounds*
- ★ Upgrade to a 233MHz Pentium Processor, add \$200.
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DELL®

21-Inch Models

1 CORNERSTONE IMAGING COLOR 50/101SF

PRO: Top-notch image quality, buttons give direct access to control functions.

CON: Must press Store to save settings, no convergence or focus controls.



The light-gray, conservatively styled Cornerstone Imaging Color 50/101sf earns our Best Buy with an unparalleled picture: It's the only monitor in our review to win a score of excellent for both text and graphics. Whether you're editing photographs or crunching endless numbers on huge spreadsheets, this \$1535 monitor outperforms all comers.

Details leaped out in our shaded waterway screen, and the colors were rich and vibrant in our photo of fresh fruit. We also noted a fine display of three-dimensional qualities in our photo of Olympic runners and in our photomontage. The smallest text was crisp and sharp—whether we were viewing the fine print in our newsletter or the smallest font on our worksheet.

As with the Cornerstone's 19-inch sibling, we appreciated the way the 12 buttons offer direct access to controls. The controls on both Cornerstones are identical—right down to the annoying idiosyncrasy of requiring you to hit Store to save adjustments.

Unlike the other 21-inch monitors that made our chart this month, the Cornerstone lacks BNC coaxial connectors. For mainstream PC applications, you won't miss them: BNC connectors are used mainly to link up to non-PC image generators, as in flight simulators and other specialized terminals. A more notable omission is the lack of a convergence control. Though it's unusual for an electron gun to drift out of alignment as the monitor

ages, if it happens, you'll have to send the monitor to a service center. Support and warranty match the Color 45/101sf's. *Cornerstone Imaging, 800/562-2552, www.corimage.com*

READER SERVICE NO. 680

2 MITSUBISHI DIAMOND PRO 1000

PRO: Terrific picture, outstanding control interface.

CON: Pricey, has two faint lines across the screen.

The \$1750 Mitsubishi Diamond Pro 1000 is expensive compared with the top-rated Cornerstone, but it delivers the higher-end features that many graphics professionals demand—including a user control for adjusting convergence. For styling, features, or controls, it's hard to find a more elegant monitor. And the Mitsubishi's display is one of the best, with text second only to the number one Cornerstone's. Only the Cornerstone and the Sony Multiscan GDM-500PS outdid it on graphics. Our judges particularly liked its crisp display of the finely etched lines of our engraved image and the way the superimposed photos on our montage screen seemed to float up off the background. As with all large monitors using Diamondtron or Trinitron aperture grille tubes, a close look at a solid white background reveals two faint lines.

Mitsubishi's unique drop-down control panel is attractive and functional, giving easy access to nine well-arranged, clearly labeled control buttons. The controls are complete and intuitive—and closing the panel leaves a clean monitor face. For fine-tuning, Mitsubishi's image-adjustment utility enables you to set your screen geometry and colors precisely. *Mitsubishi, 800/843-2515, www.mitsubishi-display.com* READER SERVICE NO. 681 ►

LEFT: Iiyama's Vision-Master Pro 500.

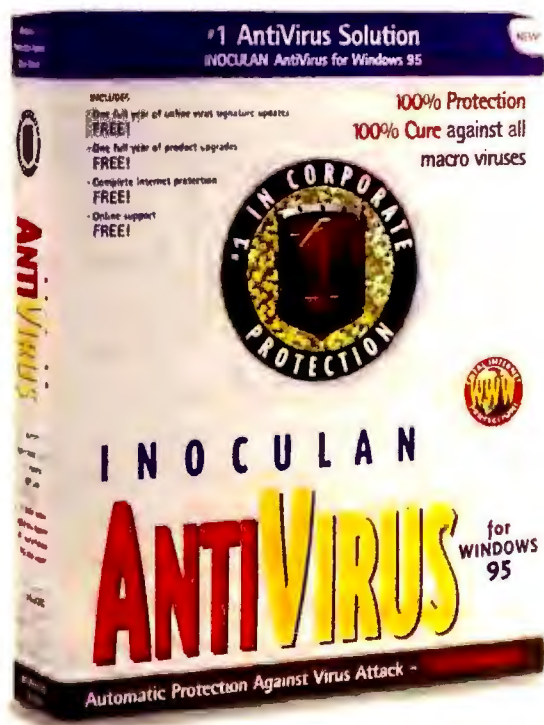
BELOW: Princeton Graphic Systems' Color-C200L

ABOVE: Sony's first 21-inch model, the Multiscan GDM-500PS.

RIGHT: Mitsubishi's Diamond Pro 1000.

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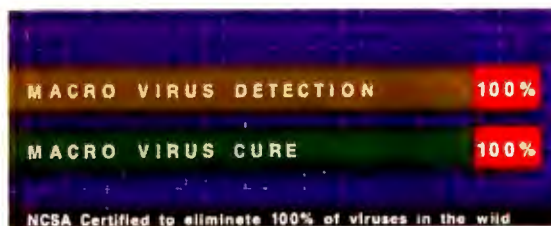
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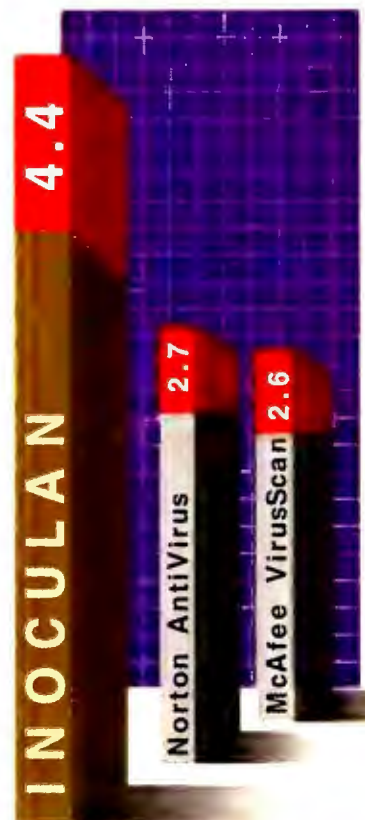
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3 SONY MULTISCAN GDM-500PS

PRO: Excellent graphics, crisp text, intuitive controls, 24-hour-a-day support.

CON: Expensive, two faint lines across screen.

The good-looking Multiscan GDM-500PS incorporates Sony's brand-new 21-inch Trinitron tube—and it's likely to quickly make the company's higher-end 20-inch products obsolete. The \$1799 GDM-500PS has a terrific picture and fine controls. If it were less expensive, it would have earned a higher position on our list.

This Multiscan delivers the image quality that made the first Trinitrons famous—and then some—with lush, true colors that helped our test image of mixed fruit look positively edible. And the GDM-500PS was no slouch when it came to text: It was a cinch to read the fine print in our Web page and newsletter. Sony's controls are well-designed and easy to use: For example, one button lets you reset only the control you're adjusting, and you can position your menu wherever you want on screen.

As we went to press, Sony announced three-year warranties on its new monitors. With round-the-clock support, Sony's policies are now among the best. *Sony*, 800/352-7669, www.sony.com/pc
READER SERVICE NO. 682

4 IIYAMA VISIONMASTER PRO 500

PRO: Fine graphics and text, clean button interface, great price for a 21-incher.

CON: Small viewable area, two faint lines across screen.

Iiyama's VisionMaster Pro 500 provides a fine graphics display at \$1449—inexpensive for a monitor this size. It faithfully rendered a wide range of flesh tones in our Olympic runners test screen, displaying a three-dimensional effect. It didn't quite match our other top contenders for text but still produced a sharp, readable image. Like Iiyama's VisionMaster 450, the VisionMaster Pro 500 has a clean and intuitive three-button control interface.

Iiyama covers its monitors for three years, with 12 hours of weekday toll-free support. *Iiyama*, 800/394-4335, www.iiyama.com
READER SERVICE NO. 683

5 PRINCETON GRAPHIC SYSTEMS CALIENTE C2001

PRO: Fine picture, relatively inexpensive, small footprint.

CON: Buttons look and feel cheap, two faint lines across screen.

Give Princeton Graphic Systems' handsome Caliente C2001 a close look if you want a big screen but lack desk space. This \$1499 model is the smallest 21-incher we tested.

The Caliente performed well: Its text quality is on a par with the 21-inch Iiyama's, and its graphics quality was almost as good. Too bad the controls aren't better designed; the membrane-covered "blister" buttons have a cheesy feel. The menus weren't hard to navigate, though, and there's an ample selection of adjustments.

Princeton offers a three-year war-

ranty, and 24-hour-a-day support is toll-free, though the answer line is automated for 12 hours after 5 p.m. *Princeton Graphic Systems*, 800/747-6249, www.prgr.com READER SERVICE NO. 684



Find more information on additional monitors at www.pcworld.com/april98/monitors. Peter M. Stoller is a Los Angeles-based author and consultant.

For more information on all products in this article, circle reader service no. 906.

The Lowest-Cost Jumbo Screens

PROBLEM: Your meeting room is plenty big, but your 17-inch monitor's unreadable to anyone more than 10 feet away. Or you gather the family for a round of You Don't Know Jack—but only a few of you can sit comfortably and still read the PC screen.

SOLUTION: Replace the monitor with a jumbo screen that combines inexpensive TV design with monitor technology. For example, Princeton Graphic Systems' \$1499 Arcadia AR3.1AV—the first product you can hook up directly to either a PC or a TV feed—costs no more than many 21-inchers yet has a huge 31-inch viewable area. We found it performs well with a PC for presen-

tations or gaming, and it can also replace a TV if you plug it in via an RCA or super-VHS port or hook it to a cable, VCR, DVD, or other video source. (To switch TV channels, you'll need a cable box or DSS tuner.)

To evaluate the Arcadia, we ran it through our Top 10 Monitor tests, took it home and hooked it to cable to watch *NYPD Blue*, connected it to a Toshiba DVD player to view *Under Siege*, then attached it to our home PC to play Streets of Sim City.

Don't expect to use this 128-pound behemoth for word processing: Recommended viewing distance is 8 to 20 feet. Closer, its .92 stripe pitch emits so much light, you see pixelation and flicker even at its highest refresh rate—75 Hz at 640 by 480 resolution. Large, thick presentation fonts and color graphics look good, but fine print does not.

TV shows and DVD movies looked better than on a TV: The Arcadia doubles the normal TV scan rate and provides a crisper noninterlaced image. Fast-paced games took on an almost-overwhelming, cinematic quality.

The Arcadia has a shorter warranty than most monitors (a year, including on-site service). Princeton Graphic Systems; 800/747-6249; www.prgr.com.

READER SERVICE NO. 685



Intel Tech Buzz

FLEXIBLE ARCHITECTURE

Delivering flexibility for the future.

The pace of change continues to accelerate. Yesterday, companies were networking their PCs and putting groupware solutions in place. Today, connectivity is moving beyond the corporate walls. Tomorrow, businesses may rise or fall on the strength of their computer linkages to key suppliers and customers.

To survive in a world of rapid change—or, better yet, to exploit it for competitive advantage—the key is flexibility. Even if no one can predict precisely what tomorrow's business computing solutions will look like, companies know they'll need to adapt and deploy them quickly, without obsoleting their current infrastructure or impacting their current ability to solve problems.

To maintain that flexibility as they expand into uncharted territory, many businesses are basing their computing infrastructure on the Intel Architecture (IA).

By choosing clients and servers based on Intel's Pentium® II, Pentium® Pro, and Pentium® processors with MMX™ technology, companies can build a robust, cohesive environment that provides power and consistency from the desktop to the data center. This common infrastructure, coupled with new Wired for Management technologies and a scalable network architecture, enables companies to deploy new capabilities quickly, yet preserve current solutions. Performance can be added where and when it's needed, easily and cost effectively.

An Intel-based environment also offers the flexibility to match the computing model to the task at hand. Whether the business challenges

intel®

What's the Buzz?

"Intel-based servers deliver power and scalability to SAP R/3 customers at unprecedented price/performance levels. Because Intel servers are the platform of choice for so many of our customers, we optimize our products for top performance on the Intel architecture."

Dr. Hasso Plattner,
Co-Founder/Vice Chairman,
SAP

"Working closely with Intel to take advantage of its platform and processor expertise allows us to deliver Oracle products on an architecture optimized for network computing. Oracle8, the Database for Network Computing, and Intel's Pentium processor family will provide an outstanding computing platform for business solutions."

Gary Bloom,
Senior Vice President,
System Products,
Oracle Corporation

"We are enthusiastic about the introduction of Intel's new IA-64 processor family. We expect the combination of PeopleSoft and the IA-64 architecture to bring our customers additional power and scalability."

Stan Swete,
Vice President,
PeopleTools
Product Strategy,
PeopleSoft

intel®

demand three-tiered client/server solutions, network-centric Java*-based applications, or Internet-enabled line-of-business programs, the Intel Architecture lets companies give each user or department the solutions they need.

Adding further flexibility, Intel-based platforms are supported by the industry's widest selection of software tools, applications, and add-ons. The economics of the volume marketplace ensure that emerging solutions will likely be available first and with the greatest range of choices on the Intel Architecture.

In times of rapid change, one of the biggest mistakes is to choose a strategy today that limits flexibility tomorrow. By relying on the Intel Architecture as they build their computing infrastructure, businesses can pave a smooth path to the future—wherever the future takes them.

Today's servers: flexibility in action.

The power and versatility of Intel's processor family allows companies to create a cohesive environment that spans lean clients to departmental, application, and database servers. That environment can evolve to meet tomorrow's business requirements without disrupting what works today.

Case in point: Intel-based servers are already running 24x7, business-critical, transaction-oriented applications around the globe. Not only are the majority of file/print and workgroup servers based on the Intel Architecture, but scalable Intel-based servers are delivering reliable, cost-effective computing to the glass house as well. According to SAP, for example, 42% of all new SAP R/3* installations are on Intel-based systems.

Intel's industry-leading commitment to developing next-generation platforms will provide a smooth transition to higher performance while maintaining existing infrastructural investments. Advances in high-performance scalable server clusters and I/O will push performance even higher, as will Intel's forthcoming 64-bit microprocessor architecture. The IA-64™ architecture maintains its compatibility with Intel's 32-bit processors, and dozens of software companies are already tuning their tools and applications for top performance on the next-generation processors.

For clients, servers, and networking solutions, such as Fast Ethernet and Gigabit Ethernet technologies, Intel delivers the performance and flexibility to keep companies on the leading edge, today and tomorrow.

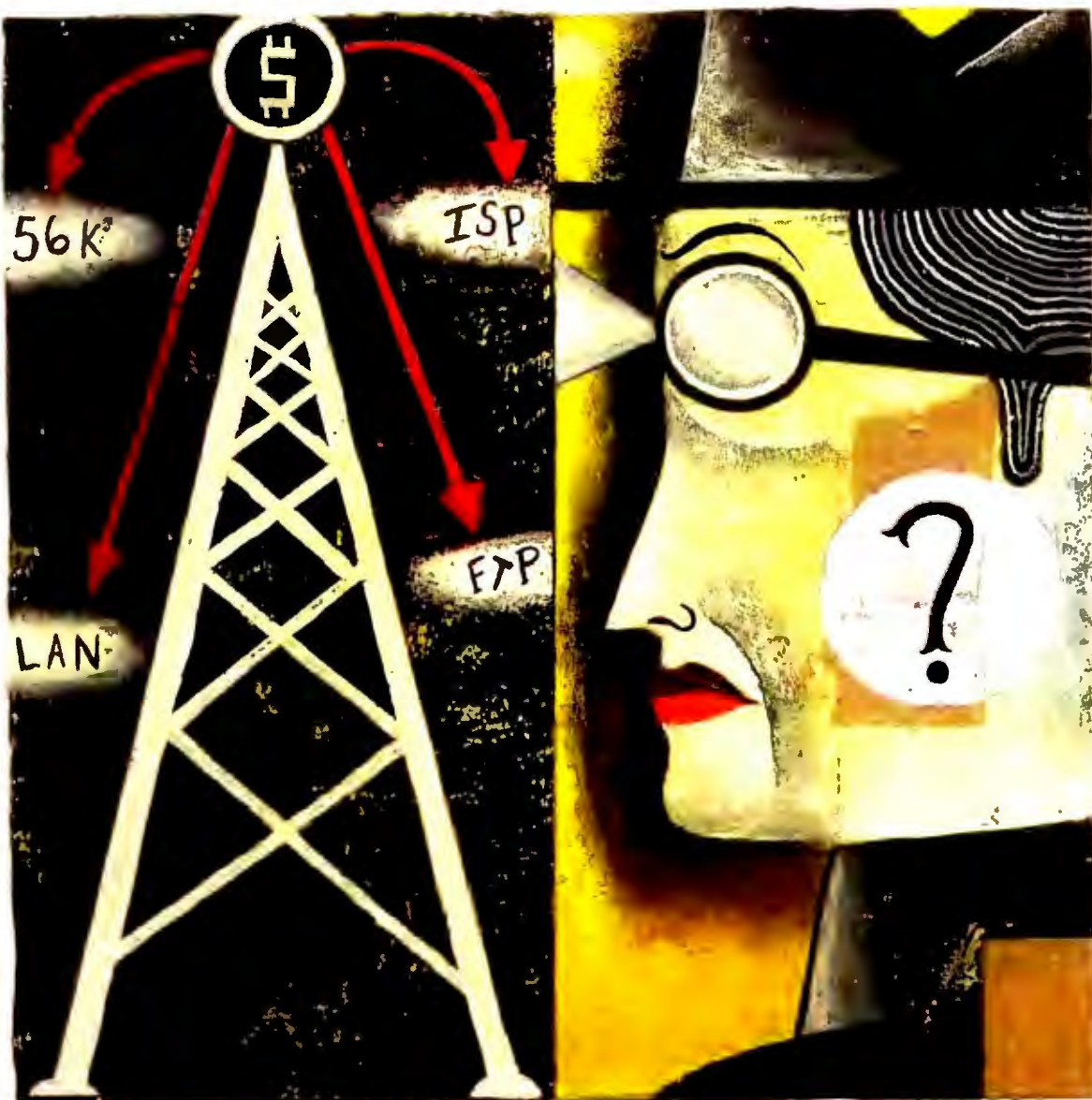


Do You Have
All the

Small
Office
Home
Office

Internet

You Need?



Bandwidth **options**, ISP

choices, hardware

purchases. Here are the best

solutions for getting your

business on the **Web**.

BY KIRK STEERS

CHRIS DIXON loves to surf. And so does the rest of the staff at *Surfer* magazine, based in San Juan Capistrano, California. When it became obvious that they needed to surf the Web as well as the waves, online editor Dixon was faced with a dizzying array of decisions to be made. ►

COSTS TO CONNECT, FROM SIMPLE SETUP TO BIG-TIME OPERATION

IF YOUR COMPANY HAS...	Internet needs	Recommended bandwidth option	Hardware required	Type of ISP account	Start-up cost ¹	Monthly maintenance cost ²
1 to 4 employees, no network	e-mail, occasional Web access	standard phone lines	33.6-kbps or 56-kbps modem for each PC	basic	\$25 to \$100 plus \$120 modem	\$20 to \$80
	e-mail, fast Web access and file transfers	ISDN	ISDN adapter	ISDN	\$175 to \$400 plus \$250 modem	\$100 plus per-minute charges
5 to 15 employees, networked	e-mail, Web access, Web site hosted by ISP	standard phone lines	analog modems, e-mail server	basic account plus Web hosting	\$100 to \$300	\$100 to \$500
	e-mail, fast Web access	ISDN	access-sharing ISDN adapter and router, e-mail server	ISDN LAN	\$1450 to \$1650	\$100 to \$500
more than 15 employees, networked	e-mail, lots of Web use, Web site with commerce hosted on-site	frame-relay or fractional T1 line	router, CSU/DSU (T1 modem equivalent), high-end server	dedicated leased-line account	\$5500 to \$26,000 ³	\$500 to \$2500
	e-mail, lots of Web use, Web site with commerce hosted by ISP	ISDN	ISDN router, e-mail server	ISDN LAN	\$1750 to \$21,400 ³	\$500 to \$2500 for line plus \$500 for Web site

¹ Includes estimated costs of phone service, hardware, and ISP accounts.

³ Cost of designing Web site can range from \$500 to \$20,000 or more.

² Includes estimated phone and ISP charges.

The single America Online account he and the staff were using was "woefully inadequate," says Dixon. "We needed e-mail for everyone and a more convenient, reliable connection."

But how much more did they need? Access to the Internet for research? A good idea. Their own Web site to promote the magazine? Sure, if it wasn't too expensive. An online payment system so they could sell regional surf reports? Whoa, dude—could they do that?

"We were blown away by all the choices," Dixon says.

Small-business owners everywhere are asking the same question: What's the best way to hook up to the Net? Lots of factors determine the answer, but it really comes down to how much Internet you need.

A small two-person office that needs to send and receive e-mail and roam the Web has vastly different requirements from a 20-employee company with plans to sell products over the Net. Finding an Internet service provider takes some digging, and costs run from a few dollars for a single e-mail account to hundreds a month for multiple-user accounts with a full range of Internet features. Simply put, the more data you want to move, the more it will cost you. So you need to choose wisely.

In these pages, we'll look at three small-business scenarios with different Net needs. Whether you're a one-person start-up, a small networked office, or an established firm with a staff of 30 looking to sell your wares online, we'll help you find the

right hardware, bandwidth options, and ISP. Along the way we'll identify products that can make your life easier—and maybe make your business more profitable.

SCENARIO 1

Bare-Bones Internet



"I USE THE WEB for research, to look up financial information on companies, and for networking with colleagues," says David Kaufman, a market research consultant in Boston. He uses a Pentium-60 desktop with a 33.6-kilobits-per-second modem and a P-120 laptop with a 28.8-kbps modem—not as fast a setup as he'd like, but "it gets the job done."

Kaufman works out of his small office and connects to the Net via AOL and The Internet Access Company, a local ISP. He's living proof that if your online needs are moderate, you don't need the latest, greatest hardware to get value from the Internet.

If your business is small, if you want to connect only a few PCs to the Net, and if you're interested primarily in e-mail and Web access, don't be afraid to think small. There's no need to spend a bundle on fancy hardware and high-powered connections—a simple ISP account and a modem will suffice.

THE OLD-FASHIONED WAY

INTERNET CONNECTIONS are measured by the maximum speed at which your computer can soak up data from your ISP.

If your business PCs are already connected to the Net, you're probably using a 28.8-kbps or 33.6-kbps modem and a standard analog telephone line. That's more than enough speed for e-mail, but for comfortably downloading pages from the Web, you'll want more juice. You'll be better off with a 56-kbps modem. Most 56-kbps modems download files about 50 percent faster than 33.6-kbps models and cost around \$120 to \$250.

If you use two analog phone lines in your office, one for data and one for voice, there's a new option for speeding up downloads that should be available by the time you read this. Diamond Multimedia has developed Shotgun, a software technology that lets you combine the bandwidth of your voice line, or of any additional line, with that of your existing data line to (theoretically) double your throughput. And it's smart enough to release the voice line for incoming or outgoing phone calls.

The catch is, you need a modem for each line, with two open connections to the ISP, and your ISP must support the technology. Although Shotgun will work with any modem, Diamond has developed a two-in-one modem, the SupraSonic II. See this issue's *Top of the News* for an explanation of how Shotgun and competing technologies work.

Of course, attaining your modem's full rated speed depends heavily on the quality of your local telephone lines, some luck, and which way the wind is blowing.

To get a clearer signal and a faster (and much more expensive) connection, you'll need to go digital.

THE ISDN FAST LANE

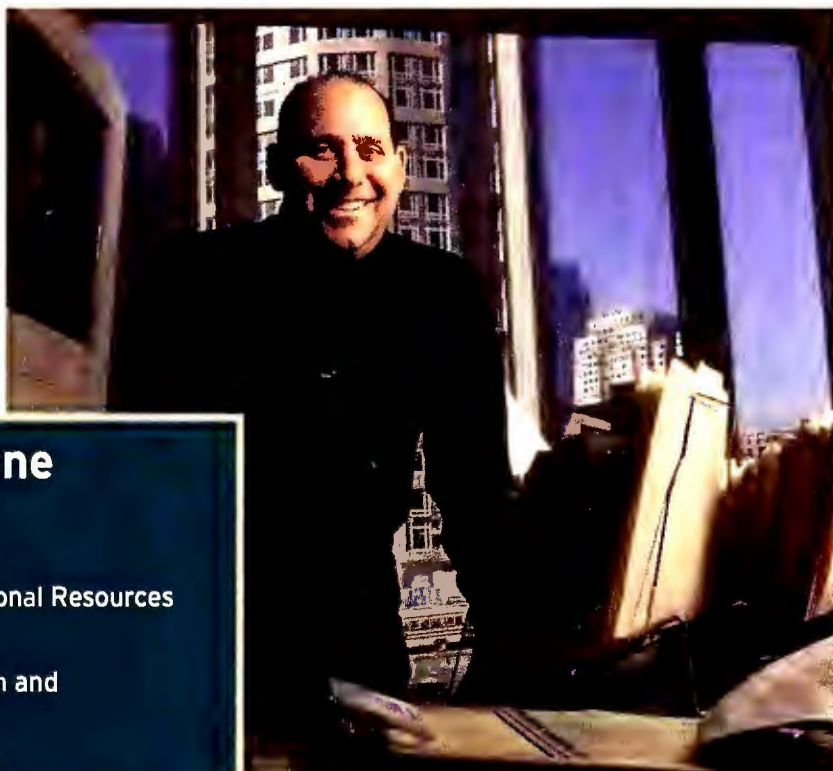
COMPARED TO AN ANALOG modem, a digital connection such as ISDN is blazingly fast. The 64-kbps and 128-kbps speeds ISDN makes possible may not sound that much faster than analog speeds, but thanks to the higher quality of the digital signal, the download times are two to three times faster than those of analog modems.

But that speed doesn't come cheap. You'll need to buy extra hardware and pay more for phone services and ISP connections. For most small offices with no internal network and only a few computers, ISDN is overkill.

The exception? You may want to consider ISDN if you routinely transfer large files such as graphics or drawings. Architecture firms, graphic design companies, and other businesses that routinely send and receive large files will certainly benefit from ISDN's faster connections. So will people who plan to log on remotely

to a network or to do videoconferencing—both common tasks for telecommuters.

To connect an ISDN line to a single computer, you will need an ISDN modem (also



Internet for One

Name: David Kaufman

Title: president

Company: Allied International Resources

Location: Boston

Business: market research and consulting

Number of employees: one

Internet needs: e-mail, Web research

Internet solution: P-60 desktop PC, P-120 notebook, 28.8-kbps modem, dial-up accounts with TIAC (a local service provider) and America Online

called an ISDN terminal adapter). Like an analog modem, an ISDN terminal adapter snaps into a free slot in your system or attaches to an external serial port. Prices start at around \$250.

You'll also have to set up a special account with your phone company. ISDN runs on the same lines that your telephone uses, but you'll need a new jack installed, which runs anywhere from \$80 to \$200. Monthly rates for ISDN service typically carry a fixed charge that ranges from \$35 to \$120, *plus* a per-minute charge for connect time. You can subscribe to a single 64-kbps channel, or combine two channels for a 128-kbps ►

Selecting an ISP Is Bigger Better?

NO MATTER WHAT your company's size, one of the most important steps you'll take in connecting to the Internet is choosing an Internet service provider.

ISPs come in three sizes: national, regional, and local. And bigger isn't always better—many local and regional ISPs offer competitive prices, superior performance, and better technical support than their nationwide competitors. (See "ISPs You Can Count On" in the January issue for comparative test results.)

Smaller ISPs are also more accessible. An expanding business will have changing online needs and growing pains; a good customer relationship with a local ISP can make a huge difference when you're trying to solve a sticky technical problem.

So what's good about the bigger ISPs?

Bandwidth. The AT&Ts, MCIs, and Sprints of this world have huge networks with

superfast data "backbones" that link different regions of the country. Making your connection to the Internet through one of those companies means that you have quick access to these digital superfreeways.

If you do opt for a local or regional Internet service provider, make sure that it's well connected. All of the major networks meet at a handful of network access points throughout the country. The more hops your data has to make to get onto a backbone, the slower

your service is going to be. Ask if the ISP has a fast connection to one of these access points. And the more backbone connections it has, the better.

Look for a local ISP that will be around for a while. "There is a shakeout of smaller ISPs," says Todd Hadrich, an analyst with Jupiter Communications in New York. "Pick an ISP with good service and a professional image;

they're more likely to be acquired by the bigger players." Also choose an ISP whose customer service is rated highly.

If all you need is e-mail and Web access for a few PCs, you'll probably get a better deal with local or regional providers. If

you have big plans for a sophisticated Web site and online commerce, you may benefit from one of the larger companies. Big or small, you just need to find the right fit.



data rate, although it will cost more. If you use two channels, you can phone or fax while connected to the Net.

You've probably heard some of the horror stories about getting an ISDN line installed. Mark Sample, a developer of high-tech consumer products, had such a tale. The reason: "Bell Atlantic subcontracted out all the installation service." He recalls that when he had ISDN installed in his home office for his work with Ground Zero Technologies in Reston, Virginia, "instead of one man coming to the house and setting it up, three different people came at three different times."

But all that happened more than two

such as Web access, e-mail, and access to Usenet newsgroups, so choosing which company to go with is primarily a matter of preference or taste. (See "ISPs You Can Count On" in the January issue of *PC World* for our recommendations.)

But for more than three users, \$19.95 per person plus the cost of a phone line can add up pretty quickly. Some service providers, such as MindSpring and EarthLink, will let you add additional mailboxes to a single account—usually for around \$5 a month. And for an extra per-hour fee, many ISPs let more than one person log on simultaneously. MindSpring, for example, charges \$1 to \$2 an hour, depend-

ing on the plan, while EarthLink does not offer this service.

Of course, some of the service providers prefer to steer their business users toward more comprehensive (and more expensive) Web-hosting accounts; these companies open



years ago. For many people, getting ISDN isn't the chore that it used to be. Demand for ISDN over the past year has pushed the telephone companies up the learning curve. The way Sample sees it, "the days of having to be a rocket scientist to install it are over."

Is ISDN worth it? Very definitely, says Sample. "For any graphics, video, or audio person, it's a lifesaver."

AN ISP OF YOUR OWN

FOR A NONNETWORKED office that has two or three people using analog modems, getting an ISP account for each user may be the simplest solution, and the cheapest. Most ISPs have a \$19.95-per-month plan that provides unlimited connect time and all the standard features,

Networks of Art

Name: Gordon Whiting

Title: chief operating officer

Company: Berkeley Mills

Location: Berkeley, California

Business: manufacture of finely crafted wood furniture

Number of employees: 10 in office using Internet, 20 in manufacturing

Internet needs: e-mail, product brochure on the Web

Internet solution: ISDN line, LanMinds (a local Internet service provider)

their \$19.95 unlimited access plans only to individuals and families.

If you've got ISDN, you'll need to find an ISP that offers digital access in your area. PC World Online's ISP Finder can help you (www.pcworld.com/apr98/isp_finder). Expect to pay an extra \$40 per month for the higher-speed connections. Fortunately, establishing an ISDN account with your ISP is no different from starting an analog account; it's all done by voice over the telephone.

SCENARIO 2

The Networked Office



"A BEAUTIFULLY made table must be seen to be truly appreciated," says Gordon Whiting, chief operating officer of Berkeley Mills, a maker

of fine hardwood furniture in Berkeley, California. "We saw a Web site as a potentially more persuasive medium than mail order for generating sales."

For the past year Gordon has overseen his company's successful push to develop an Internet presence as well as an e-mail link for communicating with its branch factory in Santa Fe, New Mexico—but not without a few snags.

The firm's first ISP was unreliable and offered no help when staffers had questions. But he hit pay dirt on the next try with LanMinds, a small local ISP and network consultant. "We installed an ISDN router with no trouble," says Whiting, "and when an obscure FTP problem kept our Web page developer from loading pages to our site, LanMinds worked on-site with the developer and another consultant for four hours until the problem was solved."

HOOKING YOUR NET TO THE NET

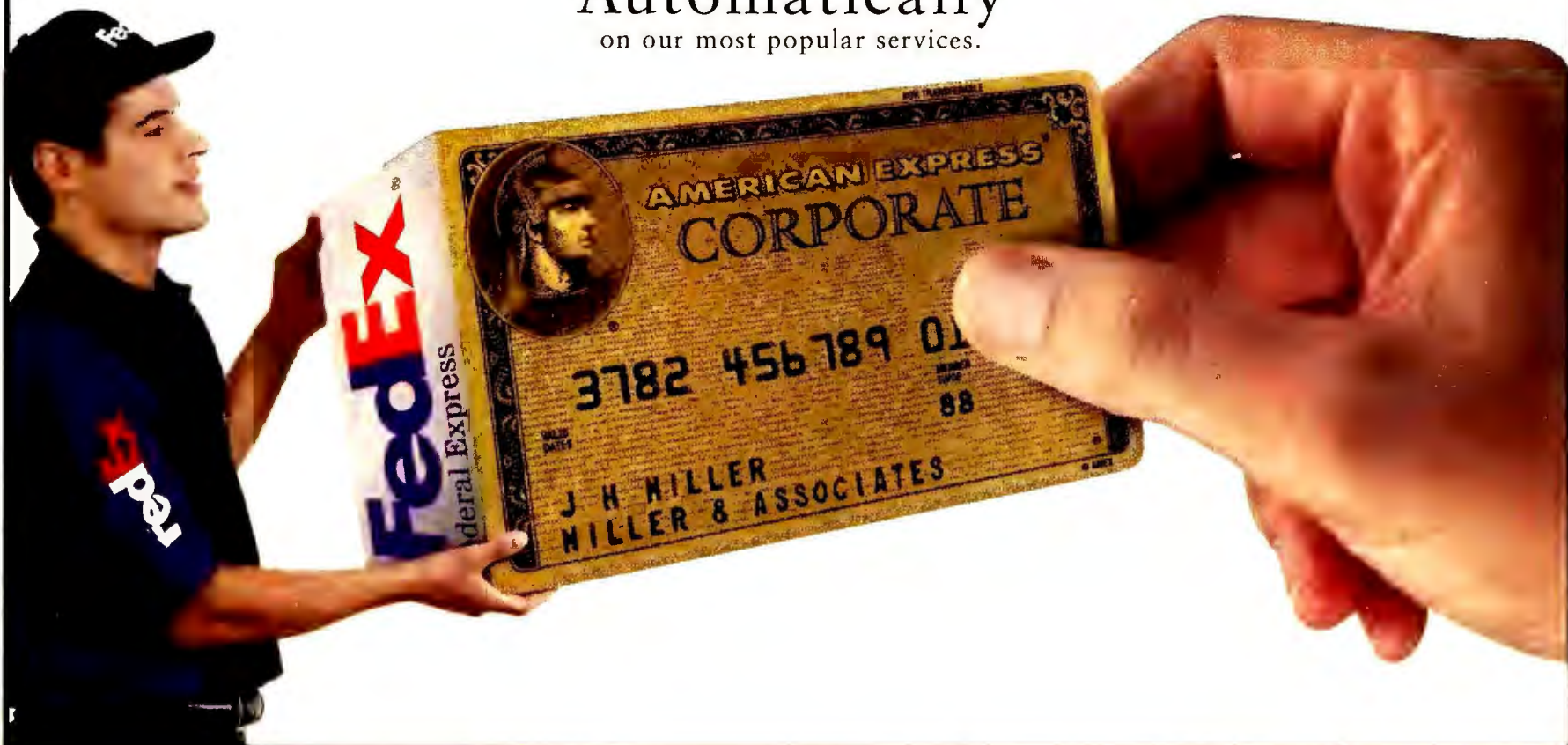
GETTING A SMALL office of five to ten people onto the Internet is simplest when each user's PC is linked with a local area network. Let's say you want Internet and in-house e-mail, comfortable Web-surfing capabilities, and a company Web page. By making a single connection to your ISP, a LAN lets you avoid the costs and hassles of separate online accounts and phone lines for each PC.

Once you've got a network, what else do you need? If only five or six of your users surf the Net regularly, there are several products that will let them share Internet connections using existing analog phone lines rather than a pricier ISDN line.

Artisoft's **I.Share** provides simultaneous Internet access to everyone on your network using only one connection, eliminating the need for multiple accounts. Simply install the software on any computer on the LAN, and a modem hooked to that PC connects to the ISP. **I.Share** ►

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costs \$249 for 12 sessions (Internet applications being run simultaneously). You can download a trial version at www.artisoft.com.

Think one measly connection might not do the job? **MidPoint Gateway** from Mid-Core could be the answer. This \$299 software package provides an Internet connection simultaneously to all users on the network. But it combines the bandwidth of two modems to do the job, speeding up Web page downloads, file transfers, and other Net traffic. And it does this independent of your ISP. The only catch is that you'll need a separate ISP connection—and a separate account—for each modem.

You can install both I.Share and MidPoint on any networked PC. That system can function as a workstation while simultaneously accessing the Web, but heavy traffic may slow it down. And if that PC crashes, so does your Internet connection. These programs are best suited for use on a dedicated PC, or for users with smaller networks and casual Net needs.

If you don't want to tie up a whole PC, one alternative is the \$439 **WebRamp M3** from Ramp Networks. It's a little black box that connects to your PCs through the same 10Base-T wires that make up an ethernet network, and it even includes a four-port hub (the common connection point for all computers on a network). But the WebRamp's main function is to control data traffic between your ISP and network using an analog modem.

WebRamp M3's advantage is that it can handle up to three modems at once, theoretically tripling the speed of your connection. And more than one user can log on to the Internet at a time using that hyped-up connection. But the increased download speeds apply only to documents saved in HTML and other data formats that can be carved up easily into separate data streams. Downloads of graphics files and spreadsheets, for example, won't benefit. And since each modem logs on with the ISP separately, you

may have to pay additional connection fees. But given the hundreds of dollars a month you'd pay for a LAN-based ISDN account, you'd still save money.

ISDN FOR EVERYONE

IF YOU'VE GOT more than, say, five people who need constant Net access, you'll want to harness the higher speeds of an ISDN connection. But with a server-based

or peer-to-peer network, an ISDN modem alone won't do.

You'll also need an ISDN router to connect the network to your ISP.

A router works as a digital post office, sorting all the incoming and outgoing e-mail, Web pages, and other data and preparing them for delivery.

Expect to pay \$500 to \$1000 or more for a router from one of the better-known

vendors. The **Netopia 635**, for example, costs around \$800 and comes with a phone or fax connection.

But your router isn't smart enough to separate and deliver individual e-mail messages from the batch to each recipient. To do that, the LAN must be running an e-mail management program, more commonly known as an e-mail server.

Make sure the e-mail server is compatible with the SMTP format that Internet mail uses; **Eudora Worldmail Server 2.0** (\$159 for ten users) is an example. An SMTP-compatible server can automatically recognize and deliver e-mail formatted for travel over the Internet. If you have an in-house server that's not SMTP compatible (like Lotus's cc:Mail), you'll need to buy and install an Internet mail gateway program that translates Net e-mail to and from that system's protocols.

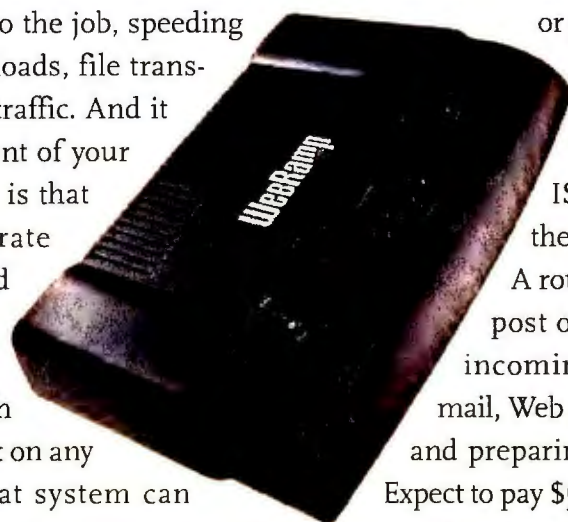
Another option for the small company with limited in-house MIS support is the \$1995 **InterJet 100** from Whistle Communications. It looks like a toaster and has a mail server, Web server, and router all built in. Sold through over 150 participating ISPs, the InterJet 100 is configured before you receive it to work with your ISP. So setup just means plugging it in

and typing a simple initialization code that your ISP gives you.

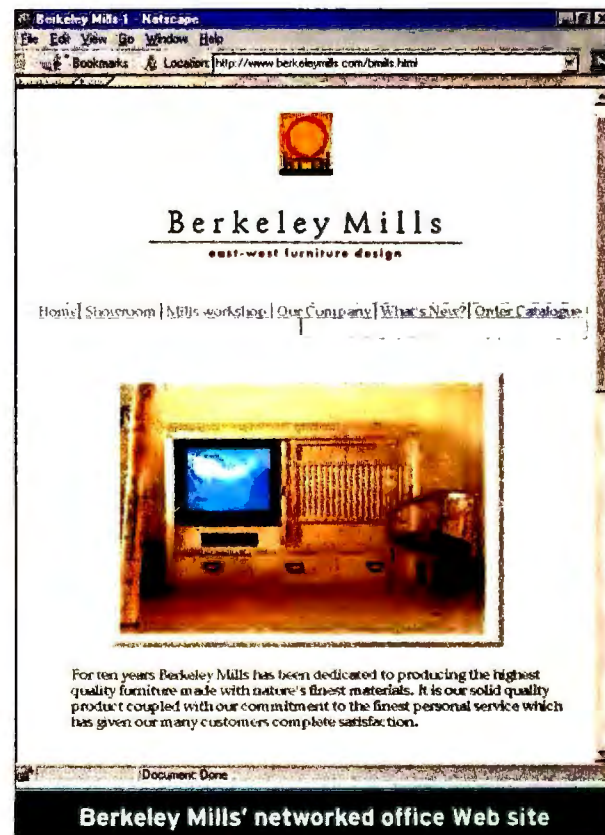
You'll also need an ISDN LAN account with your telephone company. Pacific Bell, for example, offers one for \$400 a month. And if your phone company wants to sell you a router and install it, consider the offer: The company knows what works best with its lines—as well as the best way to install it.

HANGING YOUR E-SHINGLE

WHEN IT COMES TO building your company's first Web site, choosing the right ISP becomes even more important—you want one that will host the site and help you maintain it. Just about every ISP, from AT&T to the guy above the local 7-Eleven, offers a different Web-hosting package. At the low end, most ISPs have a basic account, like EarthLink's Startersite package that includes Internet access and a 10MB plot of Web space for \$19.95 per month. If you want help building and maintaining your site, there's also the



WebRamp M3, a Net-access alternative



Basic Business Website package, which starts at \$89 a month for 15MB of disk space and climbs to \$289 per month for 100MB. (If you want fancy graphics or interactive features like searchable databases, you'll need at least 25MB of space.)

Some packages, such as Concentric Network's \$39.95-per-month Small Business Service plan, will throw in a cus- ►

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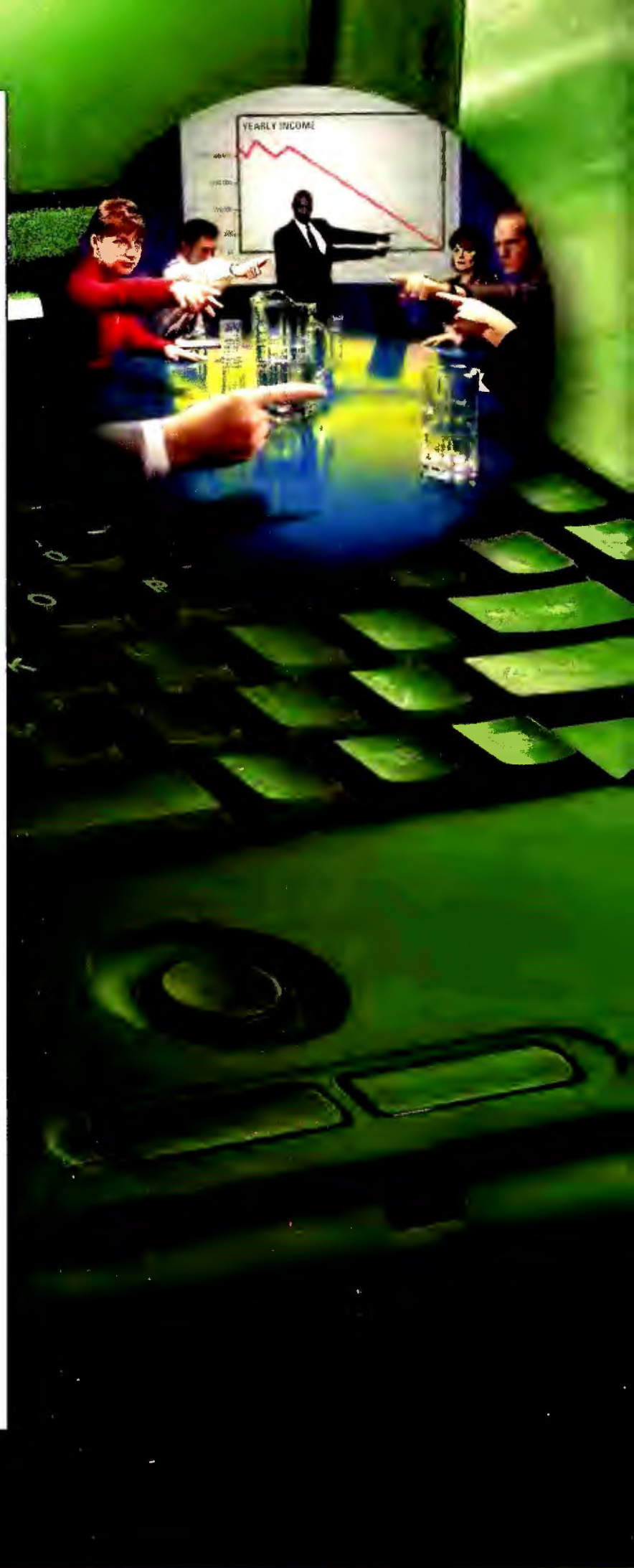
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Finally, someone has to design your site. Unless you (or someone in your company) have lots of free time and loads of programming experience, I recommend getting expert help. Some ISPs offer Web site design as part of a premium package. Bell Atlantic, for example, will get you up and running with a basic graphics-and-text Web site for \$500. Designing more-sophisticated sites can easily cost many tens of thousands of dollars.

SCENARIO 3

Doing Business on the Web



"WE WERE THE creative force, with no clue about the technology," recalls Whitney Moss, technical coordinator at Reel.com.

A virtual video store that started on the Web last April, Reel.com moved to the "real" world last July with the opening of its first retail outlet in Berkeley, California.

In three months Reel's handful of employees had expanded to become a staff of 35. And because the company was doing online commerce from day one, its online needs, and its technical problems, changed daily. That's why Moss says it's vital to hire good technical people and develop solid, long-term relationships with them. "In a fast-growing company," she says, "independent consultants can often do more harm than good. You always need something changed. And when they're gone, they're gone."

HITTING THE BIG TIME

IF YOU PLAN to put more than 20 users on the Internet, need a big Web site with online sales capabilities, and want the site in place yesterday, the most crucial piece of advice is to get good help. If you can't afford to put a qualified Webmaster on staff, you may have no choice but to hire a consultant. And finding a good consultant is like finding a good dentist: The safest approach is to ask people you trust for their recommendations—or you could be in for a world of pain.

You need solid advice when weighing all the options for types of connections, hardware, and electronic commerce packages. Your biggest decision: whether to go it alone, maintaining hardware and Web operations on-site, or to keep everything on an ISP's server and conduct your business through a



The InterJet 100 might be all you need.

ready-made (or *turnkey*) Web-hosting and electronic commerce package.

For newcomers, the solution is clear: Stick with the ready-made route. Turnkey applications and hardware will save you money while you get your feet wet.

MORE SPEED MEANS MORE MONEY

IF YOU HAVE both the inclination and the finances to host your own big, high-traffic Web site, you're going to need an

even faster Net connection, along with some pricey hardware.

The next step up from ISDN is a dedicated leased line that's always connected to your service provider. Leased lines sizzle; a T1 connection allows transmission speeds of up to 1.5 megabits per second, more than ten

times faster than ISDN. But the price of a leased line can be as dizzying as its speed.

Just installing a T1 line runs into thousands of dollars, and monthly fees can exceed \$1000 as well. You'll also need a router and a CSU/DSU (the T1 equivalent of a modem), which will cost another \$2000 to \$5000. And obviously, a high-powered site needs a high-powered computer—whether it's a Pentium Pro PC or a high-end Sun workstation—with lots of memory and storage. ►



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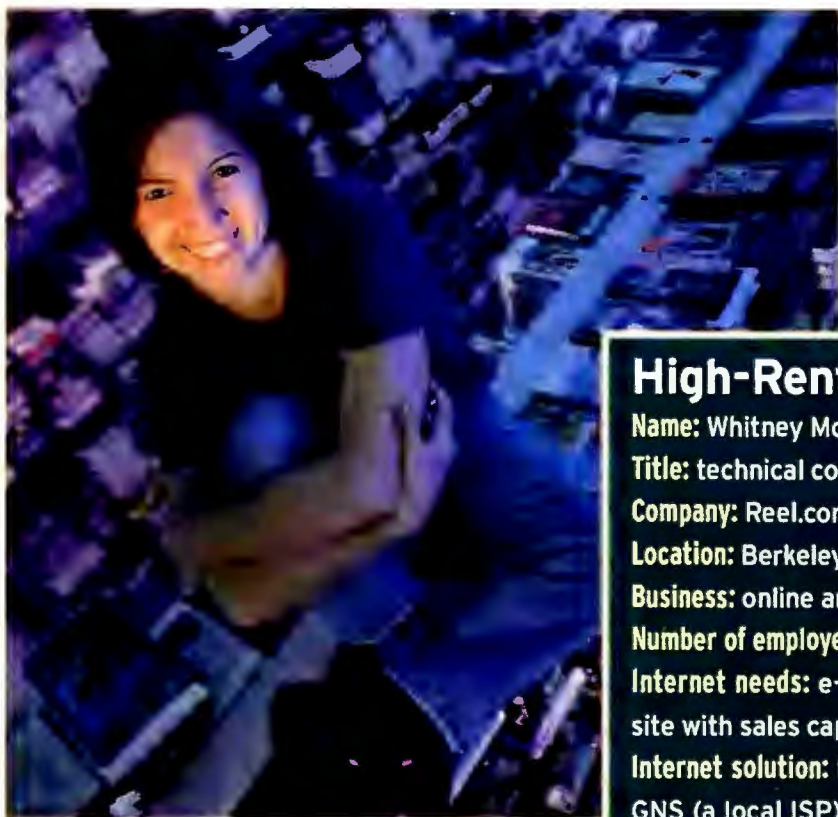
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if you sell products on your site—another good argument for letting someone else host your site.

Also, keep an eye

its variants, including ADSL and HDSL, is a new digital technology that uses existing copper-wire phone lines to deliver high-speed data. Cable Internet access and xDSL are still in their trial stages.

E-COMMERCE ON THE CHEAP

WITH MORE merchants and consumers becoming comfortable with the online world, and software becoming more secure and user-friendly, setting up shop on the Internet has never been easier for a small business. But it's still expensive—so before you leap, look closely at the costs and make sure they're justified.

Setting up a Net commerce system on your own used to mean licensing expensive software like ICat's \$3495 **Pro Commerce Publisher 3.0**, hiring developers to build a storefront, and linking it with credit card verification and payment systems like Cybercash and Veriphone. Combined with hardware and connection costs, the bill could run into the tens or even hundreds of thousands of dollars. ►

High-Rent District

Name: Whitney Moss

Title: technical coordinator

Company: Reel.com

Location: Berkeley, California

Business: online and retail video rentals

Number of employees: 35

Internet needs: e-mail, a high-volume Web site with sales capability

Internet solution: for office, full T1 line from GNS (a local ISP); for Web site, full T1 line from Best (a local ISP)

So unless you're expecting very heavy traffic on your Web site or have more than 30 employees who constantly upload and download large files, it's not worth forking over the big bucks for a leased line.

"Many small businesses are sold a T1 line that they don't need," says Drew Taubman, managing director of the Washington, D.C., and Philadelphia offices of U.S. Web, a Web-hosting solutions provider. "Unless your small company has exceptional demand, a fractional T1 or frame-relay connection should suffice."

As their names imply, *fractional T1* and *frame-relay connections* offer a fraction of a T1 line's speed, starting at 56 kbps and rising incrementally to match the T1's 1.5-mbps throughput. For example, a 128-kbps frame-relay connection from Pacific Bell costs \$1650 to set up and \$795 a month, compared to a full T1 line, which costs \$2900 to set up and \$1895 per month. Prices may vary depending on where you live. Once a 128-kbps line is in place, you don't need to add more hardware to get more bandwidth; you can activate the higher speed with a phone call—for a price.

By comparison, the same company offers an ISDN LAN line—it also runs at 128 kbps—for a \$400 setup fee and \$400 per month. So why pay more for a leased line when ISDN is so much cheaper? Leased lines provide a continuous connection to the Internet for Web servers located at the business. A 24-hour connection and an on-site server are a must

open for new high-speed technologies. Cable Internet access, which pipes the Net into your office through two-way cable TV lines, is slowly becoming available around the country. And xDSL, better known by

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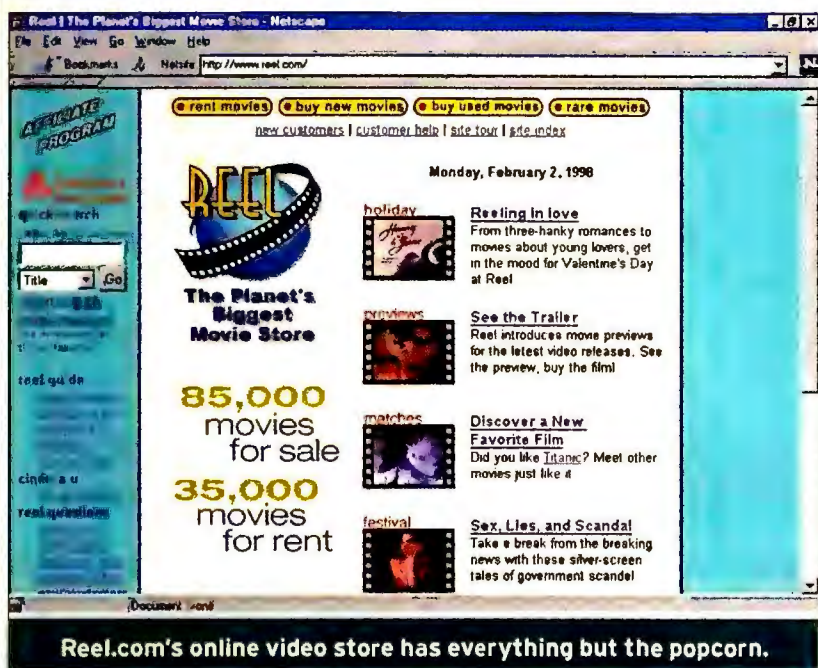
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READER SERVICE NO. 718

MidPoint Gateway \$299 list for 5 users, MidCore, 800/673-6274, www.midcore.com

READER SERVICE NO. 719

Netopia 635 \$800 street, Netopia Inc., 510/814-5000, www.netopia.com

READER SERVICE NO. 720

Pro Commerce Publisher 3.0 \$3495 list, ICat, 888/289-4228, www.icat.com

READER SERVICE NO. 721

SecureBuy \$500 setup, plus \$395 to \$595 per month for 500 transactions; AT&T WorldNet, 800/746-7846, www.att.com/easyccommerce

READER SERVICE NO. 722

SupraSonlc II \$200 list, Diamond Multimedia, 800/468-5846, www.diamondmm.com

READER SERVICE NO. 723

ViaWeb \$100 a month for 50 items, \$300 for 1000; ViaWeb, 888/484-2932, www.viaweb.com

READER SERVICE NO. 724

WebRamp M3 \$439 list, Ramp Networks, 888/493-2726, www.rampnet.com

READER SERVICE NO. 725



Sign up for the ISP that's right for you. Take a look at PC World Online's ISP Finder at www.pcworld.com/apr98/isp_finder. Kirk Steers is a contributing editor for PC World.

For more information about all products in this article, circle reader service no. 708. ■

Our advice? Don't bother. Many ISPs (mostly regional and national) offer much cheaper commerce packages. AT&T WorldNet's **SecureBuy** service, for example, works with business Web sites hosted by AT&T. With the service, visitors can complete slick, secure credit-card transactions by clicking an icon on your Web page. Fees range from \$395 to \$595 per month for up to 500 transactions, plus a \$500 setup charge. Of course, that doesn't include the cost of designing the site.

If your needs are more modest and you're looking for a faster, simpler solution, **ViaWeb** can have you selling your products online in minutes, literally. Its Web site has an online editor that lets you build a simple storefront on ViaWeb's server and stock it with your products. It doesn't get much easier. For \$100 a month for up to 50 items or \$300 for up to 1000 items, and no per-transaction fee, it's a good deal.

Another online solution worth watching closely is the alliance between American Express, Hewlett-Packard, and Mercantec, the maker of the popular Softcart commerce package. Still in trials with EarthLink and MindSpring at press time, the group's pilot program, ExpressVault, will cost \$120 per month, with no per-transaction fee, and will offer coordination with popular accounting packages like Intuit's QuickBooks, as well as secure payment backed by American Express. It should be available by the time you read this.

When all is said and done, if you're thinking of hooking up your business to the Internet, you've got two big decisions

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206 Power Desktops



216 Budget Desktops



226 Notebooks



230 Home PCs



235 Printers



239 Monitors



241 Graphics Boards



243 Modems



PENTIUM II-333s Raise the Bar

EDITED BY MICHAEL DESMOND
AND ANDREW BRANDT

NEC'S SPL 333: Slightly
faster, for a price.

HENRY FORD once said that
people can buy any color Model T
they want, as long as it's black. With Intel's
latest Pentium II-333 chip now on the streets,
and faster PII-350 and PII-400 versions coming soon,
you can almost hear Andy Grove muttering much ►

DELL'S M266XT: First
to the notebook finish line.



HARD WORKER: Dell's fast and loaded Dimension XPS D333 desktop.

the same thing: "They can have any CPU they want, as long as it's a Pentium II."

The latest is the PII-333, found in two machines we tested this month. The PII-333 is the first of the long-anticipated Deschutes-class chips, which use a new manufacturing process to break the 300-MHz barrier, and the first PCs based on it are amazingly inexpensive, selling for as little as \$2500. The low prices are in turn driving down the prices of 233-, 266-, and 300-MHz Pentium II systems, a phenomenon that is rewriting our power and budget charts.

Even as Deschutes debuts, however, the expected arrival of more-powerful systems gives buyers reason to pause. By the end of April, faster system RAM and motherboards, and ever faster Pentium II processors—running up to 400 MHz—promise to shake up the buying picture.

A LITTLE FASTER... AND MORE EXPENSIVE

WE REVIEWED two Pentium II-333 power desktop systems: the Dell Dimension XPS D333 and the NEC Direction SPL 333. Though powerful and relatively cheap, neither fared as well as we expected on our power chart. NEC's SPL 333 didn't make our Best Buy list, and Dell's XPS D333 failed to oust its 300-MHz sibling

from the number one spot. Why? They still cost more than 300-MHz machines but offer little performance improvement. The Direction SPL 333 is the third-fastest PC we've ever tested, with a PC World-Bench score of 276, but its \$2487 price is \$438 higher than the Direction SPL 300's. The SPL 333 is configured with 64MB of SDRAM, a 6.4GB hard disk, and a 17-inch monitor, just like the Direction SPL 300.

The Dell Dimension XPS D333 is nearly identical to the \$2999 XPS D300, our number one power machine for the second month in a row. Like the D300, the D333 comes with a second-generation DVD-ROM drive and an STB Velocity 128 3D video card. The D333 set a new PC World-Bench performance record with its 281 score—but it costs \$200 more than the D300.

This month we tested three notebooks based on the new Pentium MMX-266 CPU, but our tests showed that the 266-MHz chip has an overall performance gain of less than 3 percent over the fastest PMMX-233—hardly a significant increase. Leading the newcomers: Dell's \$3299 Inspiron 3000 M266XT,

which finished in third place on our power notebooks chart with a PC World-Bench score of 250.

DIMINISHING RETURNS

MOST USERS will be hard-pressed to notice the difference between a PII-300 and a PII-333 chip in their business applications. The Direction SPL 333 scored under 3 percent higher than the average for PII-300 systems tested to date, yet it costs 21 percent more than the budget-priced SPL 300. The Dimension XPS D333—the fastest PC we've ever tested—managed a 3.4 percent speed advantage, but it costs about 7 percent more than the D300.

Why the tepid performance improvement? One reason may be that the typical clock-speed boost you get in each incremental processor release is less significant as speeds increase. For instance, a 266-MHz chip has a clock that's 14 percent faster than that of a 233-MHz chip; a 333-MHz chip's clock is only 11 percent faster than that of a 300-MHz CPU.

But to lay the blame for lagging performance on the processor alone would be like blaming a canary for not being able to carry an anvil. A faster CPU can only improve performance as long as the power of subsystems (like the system bus) and components (like RAM) speed up; all play a role in overall PC performance.

We may be in for major changes soon, though. Next month Intel will release new chip sets that run the system bus at 100



SPEED FREAK:
The Millennia XKU 300 is
Micron's home-office powerhouse.

MHz—the first significant increase since 1993, when the industry standard was set at 66 MHz. This development is paired with the release of 350- and 400-MHz Pentium II chips designed for the new bus. Technical experts we interviewed all agree on one thing: The performance increase should be more substantial than in recent years—and some 350-MHz systems may cost as little as \$3000.

MAINSTREAMING

EVERYONE KNOWS the old magician's trick: Distract the audience with the right hand so nobody notices what the left is doing. When the Pentium II-300 processor debuted, the smart buyers held out for bargains based on Intel's existing stock. The same is true for the new Pentium II-333: You can get good deals as chip prices drop across the board, from the fading Pentium MMX to the now-mainstream Pentium II.

Vendors are currently shipping value-minded PII-300 desktops in droves. More than half of our power chart systems now use the PII-300. Not surprisingly, bargains also abound on PCs with Pentium MMX, AMD K6, and Cyrix 6x86MX CPUs. Kingdom's Pinnacle M200+ V, based on Cyrix's 6x86MX-PR200 processor, costs just \$1197 while offering competitive budget performance. The new Racer Daytona 233 GT—which we reviewed but which fell short of making the chart—delivers slightly better performance and costs \$1399.

Just make sure you don't sell yourself short. Most of these machines lack an Accelerated Graphics Port for adding AGP video processors—a consideration for upcoming AGP-enhanced 3D software. Also, our tests show that, when executing MMX operations, other CPUs lag behind the Pentium II; Windows NT runs more efficiently on Pentium II chips as well. So before you snatch up a bargain, think about what you want.

THE EYES HAVE IT

THIS MONTH, we review the latest 19- and 21-inch monitors. Not only do the new 19-inch displays offer 25 percent more viewable area than the 17-inch mod-

els, several of these new products use a short-neck tube, which reduces the amount of desktop space they need. Our top pick among the 19-inchers is the Iiyama VisionMaster 450. Our favorite 21-inch monitor is Cornerstone Imaging's \$1535 Color 50/101sf, which earned top marks for its flawless picture quality.

In this month's Top 10 Home PCs chart, Micron's new 300-MHz Millennia XKU 300 stands out as the Porsche of home computers. This fast multimedia Pentium II-300 system will turn the heads of game freaks everywhere.

The Millennia XKU 300's \$3498 price buys you a ton of power and a pile of game gadgets—a Microsoft SideWinder

joystick, a ThrustMaster game pad, a high-end Cambridge Soundworks PC speaker-subwoofer set, top-notch game titles, and a built-in DVD-ROM drive—that will make you the envy of every kid on the block.




GAMER'S DELIGHT: Micron's fun bundle.


Michael Desmond is a senior associate editor and Andrew Brandt is an associate editor for PC World. Assistant Editor Mick Lockey, Staff Editor Grace Aquino, Senior Associate Editor Bryan Hastings, and freelance writers Jon Jac-


obi and Nancy Canning contributed to the Top 100. Testing for the Top 100 performed by Ulrike Diehlmann, Robert James, Elliott Kirschling, Jeff Kuta, and Mike Salayko of the PC World Test Center. See page 14 for contact information.


YOUR GUIDE TO THE TOP 100

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, monitors, modems, printers, and graphics boards we've tested. System charts are divided by price. Power desktops cost \$2250 or more; power notebooks cost \$2750 or more. We compare new products to previously reviewed hardware, updating the charts to reflect price cuts and 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 is above average.

 **What does the PC WorldBench score mean?** It's a measure of how fast a PC is in relation to our baseline machine, a Dell P75t configured with 8MB of RAM, a 540MB hard drive, and no secondary cache. A PC






that scores 200, for instance, is twice as fast as the baseline unit.

 **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. So a budget PC that is rated "expensive" is high-priced only in relation to other budget PCs. Word scores for other categories are relative to all desktops or all notebooks.

 **Check out *PC World's* Top 400 reviews online.** Go to PC World Online (www.pcworld.com/hardware/t2010) to explore our Top 400, which provides comprehensive reviews and ratings for products in 16 categories. Search by vendor, peruse the latest Top 10 and Top 20 charts, or build custom charts from our product review database using your own criteria. You'll also find reviews not available in print.

PC WORLD TOP 20 POWER DESKTOPS

	SYSTEMS	Last month	Month tested	Street price (1/9/98)	CPU	Comments
1	 Dell Dimension XPS D300 800/388-8542 www.dell.com	1	Mar 98	\$2999	Pentium II-300	\$50 off fast, loaded PII-300, with 2X DVD-ROM drive, 9.1GB hard disk, Iomega Zip drive.
2	 Gateway 2000 G6-266 800/846-2000 www.gateway.com	2	Feb 98	\$2761	Pentium II-266	Quick, good-looking PC with 19-inch monitor and ethernet gets \$50 price cut.
3	 Micron Millennia XKU 300 888/634-8799 www.micronpc.com	6	Nov 97	\$3074	Pentium II-300	\$323 price cut for very fast PC with great 19-inch monitor, Iomega Zip drive.
4	 Dell OptiPlex GXa 266 800/388-8542 www.dell.com	4	Nov 97	\$2518	Pentium II-266	\$68 off ethernet-equipped PC with great design, fine reliability and support; no modem.
5	 Unicent Avanta L300 800/308-3614 www.unicent.com	7	Feb 98	\$2399	Pentium II-300	Steep \$250 price cut on very fast and loaded PII-300 midtower.
6	Gateway 2000 E-3110 300 800/779-2000 www.gateway.com	3	Feb 98	\$2989	Pentium II-300	Quick Pentium II-300 is loaded with features, including 19-inch monitor.
7	NEC Direction SPL 333 888/863-2669 www.necnow.com	n/a	NEW	\$2487	Pentium II-333	Intel's fastest CPU in a well-designed and affordable midtower.
8	DirectWave MVP VX2-300 800/882-8108 www.directwave.com	8	Jan 98	\$2499	Pentium II-300	Superfast, well-configured tower comes with generous support policies.
9	Quantex QP6/300 SM-4X 800/896-4898 www.quantex.com	9	Mar 98	\$2999	Pentium II-300	Fast, well-stocked PII-300 includes 19-inch monitor, large hard disk, good software.
10	Sys Technology Sys Performance 233M2 800/613-9963 www.systechology.com	13	Jan 98	\$2251	Cx6x86MX-PR233	Fast, Cyrix-powered corporate PC with good features gets \$293 price cut.
11	Sys Technology Sys Performance Pro 300LA 800/613-9963 www.systechology.com	11	Feb 98	\$3210	Pentium II-300	Fastest PII-300 boasts top-notch components.
12	AST Bravo MS 6300 800/876-4278 www.ast.com	12	Mar 98	\$2570	Pentium II-300	Corporate midtower includes ethernet card and network software.
13	Micron ClientPro 766Xi 888/634-8799 www.micronpc.com	16	Mar 98	\$2728	Pentium II-266	\$171 price cut for well-designed, networkable PII-266; hard disk is relatively small.
14	Royal Computer Synergy 2000 800/486-0008 www.goroyalpc.com	n/a	NEW	\$2298	Pentium II-266	PII-266 midtower comes with first-generation DVD-ROM drive.
15	Netis Starburst 300 800/577-7526 www.netlistech.com	17	Mar 98	\$2480	Pentium II-300	\$220 off generic, business-minded PII-300 with network utilities; lacks software.
16	Kingdom Pinnacle 266/S 800/385-3436 www.kingdomcomputers.com	18	Feb 98	\$2397	Pentium II-266	\$100 off affordable, small-office PC with generic components.
17	Vektron Super PowerStation PII-300 800/725-0026 www.vektron.com	19	Feb 98	\$2695	Pentium II-300	Very fast, loaded PII-300 with 19-inch monitor.
18	CLR Infinity PT2-DA300 800/611-1555 www.clrusa.com	n/a	NEW	\$2899	Pentium II-300	Loaded midtower is great for home or office; slower than average PII-300.
19	Acma EXP Pro 300L 800/786-6888 www.acma.com	n/a	NEW	\$2698	Pentium II-300	Fast midtower is ready for videoconferencing, has Iomega Zip drive; fair support.
20	Racer Talladega 300 RS 800/843-8458 www.racerpc.com	n/a	NEW	\$3049	Pentium II-300	Another loaded and somewhat pricey PII-300; poor documentation.



Best Buy

See features chart, page 208; test report, page 210.

n/a = not applicable

¹ For more information about all products in this table, circle reader service no. 904.

² Insufficient data to give a rating.



OUR POWER DESKTOPS CHART is fast becoming a list of the best 300-MHz PCs. Three fast PII-300s from CLR, Acma, and Racer enter the charts with high-end configurations geared toward the home or small office. Only one new system based on Intel's latest chip, the Pentium II-333, makes the chart: NEC's \$2487 Direction SPL 333. Dell's \$3199 Dimension XPS D333 impressed us with its loaded configuration and top-rated performance, but the minimal performance gain the D333 offers over the D300 failed to outweigh the steep price difference. The D300, reviewed last month, stays in the top spot mainly for this reason—it costs \$200 less than the nearly identical D333.

SCORECARD

★ Overall rating	PC WorldBench score/performance	Features and design	Vendor's system reliability	Price	Vendor's support quality/policies	Reader service number ¹
89	272/outstanding	very good	above average	average	above average/best	645
89	263/very good	outstanding	average	average	above average/best	646
87	270/outstanding	very good	above average	average	above average/best	647
86	259/very good	good	above average	inexpensive	above average/best	648
86	270/outstanding	very good	²	very inexpensive	² /best	649
86	268/outstanding	very good	average	average	above average/best	650
84	276/outstanding	very good	below average	inexpensive	below average/good	651
84	272/outstanding	good	²	inexpensive	² /best	652
83	268/outstanding	good	average	average	average/best	653
82	259/very good	very good	²	very inexpensive	² /good	654
81	277/outstanding	very good	²	expensive	² /good	655
81	265/outstanding	good	average	inexpensive	below average/best	656
81	259/very good	satisfactory	above average	average	above average/best	657
80	264/outstanding	very good	²	very inexpensive	² /worst	658
80	266/outstanding	good	²	inexpensive	² /fair	659
79	264/outstanding	good	²	very inexpensive	² /fair	660
79	268/outstanding	good	²	inexpensive	² /good	661
78	265/outstanding	good	²	average	² /good	662
78	268/outstanding	good	²	inexpensive	² /fair	663
78	267/outstanding	good	²	average	² /good	664
Scorecard weightings	Performance 25 percent	Features 25 percent	Reliability 15 percent	Price 15 percent	Quality/policies 10 percent each	

This Month's Best Buys

1 DELL DIMENSION XPS D300

PRO: Outstanding performance and value

CON: Limited expandability



The \$2999 Dell Dimension XPS D300 is our number one power machine for the second month in a row, despite a stiff challenge from its

near-twin, the \$3199 Dimension XPS D333, which we also looked at this month. The two systems feature almost identical configurations, including second-generation DVD-ROM drives for playing all those multimedia titles due to hit stores this summer. The main difference is price. Although the D333 achieved a record-setting PC WorldBench score of 281—9 points higher than the D300's

272—it's a mere 4 percent faster. Since that's hardly worth a \$200 premium, the D300 continues to enjoy center stage.



Dell Dimension XPS D300

Another reason for the D300's continuing reign is its built-in Iomega Zip drive—an amenity that its 333-MHz sibling lacks. The 9.1GB hard disk is also the largest we've seen. The sharp 17-inch monitor provides ample viewing area but lacks sophisticated controls. The system comes with two Microsoft applications: Office 97 Small Business Edition and the Streets Plus mapping package. The 4MB STB Velocity 128 3D graphics card performed well in our 2D and 3D tests, and it supports Accelerated Graphics Port texturing features that some AGP cards don't. Creative Labs' Sound Blaster AWE64 board provides top-notch wavetable audio and MIDI playback, and gets a boost from the nifty Altec Lansing speaker-subwoofer set.

Upgrading the D300 takes some planning and isn't always as easy as we'd like. The case is hard to open, due to some difficult-to-grip tabs on its side-opening panel. A modem and sound card take up both ISA slots, leaving just two PCI slots free. And there's only one available memory socket, though it takes DIMMs, which you can add singly (unlike SIMMs, which have to be installed in pairs).

The company's support policies are strong: Parts are covered for three years and labor for one, and toll-free phone support is available around the clock.

2 GATEWAY 2000 G6-266

PRO: Very good performance, high-quality components, large monitor, network adapter

CON: Curved top of midtower case makes it hard to stack peripherals.



The \$2761 Gateway 2000 G6-266 holds steady at number two for the second straight month, following a \$50 price cut. This fast Pentium II-266 midtower is one of two Best Buy systems (the other is Micron's Millennia XKU 300) outfitted with a jumbo 19-inch monitor, allowing comfortable viewing at resolutions as high as 1280 by 1024 pixels. ►

	SYSTEM	CPU	RAM (MB)	Secondary cache (KB)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/viewable diagonal (inches)	Screen pitch (mm)	CD/DVD-ROM drive speed
1	Dell Dimension XPS D300*	Pentium II-300	64	512	9.1	STB Velocity 128 3D	4/SGRAM	17/15.8	.26	DVD-2X
2	Gateway 2000 G6-266*	Pentium II-266	64	512	6.4	STB Velocity 128 3D	4/SGRAM	19/18	.26	12X-24X
3	Micron Millennia XKU 300*	Pentium II-300	64	512	6.4	Diamond Viper V330	4/SGRAM	19/18	.22	14X-32X
4	Dell OptiPlex GXa 266*	Pentium II-266	32	512	3.2	ATI 3D Rage Pro	4/SGRAM	17/15.8	.26	12X-24X
5	Unicent Avanta L300*	Pentium II-300	64	512	6.4	Matrox Millennium II	4/WRAM	17/15.7	.26	14X-32X
6	Gateway 2000 E-3110 300	Pentium II-300	64	512	8.4	Permedia II AGP	8/SGRAM	19/17.9	.26	12X-24X
7	NEC Direction SPL 333	Pentium II-333	64	512	6.4	Diamond Viper V330	4/SGRAM	17/16	.27	12X-24X
8	DirectWave MVP VX2-300	Pentium II-300	64	512	7	Matrox Millennium II	4/WRAM	17/16.1	.26	12X-24X
9	Quantex QP6/300 SM-4X	Pentium II-300	64	512	8	Diamond Viper V330	4/SGRAM	19/17.9	.26	12X-24X
10	Sys Technology Sys Performance 233M2	Cx6x86MX-PR233	32	512	6.4	Number Nine Revolution 3D	8/WRAM	17/15.9	.26	12X-24X
11	Sys Technology Sys Performance Pro 300LA	Pentium II-300	64	512	6.4	Number Nine Revolution 3D	8/WRAM	17/15.9	.26	12X-24X
12	AST Bravo MS 6300	Pentium II-300	32	512	4.3	ATI 3D Rage II+	2/SGRAM	17/15.7	.28	12X-24X
13	Micron ClientPro 766Xi	Pentium II-266	64	512	3.2	Diamond Viper V330	4/SGRAM	17/16	.26	12X-24X
14	Royal Computer Synergy 2000	Pentium II-266	64	512	4.3	ATI Xpert@Play	4/SGRAM	17/16	.25	DVD-1X
15	Netis Starburst 300	Pentium II-300	64	512	6.1	Matrox Millennium II	4/WRAM	17/15.9	.26	12X-24X
16	Kingdom Pinnacle 266/S	Pentium II-266	64	512	4.3	Hercules Terminator 3D	4/EDO DRAM	17/15.8	.26	12X-24X
17	Vektron Super PowerStation PII-300	Pentium II-300	64	512	7	Matrox Millennium II	8/WRAM	19/17.9	.26	14X-32X
18	CLR Infinity PT2-DA300	Pentium II-300	64	512	8.1	ATI Xpert@Play	8/SGRAM	17/15.6	.28	12X-24X
19	Acma EXP Pro 300L	Pentium II-300	32	512	4.1	Diamond Viper V330	4/SGRAM	17/16	.25	12X-24X
20	Racer Talladega 300 RS	Pentium II-300	64	512	8.4	Matrox Millennium II	4/WRAM	17/16	.28	12X-24X

* Best Buy ¹ PC World defines towers as taller than 20 inches, midtowers as 15.5 inches to 20 inches, and minitowers as less than 15.5 inches.

² Downloads only, uploads at 33.6 kbps; uses 3Com/U.S. Robotics' x2 technology.

The G6-266 comes ready for office duty, thanks to a 3Com PCI 10/100 ethernet adapter that supports fast 100-megabits-per-second networks. And unlike many network-ready systems, the G6-266 also includes a 56-kilobits-per-second x2-compatible modem, though the speakerphone-capable unit doesn't function with DOS-only programs. The STB Velocity 128 3D video card is one of the better AGP boards on the market, and the Ensoniq Audio PCI wavetable card and Boston Acoustic satellite speakers with subwoofer provide terrific sound.

Nifty design touches enhance this corporate-minded PC. The sides and top of the light-gray case curve outward; it's a



Gateway 2000 G6-266

nice contrast to square, putty-colored boxes, but the arched top means you can't place external peripherals or disks there. We found the case simple to remove: A side-panel grip at the back makes the case easy to pop off. Inside, there's lots of expansion room, with a neat interior and plenty of available slots, memory sockets, and drive bays.

The G6-266's keyboard is also distinctive, with large keys and a row of special buttons at the top that let you adjust the sound level, and control audio CDs and even a TV or radio if you hook up the system to a home entertainment center.

Gateway's glossy, well-organized manual offers informative help. The company

also has excellent support policies, including a three-year warranty on parts and labor and 24-hour toll-free tech support.

3 MICRON MILLENNIA XKU 300

PRO: Faster than the average PII-300, great 19-inch monitor, Iomega Zip drive, great speakers

CON: Still pricey



Micron's Millennia XKU 300 has been in and out of Best Buy territory since we reviewed it last November. This month, a big price cut to \$3074 boosts it firmly back up the chart.

A no-holds-barred dream box for the small or home office, the XKU 300's luxurious components include a beautiful Hitachi 19-inch monitor that displays crisp, evenly focused text and good-looking graphics from corner to corner. Now

EXPANDABILITY

CUSTOMER SUPPORT

Modem speed (kbps)	Sound board	Case style ¹	Max. RAM (MB)	Maximum secondary cache (KB)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
56 ²	Sound Blaster AWE64	midtower	384	512	1	2/1	2	3/1	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ²	Ensoniq Audio PCI	midtower	384	512	2	3/2	2	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ²	Sound Blaster AWE64	midtower	384	512	1	2/0	3	3/1	24	Sat., Sun.	BBS, CIS, WWW
not included	Crystal 4326B	midtower	384	512	2	2/1	7	3/1	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ²	Ensoniq Audio PCI	midtower	384	512	2	3/1	3	varies ⁴ /3	24	Sat., Sun.	BBS, WWW
not included	Sound Blaster 16	midtower	384	512	2	3/2	3	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ²	Yamaha YMF715	midtower	384	512	1	3/1	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ³	Sound Blaster AWE64	tower	384	512	1	4/1	4	3/3	24	Sat., Sun.	BBS, WWW
56 ³	Ensoniq Audio PCI	midtower	384	512	2	3/3	3	3/1	24	Sat., Sun.	BBS, WWW
56 ²	Sound Blaster AWE64	midtower	256	512	5	3/2	3	varies ⁵ /5	24 ⁶	Sat., Sun. ⁶	WWW
56 ²	Sound Blaster AWE64	midtower	512	512	2	3/2	4	varies ⁵ /5	24 ⁶	Sat., Sun. ⁶	WWW
not included	ESS AudioDrive 1869	midtower	384	512	2	2/1	6	3/3	24	Sat., Sun.	AOL, BBS, CIS, WWW
not included	Sound Blaster AWE64	midtower	384	512	2	3/1	3	3/1	24	Sat., Sun.	BBS, CIS, WWW
56 ²	Sound Blaster AWE64 Gold	midtower	256	512	3	2/0	2	1/1	11	Sat.	BBS, WWW
56 ²	Sound Blaster CT4170	midtower	384	512	1	3/1	3	1/3	10	Sat.	BBS, WWW
56 ³	Creative Labs Vibra 16	midtower	512	512	2	2/3	2	varies ⁴ /1	15.5	Sat.	WWW
56 ²	Yamaha OPL3	midtower	384	512	2	3/0	4	3/1	24	Sat., Sun.	WWW
56 ²	Yamaha OPL3-Sax	midtower	384	512	1	2/0	4	3/3	12	none	WWW
56 ²	Sound Blaster AWE64	midtower	384	512	2	1/0	3	3/1	9.5	none	BBS, WWW
56 ²	Ensoniq Audio PCI	midtower	384	512	1	3/1	3	3/3	12	Sat.	none

² Downloads only, uploads at 33.6 kbps; uses Rockwell-Lucent's K56flex technology.

³ Five years on CPU and main RAM, three years on other parts.

⁵ Six years on CPU and main RAM, one to five years on other parts.

⁶ After one year, support drops to 9 hours on weekdays only, not toll-free.

you'll be able to step up to 1280 by 1024 resolution with less risk of eyestrain. Set up to entertain as well, the XKU 300 also comes with a Sound Blaster AWE64 card plus Cambridge Soundworks speakers with subwoofer for excellent audio output. People who use their PCs for digital recording will appreciate the sound card's full-duplex capabilities, which let you record and play simultaneously.

Like an increasing number of high-end PCs, the XKU includes a built-in Iomega Zip drive, which is convenient for backing up files and folders and transporting amounts of data too large to fit on a floppy disk. You also get a good-size 6.4GB Ultra-DMA hard drive with a bus-

master controller, a 14X-32X CD-ROM drive, and a fast 56-kbps x2 Sportster modem from 3Com/U.S. Robotics.

The XKU 300—like the rest of the current PII-300 crop—also includes AGP graphics. There aren't many AGP-compatible applications available yet (you won't see an improvement with the current versions of business software), but at least the AGP bus with its dedicated slot frees up a PCI slot that would otherwise be used for a graphics card.



Micron Millennia XKU 300

Micron's warranty is only average—parts are covered for three years and labor for one year—but the company's free round-the-clock technical support is as good as it gets.

4 DELL OPTIPLEX GXA 266

PRO: Great design, Trinitron monitor, highly expandable, built-in ethernet

CON: No modem, skimpy software bundle



The Dell OptiPlex GXA 266 hangs on in fourth place, in part because of a modest \$68 price cut that helped it stave off the also-discounted Unident Avanta L300, now at number five. This \$2518 midtower may no longer be the least expensive Best Buy system, but its attractive networking and upgrade features make it well suited for any office.

Geared toward networked corporate environments, the GXA 266 relies more on sensible design than on the very latest technology. The PII-266 system has no business applications or modem, but it's easy to upgrade and comes with perks ►

for network managers. The GXa 266 is based on Intel's new NLX motherboard design, which lets users access the seven free slots by simply removing the case and lifting a lever—the entire circuit board on which the slots are mounted slides out. Like other Dell OptiPlexes, the GXa 266 has an integrated ethernet card and DMI 2.0 client management software, which permits remote management from a central office. The GXa 266's PC World-

Bench score of 259—average for a Pentium II-266—shows that you don't have to sacrifice performance to enjoy system stability.

The GXa 266 we tested came with a good-looking 17-inch Dell Trinitron monitor and a very comfortable keyboard. A pair of Altec Lansing ACS 290 speakers delivered strong (if somewhat muddy) bass.



Dell OptiPlex GXa 266

The system is backed by good support policies, including a three-year warranty on parts and one-year coverage on labor, around-the-clock technical support, and free on-site service for the first year.

According to our readers, the quality of Dell's support and the reliability of its desktop PCs are both above average. ►

TOP 20 POWER DESKTOPS

TEST REPORT

SYSTEMS	CPU	RAM (MB)	Secondary cache (KB)	PC WorldBench score	◀ Faster	Slower ▶	Average of tested Pentium II-300s
1 Dell Dimension XPS D300*	Pentium II-300	64	512	272			
2 Gateway 2000 G6-266*	Pentium II-266	64	512	263			
3 Micron Millennia XKU 300*	Pentium II-300	64	512	270			
4 Dell OptiPlex GXa 266*	Pentium II-266	32	512	259			
5 Unicent Avanta L300*	Pentium II-300	64	512	270			
6 Gateway 2000 E-3110 300	Pentium II-300	64	512	268			
7 NEC Direction SPL 333	Pentium II-333	64	512	276			
8 DirectWave MVP VX2-300	Pentium II-300	64	512	272			
9 Quantex QP6/300 SM-4X	Pentium II-300	64	512	268			
10 Sys Technology Sys Performance 233M2	Cx6x86MX-PR233	32	512	259			
11 Sys Technology Sys Performance Pro 300LA	Pentium II-300	64	512	277			
12 AST Bravo MS 6300	Pentium II-300	32	512	265			
13 Micron ClientPro 766Xi	Pentium II-266	64	512	259			
14 Royal Computer Synergy 2000	Pentium II-266	64	512	264			
15 Netis Starburst 300	Pentium II-300	64	512	266			
16 Kingdom Pinnacle 266/S	Pentium II-266	64	512	264			
17 Vektron Super PowerStation PII-300	Pentium II-300	64	512	268			
18 CLR Infinity PT2-DA300	Pentium II-300	64	512	265			
19 Acma EXP Pro 300L	Pentium II-300	32	512	268			
20 Racer Talladega 300 RS	Pentium II-300	64	512	267			

*Best Buy

Application test times in minutes

0 10 20



Word 7.0 for Windows 95



Picture Publisher 6.0 for Windows 95



WordPerfect 6.1 for Windows



Excel 7.0 for Windows 95



Paradox 5.0 for Windows



1-2-3 release 5 for Windows

HOW WE TEST All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 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 score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (www.pcworld.com/testing).

What drives John.



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*Menu of
freeze-dried entrees*

Spacecraft blueprints

*The Unabridged
History of Flight*

*9,000 documented
simulator hours*

*Signed photo of
first moon walk*

*Mission Control
Manual*

*Collected
squadron patches*

Moon rocks

*Crayon drawings
from the Laguna
4th graders*

*Vintage vinyl
collection*

*Fitness and
medical reports*

John's drive.



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Circle 251 on reader service card

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Digital**

5 UNICENT AVANTA L300

PRO: Extremely fast, affordable for a PII-300 system, generous warranty

CON: Skimpy documentation, troubling support calls, AGP video card lacks advanced features



Solidly built and loaded with powerful components, the Unicent Avanta L300 emerges as a Best Buy this month; a \$250 price cut helped push this midtower system from seventh place last month to fifth. At \$2399, the Avanta L300 is the least expensive Best Buy system on the power chart, but novice users should beware the L300's slim documentation. If you don't know your way around a desktop computer, the going could get a little rough.

With a PC WorldBench score of 270, the Avanta L300 runs slightly ahead of the average for PII-300 systems. The midtower includes a 6.4GB hard disk, a size that's typical for systems on our power chart, while the CD-ROM drive spins at a fast 14X-32X rate. Multimedia fans will probably want a more sophisticated graphics card than the included Matrox Millennium II, which lacks key 3D features such as alpha blending and AGP

texturing. The Ensoniq Audio PCI sound card provides audio for business use, but it lacks the

positional 3D audio features found in new PCI-based sound boards. Despite the lack of 3D audio, the Premier SW 32 speakers with subwoofer produce good-quality sound.

If you want to upgrade the system, you'll find plenty of free PCI slots and open drive bays. However, ISA slots are in short supply—a common problem with Pentium II motherboards. What's more, Unicent's system documentation is too sparse, posing a challenge for novices who want to upgrade their PC or diagnose problems. That said, the Avanta does benefit from Unicent's admirable support policies, which include a lengthy warranty on parts. Labor is covered for three years, and technical support is available 24 hours a day, seven days a week. However, our calls to Unicent's support lines

led to hold times of 10 to 15 minutes, and we sometimes received less-than-accurate responses to our questions.

New This Month

The following PCs made our power desktops chart for the first time this month. For original reviews of previously tested PCs on the chart, visit our Web page (www.pcworld.com/t20pcs).

7 NEC DIRECTION SPL 333

PRO: Extremely fast; low price for a PII-333

CON: Not much faster than the SPL 300

NEC's Direction line has impressed us since its launch last year, delivering strong performance, user-friendly designs, and low prices to home and corporate buyers alike. Now the Direction SPL 333 makes Intel's fastest CPU available for \$2487. While this rugged midtower includes a slew of high-quality multimedia components, its PC WorldBench score of 276 is a slim 2.6 percent higher than that of its PII-300 sibling, the Direction SPL 300.

With 64MB of SDRAM and a 6.4GB hard disk, the SPL 333's configuration compares favorably with those of top-ranked power desktops. The Diamond Viper V330 AGP graphics card is an admirable performer and a good match with NEC's 17-inch C700 monitor, which produces crisp images and has intuitive front-panel controls. The company also bundles Microsoft Office 97 Small Business Edition software with the system.

The inexpensive 12X-24X CD-ROM drive helps the NEC achieve its low price, though multimedia enthusiasts may face a DVD upgrade down the road. The integrated Yamaha audio chip lacks the full features of the best sound boards.

The SPL 333 boasts the same careful attention to detail found in other Direction PCs, including color-coded rear ports and an easy-open case. NEC backs its Direction line with a three-year warranty on parts and labor, but the company has a history of below-average reliability and service. We had no trouble getting through to tech support, but we received minimal advice.



NEC Direction SPL 333

14 ROYAL COMPUTER SYNERGY 2000

PRO: Terrific performance, DVD-ROM and Iomega Zip drives

CON: Limited support policies, no system-specific documentation

If you have a long wish list and a short budget, you might consider the Synergy 2000 from Royal Computer. It's fast, comes with both a DVD-ROM drive and an Iomega Zip drive, and costs only \$2298—that's \$500 to \$700 less than similarly configured systems, such as Dell's Dimension XPS D300. Just be careful: Royal's sparse documentation and limited support make the Synergy a system best suited

for veteran users. Also, the included DVD drive is a first-generation Pioneer model, so it cannot read re-



Royal Synergy 2000

cordable or rewritable CD media. This fast PII-266 midtower earned a PC WorldBench score of 264, slightly ahead of the curve for systems in the same processor class. Aside from the DVD-ROM drive, it features top-notch components like a 3Com/U.S. Robotics 56-kbps x2 modem and ATI's impressive Xpert@Play graphics board—a superior AGP card that comes with a video capture port. The 17-inch monitor produced bright, colorful images, though the front panel controls are confusing. And the Creative Labs Sound Blaster AWE64 Gold audio card is among the best.

So how does a loaded, affordable PC like the Synergy stall in the bottom half of our chart? For one thing, Royal's one-year warranty on parts and labor is comparatively

brief, and we had a hard time getting through to the company's unresponsive technical support staff. Documentation falls short, too: Royal provides only the various component manuals—

there is no user guide for the system itself. Opening the case requires a screwdriver; once inside, you'll find just two free drive bays plus a pair of open PCI slots for add-in card upgrades. ►

THE NEW 19" MONITORS ALL LOOK ALIKE.



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Cadallyst Magazine explains it like this: "Hitachi's best move was to avoid compromises after deciding on the smaller tube size." Instead of beefing up 17" video

electronics to handle a 19" tube, Hitachi took a 21" chassis with its best 21" digital control electronics and put a 19" tube in it. The result is performance every bit as good as the best 21 – far better than the performance of a souped up 17.

Other critics agree. Imaging Magazine judged the new Hitachi "BEST" of the recent AIIIM show – over other 19" monitors at the show. And CRN's Test Center recommends the Hitachi.

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HITACHI

18 CLR INFINITY PT2-DA300

PRO: Good documentation, strong support policies

CON: A bit slow for a PII-300, flimsy keyboard

The CLR Infinity PT2-DA300 is a well-equipped PC that comes bundled with Microsoft Office 97 Small Business Edition. Armed with a Pentium II-300 processor, the \$2899 Infinity turned in a score of 265 in our PC WorldBench tests—just below average for PII-300 systems—but this machine's rough design held it down near the bottom of the chart.

If you base your buying decisions on spec sheets, you'll like the Infinity. The system includes an ATI Xpert@Play AGP video card, and a 3Com/U.S. Robotics x2 56-kbps modem. The Labtec LCS-800 speakers were adequate, but we were disappointed by the simple buttons used to toggle bass and treble boosting. The system's keyboard looks and feels cheap, but we liked the Microsoft IntelliMouse and the sharp 17-inch VisionPro17 monitor.

The Infinity's small- and home-office system design is not impressive. We had a hard time removing the case, which is attached with a thumbscrew and two stubborn spring locks. Once inside, we had good access to the upgrade card slots, though like many PII desktops, the Infinity has just one free ISA slot. DIMM sockets are easy to access, but to add an internal drive you must remove the DIMMs, which block the drive bays.

CLR support is strong, with a three-year warranty on parts and labor, as well as free on-site service for the first year. The toll-free telephone support is limited to

12 hours on weekdays, though our calls to CLR's tech support revealed responsive and knowledgeable technicians.

19 ACMA EXP PRO 300L

PRO: Good performance, nice monitor, built-in Iomega Zip drive

CON: Small hard disk, minimal RAM, short support hours

The Acma EXP Pro 300L is a well-built midtower PC that's ready for office work, complete with Microsoft Office 97 Small

Business Edition and Spectrum Vision-Time's IVP videoconferencing software. The \$2698 price is attractive enough to push the Pro 300L onto our chart, but some buyers may want a beefier configuration—particularly if they choose to add a monitor-top digital video camera for conferencing.

The Pro 300L is something of a graphics specialist, with an excellent 17-inch Diamondtron monitor that has extensive on-screen controls and displays crisp images. The Diamond Viper V330 AGP graphics card with 4MB of SGRAM allows true-color display at 1024-by-768-pixel resolution. Creative Labs' Sound Blaster AWE64 card provides superior sound, but the bundled speakers and subwoofer lack bass response, making them best suited for general-purpose business audio. One concern we had is that the Pro 300L's 32MB of SDRAM is the bare minimum for a PC intended for videoconferencing; also, the 4.1GB hard disk is on the small side for a power desktop.

The gray midtower case features a sleek airflow grille and a hinged dustcover door to protect the three removable-media drives (floppy, CD-ROM, and Iomega Zip). The interior is easily accessible, by means of large thumbscrews. A power cutoff switch on the rear of the system's case overrides the power button on the system's front bezel. We thought the interior was poorly organized: Cables blocked easy access to the

RAM, which could make system upgrading needlessly difficult. But connections for the rugged Keytronic keyboard and Microsoft mouse are clearly labeled, and system documentation is complete and neatly packaged in a rigid storage box, with tabs for each component's manual.

The Acma warranty for EXP systems—three years for parts, one year for labor—is competitive with the policies of other major PC vendors, but phone technical support is limited to just 9.5 hours on

weekdays only. When we made calls to Acma's tech support, we received accurate answers to our questions but often faced 10-minute hold times.

20 RACER TALLADEGA 300 RS

PRO: Rugged wide-body case

CON: Limited ISA slots

The marketing folks at Racer Computer want to make one thing clear: Their machines go fast. But when we tested the Talladega 300 RS—named, by the way, after a NASCAR auto-racing course—we were a bit disappointed to see that its PC WorldBench score of 267 fell a couple of points short of the average for Pentium II-300 systems. Still, the Talladega is an extremely capable machine, outfitted with components like an 8.4GB Ultra-DMA hard drive and a subwoofer-equipped sound system. There's just one problem: At \$3049, Racer nearly prices its system out of the winner's circle.

The midtower case is among the sturdiest we've seen. Inside are plenty of drive bays and expansion slots, though they can be tough to reach. Like many PII desktops, however, the Talladega has just one free ISA slot, which is a problem if you want to add an ISA sound card as well as a scanner card. The CTX 17-inch monitor offers a crisp, steady picture and can muster 1024 by 768 pixels at a rock-solid 87-Hz refresh—a rate easily supported by the powerful Matrox Millennium II AGP graphics card. We got top-notch sound out of the Ensoniq Audio PCI sound card and the included Altec Lansing Powercube speaker set.

Racer's support policies are good. Customers get 12 hours of daily telephone support on weekdays, and there are Saturday hours as well. Unlike some other small vendors, Racer provides a three-year parts and labor warranty. ►

Beyond the Top 20: Online



We evaluated this system along with the others, but it didn't score high enough to reach the Top 20 Power Desktops chart. For a write-up, see PC World Online (www.pcworld.com/t20pcs).

◆ DTK APRI-76M/P266



CLR Infinity PT2-DA300



Racer Talladega 300 RS



Acma EXP Pro 300L

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Rock-bottom prices.

SMC Ethernet and Fast Ethernet LAN Solutions.

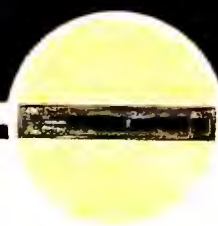


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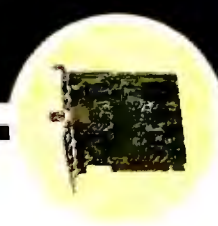


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Allied Telesyn	✓	—	—	✓
CNET	✓	—	—	—
D-Link	—	—	✓	✓
Kingston	✓	—	✓	✓
Intel	—	✓	—	✓

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PC WORLD TOP 20 BUDGET DESKTOPS

	SYSTEMS	Last month	Month tested	Street price (1/9/98)	CPU	Comments
1	 Dell Dimension XPS D266 800/388-8542 www.dell.com	1	Mar 98	\$2229	Pentium II-266	Midtower system includes fast 14X-32X CD-ROM drive, AGP graphics, Microsoft Office 97.
2	 Quantex QP6/300 SM-3x 800/896-4898 www.quantex.com	n/a	Dec 97	\$2199	Pentium II-300	\$400 price cut moves affordable PII-300 from power chart, great support policies.
3	 Gateway 2000 GP5-233 800/846-2000 www.gateway.com	3	Sept 97	\$1874	Pentium MMX-233	\$99 off fast, loaded multimedia system with 56-kbps modem.
4	 Unicent Avanta T233 800/308-3614 www.unicent.com	6	Jan 98	\$1849	Pentium MMX-233	\$250 price drop on well-stocked home and small-office PC.
5	 Gateway 2000 G6-233 800/846-2000 www.gateway.com	2	Feb 98	\$1999	Pentium II-233	Least expensive PII Best Buy has fast modem; small hard drive, slim software bundle.
6	Gateway 2000 E-3110 233 800/779-2000 www.gateway.com	4	Feb 98	\$2168	Pentium II-233	Beefed-up 4GB hard disk, improved monitor yield \$119 price boost on fast corporate PII.
7	Micro Express MicroFlex-P225JE 800/989-9900 www.microexpress.net	5	Jan 98	\$1349	AMD K6-233	\$50 trimmed from bargain speedster with PC-to-TV graphics card, great warranty.
8	Unicent Avanta L233 800/308-3614 www.unicent.com	n/a	NEW	\$1899	Pentium II-233	Refreshed PII-233 offers more value with better configuration.
9	Quantex QP5/200 SM-1 800/896-4898 www.quantex.com	8	Oct 97	\$1349	Pentium MMX-200	Affordable multimedia PC now \$150 cheaper, great support policies.
10	CyberMax PowerMax 800/437-4596 www.cybmax.com	7	Sept 97	\$1249	AMD K6-166	Fast, low-cost AMD K6 tower now comes with 56-kbps modem.
11	Dell OptiPlex Gn+233 800/388-8542 www.dell.com	11	Nov 97	\$1769	Pentium MMX-233	Well-designed corporate PC gets \$98 price cut; no free drive bays.
12	Midwest Micro Pro 300 800/728-8582 www.mwmicro.com	n/a	NEW	\$2169	Pentium II-300	Fast and affordable SOHO PII-300 comes with good support; no modem.
13	CyberMax SuperMax PII 300 800/437-4596 www.cybmax.com	n/a	Mar 98	\$2154	Pentium II-300	Big \$445 price cut moves fast PII-300 from power chart; no sound or modem.
14	Sys Technology Sys Performance 233K6 800/613-9963 www.systechology.com	n/a	Nov 97	\$2198	AMD K6-233	\$321 price cut shifts well-designed PC to budget chart; good support policies.
15	DirectWave MVP VK6-233 800/882-8108 www.directwave.com	9	Mar 98	\$1899	AMD K6-233	Affordable PC with great configuration and strong support policies; poor manuals.
16	Kingdom Pinnacle M200+ V 800/385-3436 www.kingdomcomputers.com	n/a	NEW	\$1197	Cx6x86MX-PR200	Very inexpensive system; weak support policies.
17	Micro Express MicroFlex P900E 800/989-9900 www.microexpress.net	13	Mar 98	\$1849	Pentium II-233	Least expensive PII system on chart, 64MB of RAM, excellent AGP graphics.
18	Polywell Poly K6233Mx 800/999-1278 www.polywell.com	15	Jan 98	\$1575	AMD K6-233	Well-configured, quick system is now \$275 less, has large hard drive.
19	NEC Direction SPL 300 888/863-2669 www.necnow.com	14	Mar 98	\$2049	Pentium II-300	Superfast PII-300 midtower gets faster CD-ROM drive; SPL 266L is also a good value.
20	Micron ClientPro Mre 233 888/634-8799 www.micronpc.com	n/a	NEW	\$1849	Pentium MMX-233	Price nudges up \$150 on network-ready midtower with 64MB of RAM, good support.



Best Buy

See features chart, page 218; test report, page 220.

¹ For more information about all products in this chart, circle reader service no. 903.

² Insufficient data to give a rating.



MORE PENTIUM II SYSTEMS than ever sit on the budget chart, including two new entries from Unicent and Midwest Micro that made the grade this month. A PII-300 powerhouse, in the form of the Quantex QP6/300 SM-3x, flew from last month's power chart to land in second place on this month's budget list, thanks to a huge \$400 price drop. But PCs with new Pentium MMX and alternative chips continue to emerge, including the \$1197 Kingdom Pinnacle M200+ V based on the Cyrix 6x86MX-PR200 processor. One new PII-266 desktop fell just shy of recognition: the \$2098 Acma EXP Pro 266L, a small- and home-office midtower that suffered from a below-average PC WorldBench score and short support hours.

SCORECARD

★ Overall rating	PC WorldBench score/ performance	Features and design	Vendor's system reliability	Price	Vendor's support quality/policies	Reader service number ¹
85	261/outstanding	very good	above average	expensive	above average/best	620
83	269/outstanding	very good	average	expensive	average/best	621
82	240/very good	good	average	average	above average/best	622
82	239/very good	very good	2	average	2/best	623
81	247/very good	good	average	average	above average/best	624
81	250/very good	good	average	expensive	above average/best	625
81	249/very good	good	2	inexpensive	2/best	626
80	253/outstanding	good	2	average	2/best	627
80	230/good	good	average	inexpensive	average/best	628
80	223/good	good	2	inexpensive	2/best	629
79	233/good	satisfactory	above average	average	above average/best	630
79	269/outstanding	good	2	expensive	2/good	631
78	270/outstanding	good	2	expensive	2/best	632
78	251/outstanding	very good	2	expensive	2/good	633
78	249/very good	good	2	average	2/best	634
78	236/very good	good	2	very inexpensive	2/fair	635
78	252/outstanding	good	2	average	2/best	636
78	240/very good	good	2	inexpensive	2/good	637
78	269/outstanding	good	below average	average	below average/good	638
77	237/very good	satisfactory	above average	average	above average/best	639
Scorecard weightings	Price 22 percent	Features 25 percent	Reliability 15 percent	Performance 18 percent	Quality/policies 10 percent each	

This Month's Best Buys

1 DELL DIMENSION XPS D266

PRO: Outstanding budget performance, multimedia features, top-rated support and reliability

CON: Limited ISA expansion

Thanks to a combination of strong performance, a reasonable \$2229 price, and Dell's record of great

service and reliability, the Dell Dimension XPS D266 enjoys a second consecutive month atop the budget list. The SOHO-oriented D266 uses a Pentium II-266 processor to deliver a terrific PC WorldBench score of 261.

The impressive list of features includes STB's Velocity 128 3D AGP graphics card. It's nicely matched with the 17-inch Dell 1000HS monitor, which provides a fine

.26mm dot pitch display suitable for either business or graphics applications. The included



Altec Lansing ACS- Dell Dimension XPS D266 290 speakers produce good sound, but hard-core gamers may want to spend another \$50 for a Creative Labs Sound Blaster AWE64 board to replace the integrated Yamaha chip this PC comes with.

The XPS D266's 14X-32X NEC CD-ROM drive boasts the fastest spin rate on the charts, but our experience suggests that only file transfers and software installations benefit from the faster data-transfer speed. Two DIMM sockets permit upgrades beyond the included 32MB of SDRAM. The familiar home-business software bundle of Microsoft's Office 97 Small Business Edition, Bookshelf, and Streets Plus (a mapping package) rounds out the package.

We must complain about the insufficient finger grips along the XPS D266's case edge. Also, there is only one free 16-bit ISA slot inside—none if you go with the AWE64 sound card—and three open PCI slots. Marked back ports and color-coded audio ports with matching speaker plugs ease setup.

A three-year parts and one-year labor warranty, along with 24-hour toll-free tech support, protect your purchase.

2 QUANTEX QP6/300 SM-3X

PRO: Very fast, great features and support policies

CON: Generic documentation, cluttered interior

If the Quantex QP6/300 SM-3x looks familiar, you probably recognize it from its tenure on our power desktops chart. A steep \$400 price cut—to \$2199—may have pushed this fast midtower into the budget ranks, but it still looks like a typical power system.

You get 64MB of SDRAM, a generous 6.4GB hard drive, and a 56-kbps K56flex-based modem. The generous Quantex QP6-300 SM-3x software bundle includes Microsoft Office 97 Small Business Edition, which will appeal to SOHO buyers. With a PC



	SYSTEMS	CPU	RAM (MB)	Secondary cache (KB)	Hard drive (GB)	Graphics adapter	Video RAM (MB/type)	Monitor tube/viewable diagonal (inches)	Screen pitch (mm)	CD-ROM drive speed
1	Dell Dimension XPS D266*	Pentium II-266	32	512	4.3	STB Velocity 128 3D AGP	4/SGRAM	17/15.8	.26	14X-32X
2	Quantex QP6/300 SM-3x*	Pentium II-300	64	512	6.4	Diamond Viper V330	4/EDO DRAM	17/16	.28	12X-24X
3	Gateway 2000 GP5-233*	Pentium MMX-233	32	512	2	STB Virge 3D PCI	4/VRAM	17/15.9	.28	12X-24X
4	Unicent Avanta T233*	Pentium MMX-233	64	512	6.4	Matrox Millennium II	4/WRAM	17/15.8	.26	14X-32X
5	Gateway 2000 G6-233*	Pentium II-233	32	512	2.1	STB Velocity 128	4/SGRAM	17/15.9	.28	12X-24X
6	Gateway 2000 E-3110 233	Pentium II-233	32	512	4	Permedia II AGP	8/SGRAM	17/15.9	.26	12X-24X
7	Micro Express MicroFlex-P225JE	AMD K6-233	32	512	3.1	ATI 3D Pro Turbo PC2TV	4/SGRAM	15/13.7	.28	12X-24X
8	Unicent Avanta L233	Pentium II-233	32	512	4.1	Matrox Mystique 22D	4/SGRAM	15/13.7	.28	14X-32X
9	Quantex QP5/200 SM-1	Pentium MMX-200	32	512	3.2	Matrox Mystique 22D	4/SGRAM	15/13.9	.28	12X-16X
10	CyberMax PowerMax	AMD K6-166	32	512	3.2	Matrox Mystique 22D	4/SGRAM	15/13.8	.28	12X-24X
11	Dell OptiPlex Gn+233	Pentium MMX-233	32	512	3.2	S3 Trio64 V2	2/VRAM	15/13.8	.25	12X-24X
12	Midwest Micro Pro 300	Pentium II-300	32	512	6.4	ATI 3D Rage Pro	4/SGRAM	17/16.1	.26	12X-24X
13	CyberMax SuperMax PII 300	Pentium II-300	64	512	8	Diamond Viper V33D	4/SGRAM	17/16	.26	12X-24X
14	Sys Technology Sys Performance 233K6	AMD K6-233	32	512	6.4	Number Nine 9 Revolution 3D	8/WRAM	17/15.9	.26	12X-24X
15	DirectWave MVP VK6-233	AMD K6-233	64	512	7	Diamond Viper V330	4/SGRAM	17/16.1	.26	12X-24X
16	Kingdom Pinnacle M200+ V	Cx6x86MX-PR200	32	512	3.2	Hercules Terminator 3D	4/EDO DRAM	15/13.7	.28	12X-24X
17	Micro Express MicroFlex P900E	Pentium II-233	64	512	3.2	ATI Xpert@Work	4/SGRAM	17/15.8	.28	12X-24X
18	Polywell Poly K6233Mx	AMD K6-233	32	512	5.1	Diamond Stealth 3D 2000	4/EDO DRAM	17/15.6	.28	12X-24X
19	NEC Direction SPL 300	Pentium II-300	32	512	4.3	Diamond Viper V33D	4/SGRAM	15/13.9	.27	14X-32X
20	Micron ClientPro Mre 233	Pentium MMX-233	64	512	3.2	Diamond Stealth 3D 2000	4/EDO DRAM	15/13.5	.28	12X-16X

* Best Buy ¹ PC World defines towers as taller than 20 inches, midtowers as 15.5 inches to 20 inches, and minitowers as less than 15.5 inches.

² Downloads only, uploads at 33.6 kbps; uses 3Com/U.S. Robotics' x2 technology.
³ Downloads only, uploads at 33.6 kbps; uses Rockwell-Lucent's K56flex technology.

WorldBench score of 269, the SM-3x stands among the performance elite.

Compared to what we've seen in other Quantex PCs, the overall interior design of the QP6/300 SM-3x runs true to form: a little disorderly but relatively easy to upgrade. Cables lie in a messy cluster but don't interfere with access to the internal PCI and ISA card slots. Quantex documentation is a little disappointing. The manual includes serviceable illustrations but offers only generic system information, with no particulars provided for the CPU type or model.

However, the company's support policies are among the best. In addition to round-the-clock support, Quantex backs its systems with a three-year warranty for parts and a one-year warranty for labor.

3 GATEWAY 2000 GP5-233

PRO: Affordable multimedia system, good documentation and support

CON: Monitor a bit fuzzy at high resolutions



The \$1874 Gateway 2000 GP5-233 is a stylish and reasonably priced midtower system for the small or home office. This Pentium MMX-233 machine posted a PC WorldBench score of 240—very good for a system in this processor class. The loaded multimedia configuration includes a 12X-24X CD-ROM drive, an Ensoniq Audio PCI sound card, and fine Boston Acoustic speakers with subwoofer. SOHO buyers will welcome the \$99 price drop and the bundled Microsoft Office 97

Small Business Edition software suite. The 17-inch Gateway EV700 display isn't the sharpest we've seen, but it's quite adequate for everyday business tasks. Of course, this non-Pentium II system lacks advanced AGP graphics.

On the whole, the GP5-233 is nicely constructed, although one bit of carelessness surprised us: The wires going from the sound card to the modem and CD-ROM drive were not connected. Gateway includes a quiet keyboard and Microsoft's IntelliPoint mouse.

Gateway's support is top-flight. Besides the three-year warranty on parts and labor, you get round-the-clock phone support and a year of free on-site service.



Gateway 2000 GP5-233

EXPANDABILITY

CUSTOMER SUPPORT

Modem speed (kbps)	Sound board	Case style ¹	Max. RAM (MB)	Maximum secondary cache (KB)	Open RAM sockets	Open drive bays (ext./int.)	Open slots	Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
56 ²	Yamaha OPL3-Sax	midtower	384	512	2	3/1	4	3/1	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ³	integrated	midtower	192	512	1	3/3	4	3/1	24	Sat., Sun.	BBS, WWW
56 ²	Ensoniq Audio PCI	midtower	256	512	1	3/2	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ²	Ensoniq Audio PCI	midtower	256	512	5	3/1	4	varies ⁴ /3	24	Sat., Sun.	BBS, WWW
56 ²	Ensoniq Audio PCI	midtower	384	512	2	3/2	3	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ²	Ensoniq Audio PCI	midtower	384	512	2	3/2	2	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
56 ³	Sound Blaster AWE64	midtower	256	512	2	3/0	3	4/4	24	Sat., Sun.	WWW
56 ³	Ensoniq Audio PCI	midtower	512	512	3	3/1	2	varies ⁴ /3	24	Sat., Sun.	BBS, WWW
56 ³	Ensoniq Audio PCI	midtower	256	512	4	3/2	5	3/1	24	Sat., Sun.	BBS, WWW
56 ²	Ensoniq Audio PCI	tower	384	512	5	3/2	5	3/1	24	Sat., Sun.	BBS, WWW
not included	Creative Labs CT 2960	desktop	256	512	1	0/0	3	3/1	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
not included	Ensoniq Audio PCI	midtower	384	512	2	3/1	5	varies ⁴ /3	12	Sat.	BBS, WWW
not included	none	midtower	384	512	1	3/3	5	3/1	24	Sat., Sun.	BBS, WWW
56 ²	Sound Blaster AWE64	midtower	512	512	5	3/2	3	varies ⁵ /5	24 ⁶	Sat., Sun. ⁶	WWW
56 ³	Sound Blaster AWE64	midtower	256	512	4	3/1	4	3/3	24 ⁷	Sat., Sun. ⁷	BBS, WWW
56 ²	Ensoniq Audio PCI	midtower	256	512	2	3/2	3	varies ⁴ /1	15.5	Sat.	WWW
56 ³	Opti 32W-3D	midtower	512	512	2	3/0	4	4/4	24	Sat., Sun.	WWW
33.6	OEM (CS37W-3DIS/C)	midtower	256	512	5	3/0	4	3/5	24 ⁸	Sat., Sun. ⁸	WWW
56 ²	integrated	midtower	384	512	2	3/0	4	3/3	24	Sat., Sun.	AOL, BBS, CIS, MSN, WWW
not included	Sound Blaster 16 PnP	midtower	256	512	0	3/1	3	3/1	24	Sat., Sun.	BBS, CIS, WWW

¹ Five years on CPU and main RAM, three years on other parts.

² Six years on CPU and main RAM, one to five years on other parts.

⁴ After one year, support drops to 9 hours on weekdays, with no weekend support.

⁷ After one year, support drops to 11 hours per weekday and 7 hours on Saturday.


⁸ After one year, support drops to 10 hours on weekdays and Saturday.

Our readers report that support quality for Gateway desktops is above average, while system reliability rates average.

4 UNICENT AVANTA T233

PRO: Great price for a PMMX-233, good features, long warranty

CON: Relatively slow, documentation hard to read

 If you're looking for a reasonably priced office PC, consider Unicent's \$1849 Avanta T233. A \$250 price cut helps this midtower—which comes loaded with nice features, a good software bundle, and a great warranty—edge into Best Buy territory. Of course, the performance of this PMMX-233 can't keep pace with the Pentium II systems now filtering onto the budget chart.

You get plenty for your money, includ-

ing an Iomega Zip drive, a 6.4GB hard drive, a 56-kbps Sportster x2 voice modem with RapidComm software, and Microsoft Office 97 Professional. We got a snappy, flicker-free picture with the 17-inch Princeton EO75 monitor and Matrox Millennium II graphics card. Our only multimedia complaint: The pair of Premier QX SW32 speakers lacked punch.

The PC's manuals are too technical for most novice users, but support is available around the clock. And when we called the company anonymously, we reached helpful technicians. Unicent's warranty covers the CPU and RAM for five years—above and beyond the norm—and other components and labor for three.



Unicent Avanta T233

5 GATEWAY 2000 G6-233

PRO: Very good performance and design

CON: Small hard drive, skimpy software bundle

 A cascade of price cuts among competing systems pushed the Gateway 2000 G6-233 down the chart a bit this month, but this \$1999 midtower hangs on for a second straight month as a budget Best Buy. With its PII-233 processor, the G6-233 posted a PC WorldBench score of 247, placing it in the middle of the performance pack among budget Best Buy PCs. This basic, well-supported system is a good choice for small-business users who don't mind buying their own applications.

The package is good ►

for a low-cost Pentium II—puny 2.1GB hard drive aside. You get a general-purpose 17-inch monitor (Gateway's EV700), along with STB's Velocity 128 graphics card. This board performed well in our recent AGP graphics card roundup (see "AGP Graphics: A Bumpy Ride," December 1997).

The G6-233 features the same fit and finish found on



Gateway 2000 G6-233

most Gateway PCs. The midtower chassis is attractive and very easy to open. We liked the spacious keyboard and the Microsoft IntelliMouse pointing device;

and Gateway's well-illustrated documentation is among the best. Its support policies are very strong as well, with three-year warranties for parts and labor, as well as 24-hour toll-free tech support.

New This Month

The following PCs made our budget desktops chart for the first time this month. For original reviews of previously tested PCs on the chart, visit our Web page (www.pcworld.com/t20pcs).

8 UNICENT AVANTA L233

PRO: Low price for a Pentium II, outstanding performance, quiet operation

CON: Troublesome support, limited expansion ►

TOP 20 BUDGET DESKTOPS

TEST REPORT



Word 7.0 for Windows 95

Picture Publisher 6.0 for Windows 95


WordPerfect 6.1 for Windows

Excel 7.0 for Windows 95

Paradox 5.0 for Windows

1-2-3 release 5 for Windows

HOW WE TEST All systems are tested with PC WorldBench, PC World's application-based benchmark. A higher PC WorldBench score is better. All PCs have Windows 95, and video resolution is set to 800 by 600 in 256 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 score is a sum of the weighted result of each script: Word (25 percent), Excel (20 percent), Picture Publisher (15 percent), Paradox (15 percent), WordPerfect (15 percent), and 1-2-3 (10 percent). For more details on our benchmark and how we run it, see PC World Online (www.pcworld.com/testing).



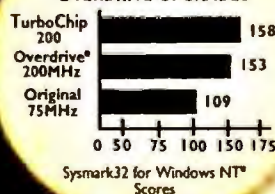
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soon be a multimedia guru. Audio, video, and 3D graphics will scream from your PC. And benchmarks show the 200MHz TurboChip will increase processing performance—for Pentium 75, 90, and 100MHz desktop systems—by up to 250 percent.* One more thing: The TurboChip 200 is a chip-for-chip replacement solution,** so it's easy to install. To find out more, call (800) 588-5517. Or check out our Web site. But do it quickly. After all, your PC isn't getting any younger.

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Circle 133 on reader service card

PC buyers fear obsolescence the way stockbrokers fear market crashes. For \$1899, Unicent's Pentium II-233-based Avanta L233 gives you a little peace of mind, with its AGP-ready motherboard.

Slightly faster than the typical PII-233, the L233 comes with Microsoft Office 97 Professional Edition and a pair of PCI-based video cards. Unfortunately, the video boards don't use the AGP slot, leaving only a single free PCI slot along with one open ISA slot.

The ultraquiet power supply virtually eliminates fan noise—even in a quiet room it was hard to hear the fan running. However, we were vexed when we saw that the drivers for the modem weren't loaded; we had to install them ourselves. And some might be confused by the second power switch on the power supply.

Unicent's support package includes a five-year warranty on the CPU and RAM, three years on other parts, and three years on labor. Tech support is offered 24 hours a day, seven days a week; but we often had to wait at least 10 minutes on hold for help. More troubling, we sometimes received incorrect replies to our queries.

12 MIDWEST MICRO PRO 300

PRO: Superfast, with good speakers and monitor
CON: Expensive, no modem

Last month NEC made a splash by putting the first Pentium II-300 system on our budget chart. Now four PII-300 powerhouses grace our list, including the capable Midwest Micro Pro 300. This \$2169 home-and-office machine put together a terrific PC WorldBench score of 269, without skimping on any of the amenities that home users want.

There's a lot to like about this attractive midtower, including a large 6.4GB hard disk and the highly regarded ATI 3D Rage Pro graphics card. The MAG DJ717 monitor features the nifty JAG dial, which provides mouselike control of on-screen menus. The system also comes with the Microsoft Office 97 Small Business Edition software suite. One unfortunate oversight: The

Midwest Micro Pro 300 lacks a modem.

Midwest Micro did a nice job on the manuals, with useful illustrations, step-by-step upgrade procedures, and ergonomic tips for new users. The company offers a five-year warranty on the CPU and RAM, a three-year warranty for other components, and a three-year labor warranty. Midwest Micro also offers 12 hours of technical support each weekday, plus additional Saturday hours.

16 KINGDOM PINNACLE M200+ V

PRO: Very inexpensive, good expandability
CON: Misformatted hard disk, blurry monitor, lightweight software bundle

Kingdom's \$1197 Pinnacle M200+ V—the least expensive PC on our budget chart—is an entry-level, bargain-basement midtower suitable for home or office use. The Cyrix 6x86MX-PR200 processor powered the Pinnacle to a respectable PC WorldBench score of 236.

Despite its low price, the Pinnacle offers a polished configuration, though the Hercules Terminator 3D PCI graphics card uses 4MB of EDO DRAM, an aging mem-

ory type no longer used on graphics cards. Novice users, be warned: Kingdom formatted the 3.2GB hard drive in our test PC into a pair of 1GB partitions—wasting more than a gigabyte of capacity in the process. Yes, a technically savvy user could reformat and repartition the drive to reclaim the space, but that's not something first-time buyers should have to face. Also, the 15-inch Kingdom 50i monitor produced blurry images.

The Pinnacle comes with Microsoft's Works and Money Productivity Pack, which should appeal to novice users who want to incorporate a PC in their home or office; there is also a selection of reference and educational CD-ROMs.

Kingdom's warranty covers CPU and RAM for five years, other parts for three, and labor for one. Tech support is available nearly 16 hours every day but Sunday.



Unicent Avanta L233



Pinnacle M200+ V



Midwest Micro Pro 300

20 MICRON CLIENTPRO MRE 233

PRO: Affordable, integrated ethernet card

CON: No free DIMM sockets without extra charge
Priced at \$1849, the stylish Micron ClientPro Mre 233 midtower is an affordable, network-ready PC suitable for a range of business uses. The fast 100-megabits-per-second ethernet card includes security features such as a "chassis intrusion system," which transmits an alert when the case is opened. The package also includes a copy of Intel's LAN Desk Client Manager software, which lets IS managers remotely update—and even turn on—PCs in the network.

With its Pentium MMX-233 CPU, the ClientPro Mre 233 delivered a strong PC WorldBench score of 237. Multimedia fans may not like the tinny-sounding Jazz J-201 speakers, but the sound is fine for business use. The system comes with

Microsoft Office 97 Small Business Edition, but the system documentation is not for consumers—it lacks specific information about this particular configuration.


Micron ships the Mre 233 with 64MB of SDRAM mounted on two DIMMs, filling both available sockets. To add more memory, you must either remove RAM to make room for a larger DIMM or pay an extra \$49 when you order the system to get your SDRAM on a single DIMM, which frees up a slot.

Micron's support is attractive, with a three-year parts, one-year labor warranty that includes one year of free on-site support. The company offers round-the-clock toll-free phone support. ▶



ClientPro Mre 233

Beyond the Top 20: Online

 We evaluated these systems along with the others, but they didn't score high enough to reach the Top 20 Budget Desktops chart. For write-ups, see PC World Online (www.pcworld.com/t20pcs).

- ◆ Acma EXP Pro 266L
- ◆ NEC Direction SPL 266
- ◆ Netis Starburst 266
- ◆ Racer Daytona 233 GT
- ◆ Tatung TCS 5980

CAN YOU REALLY AFFORD TO HAVE A SMALL HARD DRIVE?



Cost: 2 gigabytes

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www.3com.com/56k.



TOP 10 NOTEBOOK PCs

POWER NOTEBOOKS		Last month	Month tested	Street price (1/9/98)	CPU	Comments
1	 Gateway 2000 Solo 2300XL 800/315-2536 www.gateway.com	2	Dec 97	\$3299	Pentium MMX-233	Leapfrogs Micron TransPort after \$300 price cut; slow 10X CD-ROM drive.
2	Micron TransPort XKE 233 888/634-8799 www.micronpc.com	1	Feb 98	\$4448	Pentium MMX-233	Huge hard drive, has both touchpad and eraserhead; heavy.
3	Dell Inspiron 3000 M266XT 800/388-8542 www.dell.com	n/a	NEW	\$3299	Pentium MMX-266	Fastest notebook ever, good price; no modem.
4	Quantex H 1330 800/896-4898 www.quantex.com	5	Mar 98	\$3149	Pentium MMX-233	Rises a notch after \$450 price cut, strong battery; no docking station option.
5	Dell Latitude CP M233ST 800/388-8542 www.dell.com	3	Jan 98	\$3499	Pentium MMX-233	\$200 price drop on fast notebook, very light weight; no modem.
BUDGET NOTEBOOKS						
1	 Micron Meridian 888/643-8799 www.micronpc.com	n/a	NEW	\$2399	Pentium MMX-166	Fastest budget unit we've tested, light; no docking station option.
2	Acer Extensa 391C 800/733-2237 www.acer.com/aac	1	Mar 98	\$1999	Pentium MMX-133	\$200 price hike, long battery life; poor-quality screen for graphics.
3	AMS Tech Travel Pro 106CS 800/886-2671 www.amstech.com	n/a	NEW	\$1835	Pentium MMX-166	Good price, three-year warranty; hazy screen for graphics.
4	Quantex H 1210 800/896-4898 www.quantex.com	n/a	Jan 98	\$2299	Pentium MMX-166	Very good performance, light weight; no port covers.
5	Toshiba Satellite 225CDS 800/334-3445 www.computers.toshiba.com	4	Nov 97	\$1599	Pentium-133	Well designed, low price; tech support free for only one year.



Best Buy

See features chart, page 228.

n/a = not applicable ¹ Includes computer, adapter, power cord, and floppy drive or CD-ROM drive. ² For more information about all products in this table, circle reader service no. 901.



WHAT DO INTEL'S ADVERTISING blitzkrieg and the less-than-thrilling performance of the new Pentium MMX-266 notebooks have in common? Plenty.

A few years ago, before "Intel Inside" became as popular as a Nike slogan, the chip maker's newly released CPUs tended to be much faster than their immediate predecessors. But with the introduction of Pentium processors, Intel's strategy changed, says Linley Gwennap, senior analyst at the research firm MicroDesign Resources.

It began marketing CPUs like athletic shoes. "Intel realized that to grow the market, it had to appeal directly to end users, offering something new and hot at all times," says Gwennap. This involved not only many millions of dollars in advertising hype, but more product turnover. New processors started rolling out with much greater frequency—about one per quarter. But there is a catch: Most new CPUs have been only marginally faster than their predecessors.

So it goes with Intel's new Pentium

MMX-266 for notebooks. We tested our first PMMX-266 portable—Dell's Inspiron 3000 M266XT—and were not impressed with the performance. The notebook was faster than our top PMMX-233 portable, but only by a hair. Still, this speed plus a good \$3299 price propelled the M266XT—one of ten portables tested this month—onto the power chart.

On the budget side, two new notebooks and one we tested in January hit the chart due mostly to the trickle-down effect. With the introduction of the PMMX-266

processor, prices on PMMX-166-based portables are dropping enough to qualify them for the budget chart. (The cost of notebooks in general is falling for another reason: a glut of 12.1-inch active-matrix displays on the market.)

The new chart makers—the Micron Meridian, the AMS Tech Travel Pro 106CS, and the Quantex H 1210—are powered by PMMX-166s, providing great performance for reasonable prices.

POWER NOTEBOOKS

This Month's Best Buy

1 GATEWAY 2000 SOLO 2300XL

PRO: Breakneck speed, longest-lasting battery, good software bundle

CON: Slow CD-ROM drive, slippery keyboard



The Gateway 2000 Solo 2300XL has been running neck and neck with the Micron TransPort XKE 233 for the top spot on our power chart since February. Last month the Micron—a fully loaded and expensive multimedia

SCORECARD

★ Overall rating	PC WorldBench score/performance	Price	Vendor's system reliability	Features and design	Vendor's support quality/policies	Battery life (hours:min)/rating	Traveling weight ¹	Reader service number ²
89	244/outstanding	inexpensive	average	outstanding	below average/fair	8:51/outstanding	average	601
88	241/very good	expensive	above average	outstanding	3/fair	8:11/outstanding	heavy	602
88	250/outstanding	inexpensive	average	very good	average/fair	5:26/very good	average	603
86	239/very good	inexpensive	³	outstanding	3/fair	5:53/very good	average	604
85	241/very good	average	average	very good	average/fair	4:38/good	light	605
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	
90	220/outstanding	average	above average	very good	3/fair	5:54/very good	light	606
88	204/very good	inexpensive	³	very good	3/fair	5:50/very good	light	607
84	197/good	very inexpensive	³	good	3/fair	3:28/good	average	608
84	206/very good	average	³	very good	3/fair	3:20/good	light	609
82	165/satisfactory	very inexpensive	average	good	below average/fair	3:19/good	average	610
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	

³ Insufficient data to give a rating.

machine—took the lead for the first time. Now a \$300 price drop to \$3299 makes the Gateway our Best Buy once again.

And for good reason. It has nearly all the qualities we like in a laptop, including knockout speed, long battery life, and a great selection of software. The Solo 2300XL delivered an exceptional PC WorldBench score of 244, which until this month made it the fastest notebook to pass through our doors. (The new Dell Inspiron 3000 M266XT, in third place, is now our fastest.) Surprisingly, along with the great performance comes long battery life: The Solo 2300XL's lithium ion cell lasted for almost 9 hours.

This solidly built system also comes with a handsome collection of features, including a 3Com/U.S. Robotics 56-kilo-bits-per-second PC Card modem. Built-in speakers produce clear, crisp sound, though it becomes distorted when you crank up the volume. Gateway also pro-



Gateway Solo 2300XL

vides small headphones, in case you want to listen to audio CDs or play CD-ROM games when people around you prefer quiet.

The Solo's 12.1-inch active-matrix screen is slightly smaller than average for a power notebook these days, but it looks good. The system has a good-size keyboard and a responsive touchpad pointing device. However, we found the keys a little flat and slippery when we typed.

Like all Gateway systems, this unit comes with a comprehensive manual that provides helpful, well-labeled photos and an index for quick reference.

PC World readers have rated Gateway's system reliability as average, and find the quality of its technical support, which is available around the clock, to be lacking. The company backs its notebooks with a typical one-year warranty on both parts and labor.

New This Month

The following PC made our power notebooks chart for the first time this month. For original reviews of previously tested PCs on the chart, visit our Web page (www.pcworld.com/t20pcs).

3 DELL INSPIRON 3000 M266XT

PRO: Speed demon, healthy battery life

CON: No modem, skimpy software package

This month, the new Dell Inspiron 3000 M266XT broke the speed record for notebooks with a PC WorldBench score of 250.

Designed for small-business users, this portable is powered by Intel's latest engine for notebooks, the Pentium MMX-266. But the Dell barely outperformed our former champ, the Gateway 2000 Solo

2300XL. The margin of victory over that PMMX-233 notebook was less than 3 percent—a performance boost most users wouldn't even notice.

What really stands out on the sleek black Inspiron ►



Inspiron 3000 M266XT

	POWER NOTEBOOKS	CPU	Traveling weight (pounds) ¹	RAM (MB)	Hard drive (GB)	Color screen type	Screen diagonal (inches)	Screen resolution	Maximum screen colors	Battery type	Pointing device
1	Gateway 2000 Solo 2300XL*	Pentium MMX-233	7.8	32	3	active	12.1	800 x 600	65,536	lithium ion	touchpad
2	Micron TransPort XKE 233	Pentium MMX-233	9.2	64	5	active	13.3	1024 x 768	65,536	lithium ion	touchpad, eraserhead
3	Dell Inspiron 3000 M266XT	Pentium MMX-266	7.4	32	2.1	active	13.3	1024 x 768	16.8 million	lithium ion	touchpad
4	Quantex H 1330	Pentium MMX-233	7.8	32	3	active	13.3	1024 X 768	16.8 million	lithium ion	touchpad
5	Dell Latitude CP M233ST	Pentium MMX-233	6.8	32	3.2	active	12.1	800 x 600	16.8 million	lithium ion	touchpad
BUDGET NOTEBOOKS											
1	Micron Meridian*	Pentium MMX-166	7.2	32	2.1	active	12.1	800 x 600	65,536	NiMH	touchpad
2	Acer Extensa 391C	Pentium MMX-133	7.2	32	1.6	dual-scan	12.1	800 x 600	65,536	NiMH	touchpad
3	AMS Tech Travel Pro 106CS	Pentium MMX-166	8.4	16	1.4	dual-scan	12.1	800 x 600	65,536	NiMH	touchpad
4	Quantex H 1210	Pentium MMX-166	7.2	16	2.1	active	12.1	800 x 600	65,536	lithium ion	touchpad
5	Toshiba Satellite 225CDS	Pentium-133	7.8	16	1.3	dual-scan	12.1	800 x 600	65,536	lithium ion	eraserhead

*Best Buy ● Yes ○ No ¹ Includes computer, adapter, power cord, and floppy drive or CD-ROM drive.

² Downloads only, uploads at 33.6 kbps; uses 3Com/U.S. Robotics' x2 technology.

3000 is its \$3299 price. That's very good for a portable with a large 13.3-inch screen.

But to keep the price down, Dell skimped on the rest of the system. The 2.1GB hard drive is relatively small, though it will easily hold your company's office suite. Besides Windows 95, the Inspiron 3000 comes with only one application: Microsoft's Internet Explorer 4.0.

In the age of the Internet, Dell also should have had the good sense to include a modem. The notebook's other shortcomings are typical of portables today: The stereo speakers were stressed when playing audio CDs—the treble sounded overdriven and the bass was muffled. In addition, Dell didn't supply covers for the rear ports, exposing them to possible nicks and dings. And when we typed on the keyboard, it felt like soft clay.

At 7.4 pounds, the Inspiron travels well. It lasted nearly 5.5 hours with only one battery installed. The floppy disk and CD-ROM drive share a bay and can be removed to make room for a second battery, giving you plenty of juice on the road.

Dell's system reliability is average compared with that of other notebook makers. The company offers the usual one-year parts and labor warranty.



Micron Meridian


BUDGET NOTEBOOKS

This Month's Best Buy

1 MICRON MERIDIAN

PRO: Fast, multipurpose

CON: Low sound volume, poor design features

 The \$2399 Micron Meridian is a classic utility player—able to do a solid job in all areas of notebook computing without a lot of pomp.

The black Meridian has an art deco look, with a rounded front end. Powered by a PMMX-166, the Meridian is the fastest budget notebook we've run through our mill. At the office, you'll appreciate this high performance when working with large applications. But Micron doesn't include any software besides Windows 95.

The Micron Meridian will also perform well on the road. A traveling companion shouldn't be a burden, and the system's 7.2-pound weight means it's lighter than many notebooks. Nor does it chain you to

the AC adapter; in our test the nickel-metal hydride battery lasted for just under 6 hours—an impressive feat.

We have a few design concerns. Micron uses a single latch to hold the battery in place beneath the notebook;

the standard side bay design is easier to use. Also unusual are the small vent holes running vertically along each side of the keyboard—they're just the right size to trap crumbs from your lunch.

Otherwise, we particularly like the easy-to-find LCD status readout on the screen's center hinge. Moreover, the touchpad was the most accurate we've seen, with no ghosting or pointer drift.

Micron's system reliability is above average. We called the company twice to assess its around-the-clock tech support. The hold time for each call was 13 minutes—not exactly quick.

New This Month

The following PCs made our budget notebooks chart for the first time this month. For original reviews of previously tested PCs on the chart, visit our Web page (www.pcworld.com/t20pcs).

3 AMS TECH TRAVEL PRO 106CS

PRO: Very affordable, long three-year parts and labor warranty

CON: Hazy screen for graphics, no tech support on weekends

If you're looking for a low-price notebook that's well equipped to handle word processing and Web surfing, consider AMS Tech's new Travel Pro 106CS.

EXPANDABILITY

CD-ROM drive speed	Modem speed (kbps)	Maximum RAM (MB)	Modular expansion bays	Bay for second battery	Optional docking station	Infrared port
10X	56 ²	192	1	○	●	●
12X-20X	56 ³	192	2	●	●	●
12X-20X	not included	144	1	●	○	●
12X-20X	33.6	144	1	●	○	●
12X-20X	not included	128	1	●	○	●
12X-20X	33.6	40	1	○	○	●
12X-20X	33.6	128	0	○	●	●
14X-20X	33.6	80	1	●	●	●
12X-20X	33.6	144	1	●	●	●
10X	not included	144	1	●	●	●

CUSTOMER SUPPORT

Warranty for parts/labor (years)	Weekday toll-free support (hours)	Weekend support	Online support
1/1	24	Sat., Sun.	AOL, BBS, CIS, WWW
1/1	24	Sat., Sun.	BBS, CIS, WWW
1/1	24	Sat., Sun.	BBS, WWW
varies ⁴ /1	24	Sat., Sun.	BBS, WWW
1/1	24	Sat., Sun.	BBS, WWW
1/1	24	Sat., Sun.	BBS, CIS, WWW
1/1	24	Sat., Sun.	BBS, CIS, WWW
3/3	11	none	BBS, CIS, WWW
varies ⁴ /1	24	Sat., Sun.	BBS, WWW
1/1	24	Sat., Sun.	BBS, CIS, MSN, WWW

² Downloads only, uploads at 33.6 kbps; uses Rockwell-Lucent's K56flex technology.

⁴ Three years on CPU and RAM, one year on other parts.



Travel Pro 106CS

An \$1835 price tag is very reasonable for a machine carrying a Pentium MMX-166 processor. You'll have plenty of power to run your software,

which you have to buy separately (except for Windows 95) and load on the 1.4GB hard drive.

As a road machine, the black and boxy Travel Pro has several notable strengths, including a 33.6-kbps PC Card modem. And though the portable's 8.4-pound weight makes it somewhat heavy for long trips, the nickel-metal hydride battery lasted an adequate 3.5 hours in our test.

Our biggest complaint is the mediocre 12.1-inch dual-scan screen. While black letters on a white background were easy on our eyes, the color graphics were somewhat dark and grainy.

The notebook has clear-sounding built-in stereo speakers and a fast 14X-20X CD-ROM drive. The Travel Pro is designed with one modular bay for swapping the floppy and CD-ROM drives.

While we don't have enough data to judge AMS Tech's system reliability or support quality, the company has been

designing and manufacturing nothing but notebooks for 12 years. AMS Tech backs its products with an outstanding three-year parts and labor warranty, but its tech support hours—just 11 hours per weekday—are a little short. Nonetheless, when we called the company's tech support lines, friendly representatives were available immediately; and their advice was mostly sound.

4 QUANTEX H 1210

PRO: Very good performance, crisp display

CON: Too much screen and keyboard flex

The \$2299 Quantex H 1210 is an affordable notebook that will serve you well both at the office and on the road. Powered by a PMMX-166 processor, the H 1210 chalked up a very respectable PC WorldBench score of 206 in our January tests. You'll get better performance by upgrading the 16MB of RAM to 32MB.



Quantex H 1210

This slim, 7.2-pound notebook comes with a 33.6-kbps PC Card modem. The power pack, which has a useful charge indicator on its face, can live divorced from AC outlets for a respectable but not marathon 3.3 hours. If you fly across the country frequently, you might want to spend another \$169 for a second


battery that slips into the Quantex H 1210's single modular bay.

Like an increasing number of budget notebooks, this one comes with an active-matrix display. We found the picture sharp but had a problem with glare when we viewed it from any angle but dead-on.

We didn't care much for the H 1210 keyboard's spongy feel. Its function keys are smaller than normal, too.




We don't have enough reader survey data to judge Quantex's service quality or the reliability of its notebooks (the company has been in the notebook business less than one year). Calls made to the company for support turned up friendly and knowledgeable technicians; the only problem we ran into was being put on hold once and forgotten—for an hour. ■

Beyond the Top 10: Online

 We evaluated these systems along with the others, but they didn't score high enough to reach the Top 10 Notebook PCs chart. For write-ups, see PC World Online (www.pcworld.com/t20pcs).

- ◆ AMS Tech Rodeo 5000ECX
- ◆ ARM TS5027
- ◆ AST M5230X
- ◆ Compaq Armada 7790DMT
- ◆ NEC Versa 2780MT
- ◆ NEC Versa 5060X
- ◆ WinBook K6266MMX

TOP 10 HOME PCs

POWER SYSTEMS		Last month	Month tested	Street price (1/9/98)	Comments
1	 Dell Dimension XPS D300 800/388-8542 www.dell.com	2	Mar 98	\$2629	PRO: Superfast power system, first-class reliability and support ratings. CON: Pretty expensive, limited software package, so-so setup.
2	Gateway 2000 G6-233h 800/846-2000 www.gateway.com	1	Jan 98	\$2158	PRO: Very fast, cheapest PC on power chart, excellent setup, hefty mix of software titles. CON: Average reliability rating.
3	Micron Millennia XKU 300 888/634-8799 www.micron.com	n/a	NEW	\$3498	PRO: Extremely fast, jam-packed with gaming features, large monitor, top-notch reliability and support ratings. CON: Superpricey—the most expensive PC on power chart.
4	Micron Millennia Mme with Fusion 3D 888/634-8799 www.micron.com	3	Oct 97	\$2278	PRO: First-rate reliability and support ratings, great price. CON: Slowest machine on power chart.
5	Gateway 2000 G6-333h 800/846-2000 www.gateway.com	n/a	NEW	\$2903	PRO: Fastest home system to date, large monitor and hard drive. CON: On the expensive side, so-so reliability rating.
BUDGET SYSTEMS					
1	 Dell Dimension XPS D233c 800/388-8542 www.dell.com	1	Mar 98	\$1829	PRO: Fastest machine on budget chart, great reliability and service ratings. CON: Expensive budget system, skimpy software bundle, average setup.
2	Gateway 2000 G5-200 800/846-2000 www.gateway.com	2	Mar 98	\$1499	PRO: Low price, includes color printer, a terrific bargain. CON: Doesn't have the power for demanding multimedia titles, only average reliability rating.
3	Quantex QP5/233 M-2 800/869-4898 www.quantex.com	3	Jan 98	\$1329	PRO: Fast for a budget PC, very good price (recent \$170 price drop), very clear setup instructions. CON: Mediocre software bundle, lesser-known manufacturer.
4	IBM Aptiva E16 800/426-7235 www.ibm.com/pc/us/ibmhome	n/a	NEW	\$1048	PRO: Very low price for an IBM machine, cheapest PC on budget chart. CON: Performance a little slower than average for a K6-166, small monitor, disappointing range of software titles.
5	Packard Bell Multimedia S606 800/733-5858 www.packardbell.com	n/a	NEW	\$1398	PRO: Very reasonably priced, user-friendly interface, easy setup. CON: Performance sluggish for PMMX-233, slowest machine on budget chart.
 Best Buy					

n/a = not applicable



FINALLY! Some sub-\$1000 PCs from big-name computer companies have arrived, and at least one of them is powerful enough to make this month's Home PCs budget chart. Similarly affordable systems from smaller companies like Acer and Monorail have been on the market since last summer. But this month we received two new systems from giants IBM and Hewlett-Packard—both priced at \$799 without a monitor. The Aptiva E16, Big Blue's first-ever ultracheap PC, snatches the fourth spot on this month's budget list.

However, the shipping version of HP's Pavilion 3260 came too late for review this month (see also April's *Top of the News*).

So, what do you sacrifice with a cheap PC? Racehorse speed and multimedia treats. Sub-\$1000 PCs typically come with less memory, small monitors (or no monitor), cheaper speakers, and less room to grow. Still, these budget PCs can handle home office apps, many entertainment titles, family finance, and Net surfing. But if you want to run out-of-this world games, you'll have to look at a more expensive PC.

POWER SYSTEMS

SUPERLATIVE RELIABILITY and support ratings combined with blistering speed place the Dell Dimension XPS D300 in this month's top power spot. Its 300-MHz Pentium II processor earned it a PC WorldBench score of 270.

And given the system's \$2629 price, you pay for that speed. But the XPS D300 is worth it if you're serious about building a home office that can tackle

your most demanding applications.

Like Dell's first-place system, the number two Gateway 2000 G6-233h is definitely a home office workhorse. The \$2158 machine performs a little slower than Dell's D300, but if you're not hankering for the fastest computer around, you can save yourself several hundred dollars.

At number three is Micron's new Millennia XKU 300. It's the luxury machine for the gaming fanatic—at nearly \$900 more than Dell's number one PC. But that \$3498 price buys you super speed and tons of cool gaming goodies—including a Microsoft SideWinder joystick, a ThrustMaster game pad, high-quality speakers from Cambridge Soundworks, a 19-inch monitor, and a DVD-ROM drive. You'll be whisked into gamer's paradise with titles like Silent

Steel, Jane's Longbow, and Command and Conquer.

The fourth power system is Micron's Millennia Mme with Fusion 3D. At \$2278, it's the only non-Pentium II system to win a spot on



Gateway 2000 G6-333h

SCORECARD

★ Overall rating	PC WorldBench score/rating	Price	Reliability/support	Setup	Features	Reader service number
90	270/outstanding	expensive	above average/above average	fair	Pentium II-300, 32MB of SDRAM, 6.4GB hard drive, DVD-ROM drive, 56-kbps fax-modem, 17-inch monitor, AGP graphics card.	611
90	255/outstanding	average	average/above average	outstanding	Pentium II-233, 32MB of RAM, 4GB hard drive, DVD-ROM drive, 56-kbps fax-modem, 17-inch monitor, AGP graphics card, Iomega Zip drive.	612
89	266/outstanding	very expensive	above average/above average	good	Pentium II-300, 64MB of RAM, 8GB hard drive, 2X DVD-ROM drive, 56-kbps fax-modem, 19-inch monitor, AGP graphics card, Iomega Zip drive, joystick, game pad.	613
89	241/very good	average	above average/above average	good	Pentium MMX-233, 32MB of RAM, 3.1GB hard drive, 12X DVD-ROM drive, 56-kbps fax-modem, 17-inch monitor, Iomega Zip drive.	614
88	276/outstanding	expensive	average/above average	outstanding	Pentium II-333, 32MB of RAM, 8.4GB hard drive, 13X-32X CD-ROM drive, 56-kbps fax-modem, 19-inch monitor.	615
Power scorecard weightings	Performance 30 percent	Price 15 percent	R/S 40 percent	Setup 5 percent	Features 10 percent	
89	255/outstanding	expensive	above average/above average	fair	Pentium II-233, 32MB of RAM, 4GB hard drive, 14X-32X CD-ROM drive, 56-kbps fax-modem, 15-inch monitor, AGP graphics card.	616
88	213/fair	inexpensive	average/above average	outstanding	Pentium MMX-200, 16MB of SDRAM, 2GB hard drive, 12X-24X CD-ROM drive, 56-kbps modem, 15-inch monitor, Canon BJC 250 color bubble jet printer.	617
87	237/good	inexpensive	average/average	outstanding	Pentium MMX-233, 32MB of RAM, 3.2GB hard drive, 12X-24X CD-ROM drive, 56-kbps fax-modem, 15-inch monitor.	-
87	205/fair	very inexpensive	average/average	good	AMD K6-166, 16MB of SDRAM, 2GB hard drive, 12X-20X CD-ROM drive, 56-kbps fax-modem, 14-inch monitor.	618
84	197/fair	inexpensive	average/average	outstanding	Pentium MMX-233, 32MB of RAM, 4.2GB hard drive, 12X-20X CD-ROM drive, 56-kbps fax-modem, 15-inch monitor.	619
Budget scorecard weightings	Performance 15 percent	Price 30 percent	R/S 40 percent	Setup 5 percent	Features 10 percent	All products: 902

the power list. Still, a PC WorldBench score of 241 is anything but slow—it's near Pentium II territory. But this Millennia was introduced last fall, so it may not be available much longer.

Stand back. If you *do* have to have the fastest PC in the neighborhood, there's only one system you want: Gateway's new G6-333h. Equipped with a 333-MHz Pentium II CPU and 32MB of RAM, the G6-333h clocked a sweltering 276 on the PC WorldBench test suite. The G6-333h will set you back \$2903, but a 19-inch monitor and an 8.4GB hard drive will soften the sting.

BUDGET SYSTEMS

DELL'S \$1829 DIMENSION XPS D233c snags the number one budget slot for the second month in a row. A good choice for a growing home office, it has Pentium II power but only a 15-inch monitor. Dell's 24-month lease program can ease the cash-flow worries of small-business owners, especially if the company Visa card is



Dell Dimension XPS D233c

in danger of maxing out.

At number two is a complete package, Gateway's G5-200. It's easy to set up, has ample speed for basic tasks, and comes with Canon's BJC 250 color printer. You'll want to avoid playing speed-of-light games or printing piles of color pages, but at \$1499, the G5-200 is a great deal for the small business or the family with its eye on the Internet.

If your main need is cheap speed, the third-place QP5/233 M-2 from Quantex is your best bet. The \$1329 PC is the speediest budget Pentium MMX system we've seen. If you want to play fast games and do some office work on a budget machine, this is the one for you.

IBM's Aptiva E16, a low-cost PC for budget-conscious households or first-time buyers, lands in fourth place. This \$1048 machine sports an AMD K6 CPU (branded by IBM) that performs like a Pentium MMX-166 and is fine for word processing, home finance, or surfing the Net. It comes

with Lotus SmartSuite 97 and Netscape Navigator 3.0, but not a whole lot more.

Brand-new this month is Packard Bell's Multimedia S606, in the fifth spot. The \$1398 S606 is a beginner's PC with clear-cut setup instructions and a friendly interface. It's a little slower than IBM's Aptiva E16, but it does come with a ton of family software titles. Packard Bell, however, has a long history of poor customer service. Judging by our recent calls to tech support, the service seems to have improved, but be prepared to do your own troubleshooting.

—Kirk Steers

Kirk Steers is a contributing editor for PC World. Testing performed by Ulrike Diehlmann of the PC World Test Center.

Beyond the Top 10: Online

We evaluated the following systems along with the others, but they didn't score high enough to reach the Top 10 Home PCs power list. For write-ups, see PC World Online (www.pcworld.com/t10homepcs).

◆ HP Pavilion 8190

◆ IBM Aptiva S62

The innovative all-day, single-battery *notebook. Good news for those*
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If "on the road again" is your life, and
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solution for you. Its innovative power-
management
technology
adapts to your
own usage, giv-
ing you all-day
computing
power without

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with MMX™ technology
- 32MB SDRAM
- 3.2GB or 4.1GB hard disk drive
- 12.1" or 13.3" (diagonal)
SVGA and XGA TFT displays
- 20X (max.) CD-ROM
- USB port • Fast infrared
- Windows® 95

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prices start at just \$2999*. No wonder
Acer is the world's 3rd largest PC
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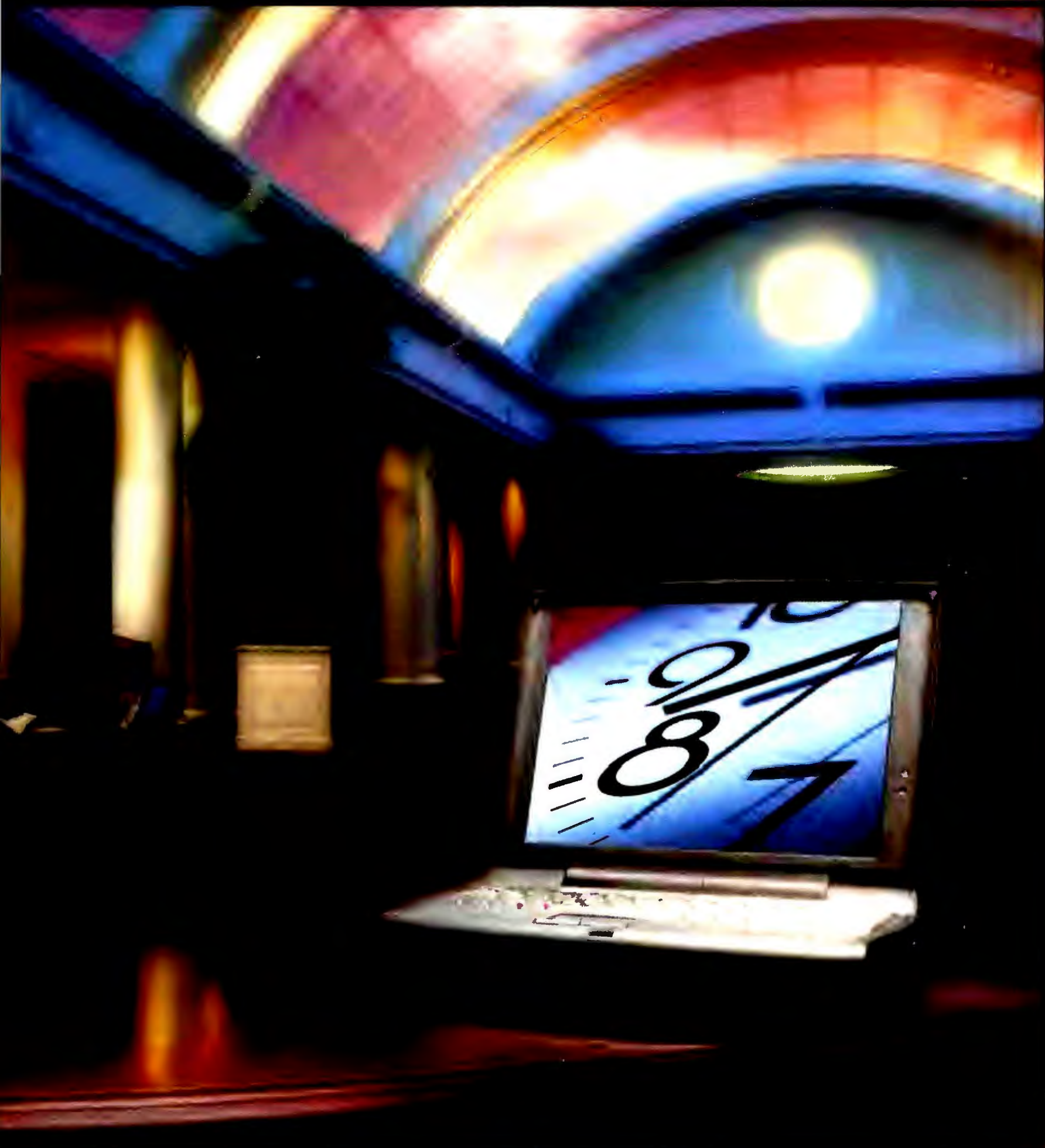


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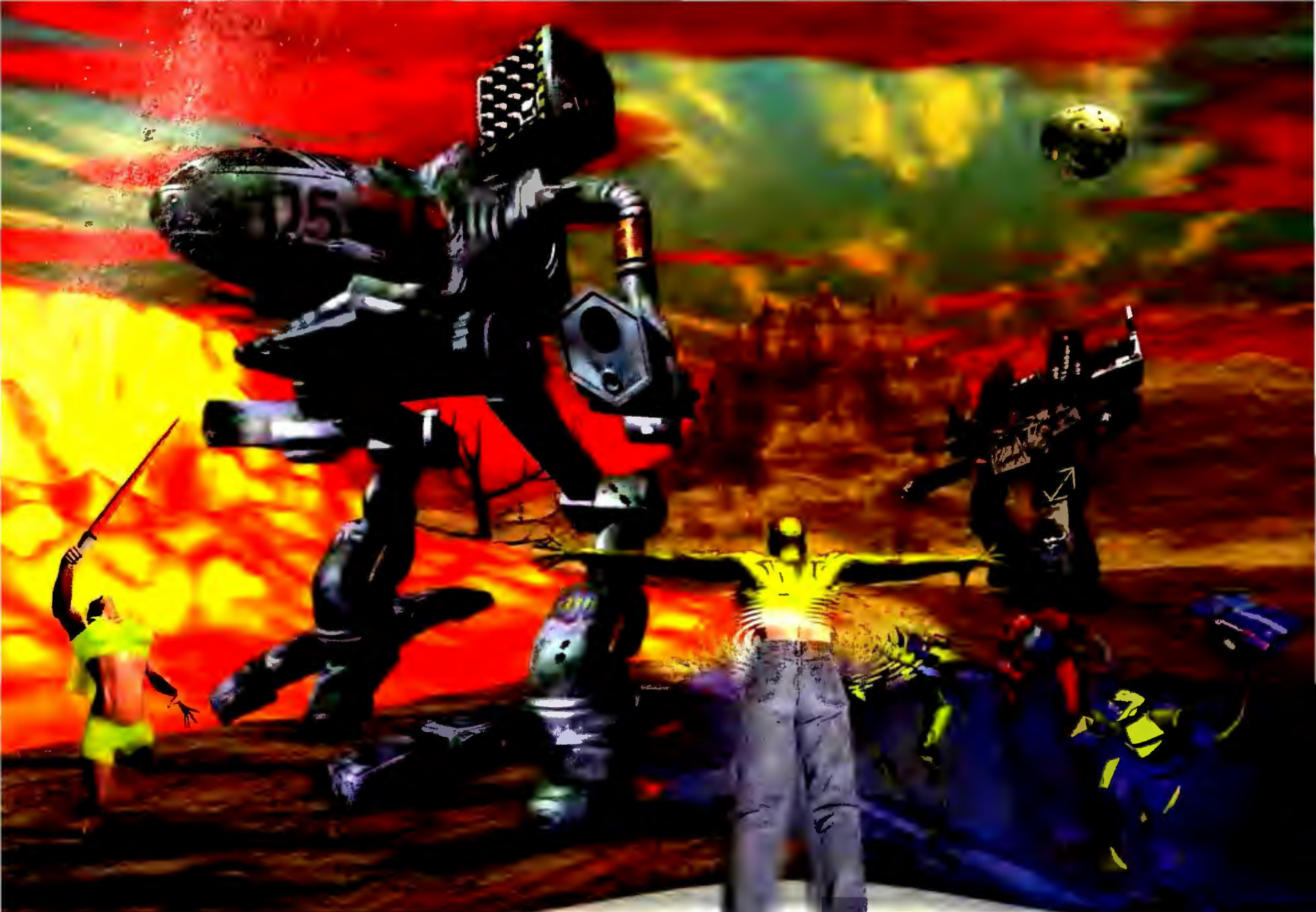
*Who live on commission. And, those who manage them.
Manufacturer?*

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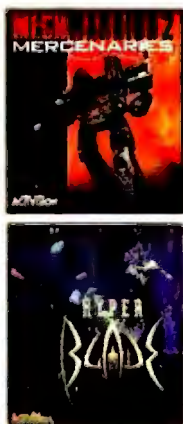
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"The Nitro 3D's low price, solid 2-D performance, excellent 3-D acceleration, and good software bundle make it a smart choice."
—ComputerLife, August 1997

"The board's overall solid performance, useful documentation and Vision 95 utility all add up to great graphics punch for the price."
—Windows Magazine, August 1997

"Good news for gamers: The first-place Best Buy STB Nitro 3D makes 3-D faster and smoother." —PC World, July 1997



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TOP 10 PRINTERS

	MONOCHROME PERSONAL PRINTERS	Month tested	Street price (1/15/98)	Overall rating	Speed for plain text (ppm)	Speed for full-page graphics (ppm)	Comments	Reader service number
1	 Minolta PageWorks 6L 888/264-6658 www.minoltaprinters.com	Dec 97	\$299	84	5.2	3.2	 FEATURES: 6-ppm laser. Standard 256KB of RAM, 600-by-600-dpi maximum resolution, 150 sheets input, 100 output. PRO: Pretty good text quality, easy to use, sturdy construction despite small size, good CD-ROM bundle, low price. CON: Gray scales are a little fuzzy and dark, amount of RAM is fairly small.	730
2	NEC SuperScript 860 800/632-4636 www.nec.com	Dec 97	\$349	83	7	3.4	 FEATURES: 8-ppm laser. Standard 1MB of RAM, 600-by-600-dpi maximum resolution, 200 sheets input, 50 output. PRO: Blistering text speed, easy to create booklets and more, two-year warranty. CON: Blotchy gray-scale graphics, collates pages in reverse order.	731
3	NEC SuperScript 660plus 800/632-4636 www.nec.com	Dec 97	\$199	82	5.2	3.3	 FEATURES: 6-ppm laser. Standard 256KB of RAM, 600-by-600-dpi maximum resolution, 150 sheets input, 100 output. PRO: \$50 off already low price, includes CD-ROM of fonts and clip art, prints exit in correct order (unlike with 860 model), quiet. CON: Inadequate documentation, wrinkles envelopes.	732
4	HP LaserJet 6Lse 800/752-0900 www.hp.com	Dec 97	\$399	81	5.1	2	 FEATURES: 6-ppm laser. Standard 1MB of RAM, 600-by-600-dpi maximum resolution, 100 sheets input and output. PRO: Strong print quality and paper handling, convenient design, excellent manual. CON: Expensive, slowest text speed on monochrome chart, software bundle is not very useful.	733
5	Lexmark Optra E+ 800/539-6275 www.lexmark.com	Feb 98	\$399	80	5.4	1.6	 FEATURES: 6-ppm laser. Standard 2MB of RAM, 600-by-600-dpi maximum resolution, 150 sheets input, 100 output. PRO: Good print quality (especially with text), good documentation, toll-free technical support. CON: Expensive, slowest graphics speed on monochrome chart.	734
COLOR PERSONAL PRINTERS								
1	 Canon BJC-4300 800/848-4123 www.ccsi.canon.com	Dec 97	\$199	83	2	0.3	 FEATURES: 5-ppm monochrome/2-ppm color ink jet. 720-by-360-dpi maximum resolution, 100 sheets input and output. PRO: Low price, prints fine on plain paper, very good results on ink jet stock, great manual and software, easy to install and use. CON: Text a bit fuzzy, second-slowest printer on color chart.	735
2	Canon BJC-7000 800/848-4123 www.ccsi.canon.com	Dec 97	\$399	82	2.3	0.3	 FEATURES: 5-ppm monochrome/3.5-ppm color ink jet. 1200-by-600-dpi maximum resolution, 130 sheets input and output. PRO: \$50 price drop, good overall print quality, impressive color on coated paper, nice CD-ROM of extras, excellent manual. CON: Confusing driver interface, noisy, expensive.	736
3	Epson Stylus Color 800 800/463-7766 www.epson.com	Dec 97	\$399	80	3.8	1.1	 FEATURES: 8-ppm monochrome/7-ppm color ink jet. 1440-by-720-dpi maximum resolution, 100 sheets input, 30 output. PRO: Two-year warranty, includes serial port and network and PostScript options, vivid color, fastest graphics printing on color chart. CON: Gray scales look harsh, expensive.	737
4	HP DeskJet 722C 800/752-0900 www.hp.com	Dec 97	\$349	78	4.1	0.3	 FEATURES: 5-ppm monochrome/1.5-ppm color ink jet. 600-by-600-dpi maximum resolution, 100 sheets input, 50 output. PRO: Very easy to use, quiet, great text quality on plain paper, very fast with text. CON: No toll-free tech support, documentation is somewhat disorganized.	738
5	Canon BJC-4550 800/848-4123 www.ccsi.canon.com	Feb 98	\$299	78	1.9	0.3	 FEATURES: 5-ppm monochrome/2-ppm color ink jet. 720-by-360-dpi maximum resolution, 100 sheets input and output. PRO: Fairly inexpensive, prints 11-by-17-inch documents, sturdy design, good text quality. CON: Graphics lack subtlety, slowest printer on color chart.	739
 Best Buy  Windows 95-certified Plug and Play All products: 909								

HOW WE TEST The overall rating for both monochrome and color personal 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.



THE BIG THREE PRINTER MAKERS—Canon, Epson, and Hewlett-Packard—have been resting on their laurels with massive ad campaigns but few new products. Meanwhile, some

of the smaller, quieter companies have been busy shipping new models. We hoped that these lesser-known vendors would impress us with their fresh offerings; instead, the printers we saw from Kyocera, Lexmark, and NEC didn't meet the chal- ▶

lenge. None makes our chart this month.

Kyocera's new personal monochrome laser, the FS-600, prints good-looking text and offers admirable features, including an optional serial port (in case another device such as a scanner is taking up your parallel port). But at \$449 it costs \$50 more than the most expensive lasers on our chart. We also tested two inexpensive but uninspiring new color ink jets from NEC—the SuperScript 750C and 150C. Finally, we put Lexmark's troubled 7200 Color Jetprinter through our tests again, but the second time was no charm.

Still, we did see chart changes thanks to the trend toward lower printer prices. NEC cut the price of its SuperScript 660plus by \$50 to \$199, elevating it to third place on the monochrome chart. And Canon lopped \$50 off the BJC-7000's price; at \$399, this ink jet rises to number two on the color chart, below our venerable Best Buy, the BJC-4300.

KYOCERA KEEPS TRYING

KYOCERA'S FS-600 has the makings of a Top 10 printer. At 5.2 pages per minute on text, it keeps up with most other monochrome laser printers. Its 1.5-ppm graphics speed is relatively slow, but it nearly matches the performance of the fifth-ranked Lexmark Optra E+.

The Kyocera's print quality is mixed. We liked the way it prints text: a strong, solid black, with attractive, delicate letters. But

fine graphics tend to fill in and look fuzzy, making the FS-600 a poorer choice for heavy-duty graphics use.

At \$449, it costs half again as much as our monochrome Best Buy. But if lifetime cost of ownership is more important to you, the FS-600 is worth considering: It comes with a \$200 long-life imaging drum designed to live through dozens of toner refills, making it more affordable than its price tag suggests.

LEXMARK'S COLOR FOIBLES

WHEN WE FIRST tested Lexmark's 7200 Color Jetprinter in February, it behaved like a paper shredder. With the latest driver the paper remains unscathed, but a new problem has appeared: The 7200's color graphics look washed out.

Lexmark says that fixing the older problem accidentally caused the new one. When a driver with *both* fixes is posted to the company's Web site, we'll retest the 7200 again. If its color print quality improves, this ink jet could be a winner, since it prints easy-to-read text and realistic grays. Plus, it comes with great small-business software, including an accounting package and a contact manager. However, its \$399 price is a bit high.

NEC TRIES COLOR

NEC'S SUPERScript 860 and 660plus monochrome lasers have stayed on our personal printer chart for almost a year. Now the company is trying its hand at



WITH ITS GOOD SPEED and print quality on text, the Kyocera FS-600 almost makes the chart, but is too expensive.

color, with much less success. Its two new color ink jets cost little—and are worth about the same.

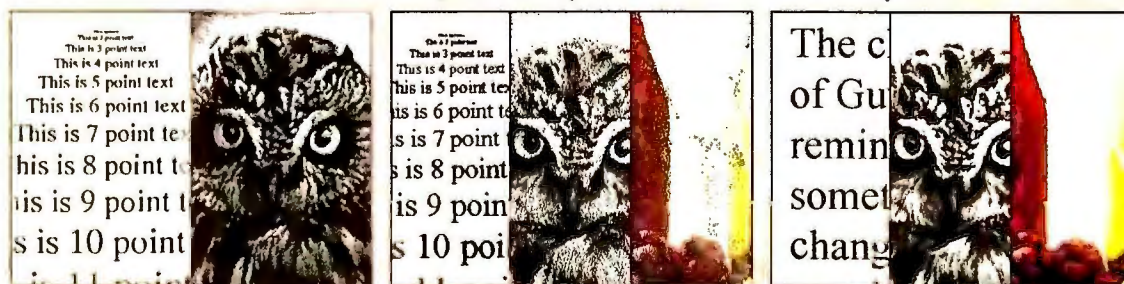
The SuperScript 750C is only \$149—much less than most color ink jet models, which average about \$300. But it's slow and has mediocre print quality. The 750C prints text at just a page a minute—about half as fast as the slowest printer on the chart—while the other models beat its 0.1-ppm graphics speed by at least three times. The 750C's five-color design—there's an extra black tank in the color cartridge—is supposed to provide a greater range of grays, giving them a subtler look; but in our tests, color graphics came out foggy and muted, and text looked blurry. To top it off, the SuperScript 750C's manual is wretched. Its illustrations reminded us of early *Zap Comix*—full of mysterious vibrating arrows and disembodied hands. One chapter is all cartoons, and another is a disorganized mess.

The other new NEC, the SuperScript 150C, is one more sad, single-cartridge printer like the awful HP DeskJet 400L (see February). Even at just \$119, the 150C is not worth its price. With only a three-color cartridge installed, it renders black as a limp blue-green, and colors lack zing. To print real black, you must buy a separate \$26 black-ink cartridge. This SuperScript is also superslow: It takes 2 minutes to print a text page, and 10 minutes to do a single page of graphics. What's good about the 150C? Well, the manual is excellent. But good documentation isn't reason enough to buy this printer.

—Dan Littman ■

PRINT QUALITY SAMPLES

Price and Print Quality Don't Always Match



KYOCERA FS-600

This Kyocera monochrome laser offers dark, precise text, but graphic images look fuzzy. We expect better from a printer that costs a steep \$449.

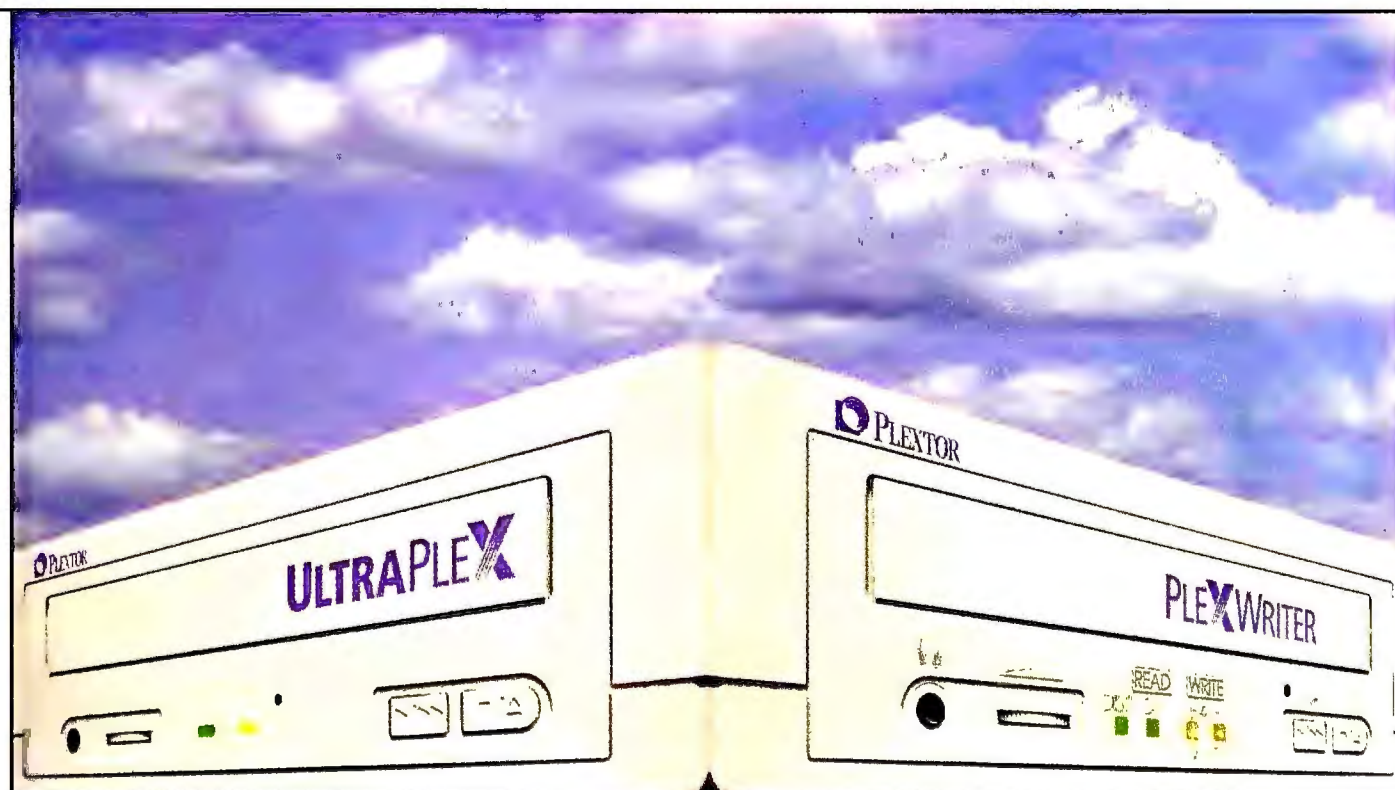
NEC SUPERScript 150C

Shadowy text, spotty gray-scales, and mushy color are the hallmarks of this single-cartridge color ink jet. Even its low \$119 price tag can't recommend it.

CANON BJC-4300

Our color Best Buy, Canon's \$199 BJC-4300, offers handsome photos and grays on ink jet paper (above). It also prints fine on plain paper, though text is a little fuzzy.

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Retail kits include a tray/caddy adapter for tray comfort and caddy protection. And bundled software supports Sneakernet and hard drive disaster recovery from bootable CD. It all adds up to a top-rated price/performance ratio that makes PlexWriter the CD-R to buy.



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PC
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December 2, 1997
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VELOCITY 128

MULTIMEDIA
ACCELERATOR

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"If you have one of these puppies, count yourself lucky." "...you needn't look any further." Computer Gaming, 11.97/01.98

3D WinBench '98 Performance

VELOCITY 128 648

Diamond Viper V330 530

ATI XPERT@Work 444

Blaster Extreme 3D 286

MySique 99



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- 4MB of 100MHz SGRAM memory
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TOP 10 MONITORS

19-INCH MONITORS		Month tested	Street price (1/15/97)	Overall rating	Quality of text/graphics	Comments	Reader service number
1	 Iiyama VisionMaster 450 800/394-4335 www.iiyama.com	NEW	\$899	84	excellent/ very good	FEATURES: 17.6-inch viewable area, .26mm dot pitch tube, 94-Hz refresh rate, ¹ Plug and Play ready, ² three-year warranty, 12-hour weekday toll-free support. PRO: Near-perfect text, detailed graphics, easy-to-use controls, great price, only 19-inch monitor here with BNC connectors. CON: No numeric values for adjustment gauges.	675
2	Cornerstone Imaging Color 45/101sf 800/562-2552 www.corimage.com	retested this month	\$1044	83	very good/ excellent	FEATURES: 17.6-inch viewable area, .26mm dot pitch tube, 94-Hz refresh rate, ¹ Plug and Play ready, ² three-year warranty, 11.5-hour weekday toll-free support. PRO: \$251 price drop, terrific text, graphics that rival images on much pricier monitors, easily adjustable. CON: Pricy for its size, must press Store to save settings.	676
3	Hewlett-Packard M-900 800/752-0900 www.hp.com	NEW	\$958	82	very good/ very good	FEATURES: 17.7-inch viewable area, .26mm dot pitch tube, 89-Hz refresh rate, ¹ Plug and Play ready, ² TCO'95 compliant, three-year warranty, 11-hour weekday toll-free support. PRO: Fine picture, good price, better EMF compliance than most 19-inch monitors. CON: Must press Store button to save adjustments.	677
4	Hitachi SuperScan Elite 751 800/441-4832 www.nsa-hitachi.com	retested this month	\$969	82	very good/ very good	FEATURES: 17.7-inch viewable area, .26mm dot pitch tube, 85-Hz refresh rate, ¹ Plug and Play ready, ² three-year warranty, 8-hour weekday toll-free support. PRO: \$130 price drop, sharp text, good price, easy to adjust. CON: Must press Store button to save adjustments, short support hours.	678
5	Dell 1200 HS 800/289-3355 www.dell.com	NEW	\$924	78	good/ very good	FEATURES: 17.6-inch viewable screen, .26mm dot pitch tube, 88-Hz refresh rate, ¹ Plug and Play ready, ² one-year warranty, 24-hour toll-free support. PRO: Good-looking graphics, good price, well-designed controls, round-the-clock support. CON: Short warranty (unless purchased with Dell system).	679
21-INCH MONITORS							
1	 Cornerstone Imaging Color 50/101sf 800/562-2552 www.corimage.com	retested this month	\$1535	86	excellent/ excellent	FEATURES: 19.4-inch viewable area, .28mm dot pitch tube, 94-Hz refresh rate, ¹ Plug and Play ready, ² three-year warranty, 11.5-hour weekday toll-free support. PRO: Top image quality scores, with near-perfect text and graphics. CON: Must press Store button to save adjustments, no convergence control.	680
2	Mitsubishi Diamond Pro 1000 800/843-2515 www.mitsubishi-display.com	retested this month	\$1750	84	very good/ very good	FEATURES: 19.5-inch viewable area, .28mm Diamondtron tube, 107-Hz refresh rate, ¹ Plug and Play ready, ² TCO'95 compliant, three-year warranty, 12-hour weekday toll-free support. PRO: Sharp text, vivid graphics, very high refresh rate, easy to adjust, stowable drop-down control panel. CON: Expensive, two faint lines visible.	681
3	Sony MultiScan GDM-500PS 800/476-6972 www.sony.com/pc	NEW	\$1799	81	very good/ excellent	FEATURES: 19.7-inch viewable area, .27mm Trinitron tube, 85-Hz refresh rate, ¹ Plug and Play ready, ² TCO'95 compliant, three-year warranty, 24-hour toll-free support. PRO: Excellent graphics quality and crisp text, intuitive control interface, around-the-clock support. CON: Expensive, two faint lines visible across screen.	682
4	Iiyama VisionMaster Pro 500 800/394-4335 www.iiyama.com	retested this month	\$1449	79	very good/ very good	FEATURES: 19-inch viewable area, .28mm Diamondtron tube, 102-Hz refresh rate, ¹ Plug and Play ready, ² TCO'95 compliant, three-year warranty, 12-hour weekday toll-free support. PRO: \$150 price drop, fine picture, good price for a 21-incher. CON: Fairly small viewable area, no calibrations for adjustment gauges, two faint lines visible.	683
5	Princeton Graphic Systems Caliente C2001 800/747-6249 www.pgr.com	retested this month	\$1499	79	very good/ very good	FEATURES: 19.4-inch viewable area, .28mm Diamondtron tube, 100-Hz refresh rate, ¹ Plug and Play ready, ² TCO'95 compliant, three-year warranty, 24-hour toll-free support (automated for 12 hours after 5 p.m.). PRO: Fine picture, fairly inexpensive, small. CON: Buttons look and feel cheap, two faint lines visible across screen.	684



Best Buy

For reviews of products that didn't make the chart, visit www.pcworld.com/t10monitors.

All products: 906

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.

¹ Highest refresh rate at 1024 by 768 resolution.

² 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 have arrived to make big screens much more affordable. From 10 models, we chose the top 5, led by Best Buy Iiyama VisionMaster 450, which offers a superb picture

for less than \$900. Among 21-inch models, we gleaned the 5 best from 11 that we reviewed. Cornerstone Imaging's \$1535 Color 50/101sf earns our Best Buy with a flawless picture. For complete reviews, see "Big Screen Debuts" in this issue.

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TOP 10 GRAPHICS BOARDS

	GRAPHICS BOARDS	Month tested	Street price (1/14/98)	Overall rating	PC WorldBench graphics score/rating	3D rating	Multimedia rating	Comments	Reader service number
1	 ATI 3D Pro Turbo PC2TV 905/882-2600 www.atitech.com	Oct 97	\$219	97	189/ very good	good	outstanding	FEATURES: 8MB of SGRAM, 20D-MHz RAMDAC, ATI Rage II chip, software for 3D modeling, image editing, and VRML. PRO: Terrific multimedia performance, nice 3D, connects to TV. CON: Expensive, mediocre video playback, no toll-free support.	665
2	 Hercules Thriller 3D 800/532-0600 www.hercules.com	Mar 98	\$129	96	188/ very good	very good	poor	FEATURES: 4MB of SGRAM, 22D-MHz RAMDAC, Rendition Verite V2200 chip, no software. PRO: Great price, above-average 3D and decent 2D performance, toll-free support. CON: Slow AVI video playback, no weekend support.	666
3	ATI Xpert@Work 905/882-2600 www.atitech.com	Dec 97	\$169	95	191/ outstanding	good	good	FEATURES: 4MB of SGRAM (upgradable to 8MB), 230-MHz RAMDAC, ATI Rage Pro chip, bundled photo editing and 3D modeling software. PRO: Fast all around, great utilities, connects to a TV, good price. CON: So-so 3D, no toll-free support.	667
4	STB Nitro 3D 800/234-4334 www.stb.com	Dec 97	\$99	95	190/ outstanding	adequate	adequate	FEATURES: 4MB of EDD DRAM, 170-MHz RAMDAC, S3 Virge/VX chip, bundled 3D games. PRO: Least expensive board on chart, speedy 2D, toll-free support, lifetime warranty. CON: 3D images are below average in quality.	668
5	ATI 3D Xpression+ PC2TV 905/882-2600 www.atitech.com	Oct 97	\$115	94	190/ outstanding	adequate	adequate	FEATURES: 4MB of SGRAM, 170-MHz RAMDAC, ATI Rage II chip, bundled 3D games plus 3D modeling, image editing, and VRML software. PRO: Good 2D, speedy 3D, nice bargain, connects to a TV. CON: Mediocre video playback, no toll-free support.	669
6	STB Velocity 128 800/234-4334 www.stb.com	Nov 97	\$179	94	189/ very good	very good	adequate	FEATURES: 4MB of SGRAM, 230-MHz RAMDAC, NVidia Riva 128 chip, bundled games and 3D image editing software. PRO: Excellent 3D quality, strong 2D performance, good game software. CON: Poor AVI video playback.	670
7	Diamond Stealth 3D 2000 Pro 800/468-5846 www.diamondmm.com	Jan 98	\$135	93	191/ outstanding	good	very good	FEATURES: 4MB of EDD DRAM, 17D-MHz RAMDAC, S3 Virge/DX chip, bundled 3D game, photo editing software, and multimedia encyclopedia. PRO: Great 2D, fast 3D, inexpensive, connects to a TV. CON: No toll-free support.	671
8	Hercules Terminator 3D/DX 800/532-0600 www.hercules.com	Oct 97	\$109	93	189/ very good	adequate	very good	FEATURES: 4MB of EDD DRAM, 17D-MHz RAMDAC, S3 Virge/DX chip, bundled 3D games. PRO: Inexpensive, quick in multimedia programs, excellent AVI video playback, toll-free support. CON: Subpar 3D quality overall, driver bug in Terracide game.	672
9	Hercules Stingray 128/3D 800/532-0600 www.hercules.com	Oct 97	\$209	91	184/ very good	very good	poor	FEATURES: 4MB of EDO DRAM, 180-MHz RAMDAC, Alliance ProMotion-AT3D chip, 3Dfx Voodoo Rush 3D chip set, bundled games. PRO: Terrific 3D quality, toll-free tech support. CON: Pricey, slowest 2D performance on chart.	673
10	Hercules Dynamite 3D/GL 800/532-0600 www.hercules.com	Feb 98	\$249	91	191/ outstanding	very good	good	FEATURES: 8MB of SGRAM, 23D-MHz RAMDAC, 3DLabs Permedia 2 chip, bundled games and image editing software. PRO: Excellent 3D and good 2D performance, toll-free support. CON: Priciest on chart, disorganized utilities, AVI images look blocky.	674



Best Buy

For reviews of products that didn't make the chart, visit www.pcworld.com/t10graphics.

All products: 905

HOW WE TEST We tested PCI boards under Windows 95 with PC WorldBench 1.0 at 800 by 600 resolution and 16.8 million colors, at 1024 by 768 and 65,536 colors (reported here), and at 1280 by 1024 and 65,536 colors. The 3D score is based on frame rates in our VRML and 3D game tests and on subjective ratings in three games. The multimedia rating is based on frame rates in our Macromedia Director and AVI playback tests, and on timed scores in our PowerPoint multimedia presentation tests. Boards were tested in a Dell Dimension XPS P133c with 32MB of EDO DRAM and 256KB of pipeline-burst secondary cache. The overall rating is based on performance (40 percent), features (30 percent), price (20 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.



THIS MONTH we tested four new boards: the Elsa Victory Erazor, the NewCom Dash, the Number Nine Revolution 3D SGRAM, and the Yuan 3DXtreme. None made the chart, but the Number

Nine card came closest. Except for the type of RAM it uses, it's a carbon copy of the company's Revolution 3D board we tested last November. But at \$179, the new model costs over \$100 less than the older board and offers similar 2D performance. ■

THIS COLLAR GOES TO FILEMAKER PRO.

The Town of Poughkeepsie Police Department uses FileMaker Pro to organize their entire operation. So they can nab more bad guys.

The Town of Poughkeepsie Police Department once used two notepads and a ballpoint pen to track cases. Though this is a common system, it leaves a lot of holes. So with no formal software training at all, Detective David Lundgren mastered a new and better way. He rounded up some drug-seizure money, picked up a copy of FileMaker® Pro software, and quietly revolutionized his department's operations.

MILLIONS OF FANATIC USERS

But if you think the Town of Poughkeepsie PD is an isolated case, your evidence must have been tampered with. Truth is, millions of zealous users in organizations of all shapes and sizes manage their data with FileMaker Pro. It brings new information to light, you can customize it to the way you work, and it's easy to use. Importing spreadsheet data is as simple as dragging and dropping.

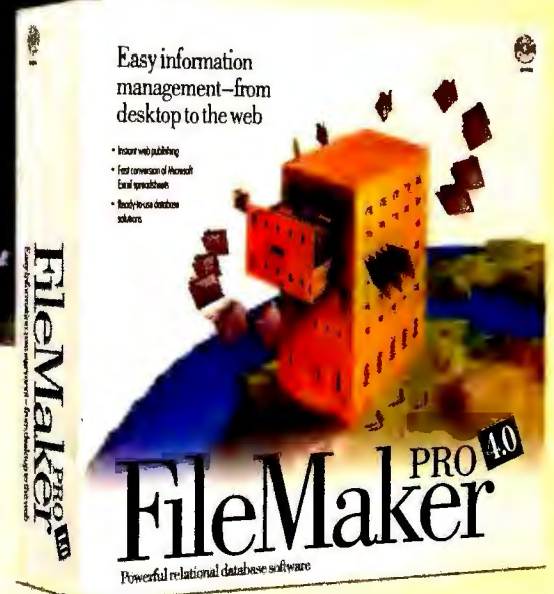
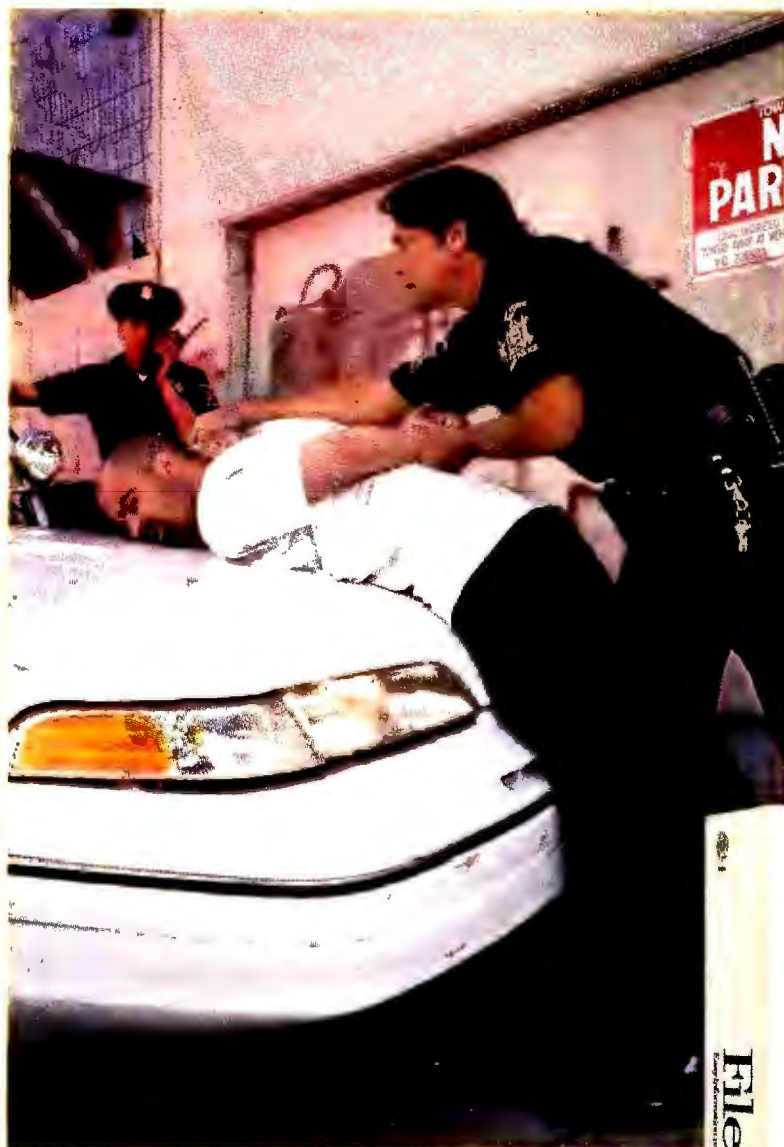
MANAGING INFORMATION IS A SNAP

Just ask Detective Lundgren: "Yesterday we brought in a suspect for a string of residential burglaries. The detective did a quick find on his laptop: 'Burglaries in Zone 2 since August.' The suspect confessed to five of them. And there's no way he would have if we hadn't had FileMaker Pro."

USE INFORMATION IN WAYS YOU NEVER THOUGHT POSSIBLE

FileMaker Pro can show you information you didn't even know you had. And its extensive sorting and reporting capabilities let you view that data however you like, creating everything from simple mailing labels to a complex inventory system. Spreadsheets just can't do that. What's more, anyone can use it. "I have guys working for me who can erase a hard drive just by looking at it," said Lundgren, "but every one of them gets the job done with FileMaker Pro."

To get the full story on how FileMaker Pro has simplified life for the Town of Poughkeepsie PD and other organizations, visit us at www.filemaker.com/pcw. Or visit your local reseller so you can start using FileMaker Pro right now.







COMPUSA
THE COMPUTER SUPERSTORE®

COMPUTER **CITY**
SUPERSTORE

ELECTRONICS
Fry's

MICRO CENTER
THE COMPUTER DEPARTMENT STORE®

TOP 10 MODEMS

33.6-KBPS EXTERNAL MODEMS		Month tested	Street price (1/23/98)	Overall rating	Average transfer time per MB (min:sec)	Comments	Reader service number
1	 3Com Courier V. Everything With V.34 External 800/877-2677 www.3com.com	Jan 97	\$225	80	2:42	FEATURES: Flash ROM, distinctive ring, 230.4-kbps PC-to-modem speed, manual volume control, password protection, callback security, QuickLink II software. PRO: Rich in features, great documentation, \$60 software upgrade to 56 kbps. CON: Most expensive 33.6-kbps modem on chart, takes up a lot of desk space.	691
2	Zoom FaxModem V.34X Plus 800/631-3116 www.zoomtel.com	Aug 97	\$99	79	2:52	FEATURES: MNP-10EC error control, distinctive ring, 115.2-kbps PC-to-modem speed, serial cable, DOS/WinFax Lite software. PRO: Low price, easy-to-follow documentation, seven-year warranty. CON: Lackluster performer, no security features such as password protection or Caller ID.	692
3	Practical Peripherals 336 MiniTower Internet Kit 800/225-4774 www.practical.com	May 97	\$119	78	2:40	FEATURES: 115.2-kbps PC-to-modem speed, QuickLink II software. PRO: Fast performer, very good support policies including lifetime warranty and weekend tech support. CON: Bare-bones, no security features such as password protection or Caller ID, tech support calls are on your dime.	693
4	Microcom OfficePorte Voice 33.6 800/822-8224 www.microcom.com	May 97	\$120	78	2:44	FEATURES: MNP-10EC error control, distinctive ring, 115.2-kbps PC-to-modem speed, voice mail, ASVD, built-in microphone, serial cable, Focal Point fax/data software. PRO: Nice extras including a serial cable, cross-ship modem replacement. CON: Heavy-handed documentation, no security features such as Caller ID.	694
5	Archtek SmartLink 3334AV 888/912-9800 www.archtek.com	Aug 97	\$89	77	2:40	FEATURES: 115.2-kbps PC-to-modem speed, voice mail, speakerphone, VoiceView, QuickLink Message Center fax/data software. PRO: Cheapest modem on chart, speedy, toll-free support. CON: Inadequate documentation, lacks security features such as password protection.	695
56-KBPS EXTERNAL MODEMS							
1	 Global Village Communication TelePort 56 Fax/Modem 800/736-4821 www.globalvillage.com	Dec 97	\$99	81	2:59/2:56 ¹	FEATURES: x2 protocol, 115.2-kbps PC-to-modem speed, serial cable, Global Transfer Light and FaxWorks software. PRO: \$20 price drop on already low price, breezy installation, superb documentation. CON: Sluggish 33.6-kbps performance, short support hours, free upgrade to upcoming 56-kbps standard limited to software.	696
2	3Com U.S. Robotics 56K Voice Fax-modem External 800/342-5877 www.3com.com	NEW	\$239	80	2:45/2:54 ¹	FEATURES: x2 protocol, distinctive ring, 115.2-kbps PC-to-modem speed, voice mail, speakerphone, manual volume control, Caller ID, RapidComm Voice software. PRO: Better value than bare-bones sibling 56K Faxmodem External, free upgrade to 56-kbps standard even if modem swap required. CON: Expensive, no weekend support.	697
3	Zoom FaxModem 56Kx 800/631-3116 www.zoomtel.com	Nov 97	\$139	79	2:31/3:08 ¹	FEATURES: K56flex protocol, MNP-10EC error control, distinctive ring, 230.4-kbps PC-to-modem speed, COMit and WinFax Lite software. PRO: Fast on 33.6-kbps tests, long support hours including Saturday, free upgrade to 56-kbps standard even if modem swap required. CON: Few extras, no security features like Caller ID.	698
4	Shark Multimedia Leopard XT-56K External Speakerphone 800/800-3321 www.sharkmm.com	Feb 98	\$120	78	2:34/3:08 ¹	FEATURES: K56flex protocol, distinctive ring, 115.2-kbps PC-to-modem speed, voice mail, speakerphone, VoiceView, ASVD, manual volume control, serial cable, Caller ID, DialTone software. PRO: Feature-packed, affordable. CON: Short warranty, no cross-ship replacement, free upgrade to 56-kbps standard limited to software.	699
5	Boca Research M56E 56K External SVD Modem 561/241-8088 www.bocaresearch.com	Feb 98	\$139	78	2:39/3:16 ¹	FEATURES: K56flex protocol, 230.4-kbps PC-to-modem speed, distinctive ring, voice mail, speakerphone, V.80 support, Caller ID, QuickLink Message Center software. PRO: Rich features, free upgrade to 56-kbps standard even if modem swap required, \$20 price cut helps put it on chart. CON: Sluggish 56-kbps download rate.	700
 Best Buy  For reviews of products that didn't make the chart, visit www.pcworld.com/t10modems .		All products: 907					

HOW WE TEST We test 33.6-kbps modem-to-modem performance using a pair of identical modems on a Telecomm Analysis Systems simulated phone network. It sends a text file over 55 line conditions, and a mix of five files—graphics, text, program, and compressed files—over one line condition. For our 56-kbps tests, we call a local Internet service provider access number and transfer .jpg, .doc, and .zip files continuously over an 18-hour period. The times to transfer 1MB of data are higher in the ISP test than in the TAS test because the files used in the former are less compressible. Results for the two tests are not comparable. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

¹ V.34 TAS transfers/56-kbps ISP downloads.



IF YOU'RE LOOKING for a fast, voice-equipped 56-kilobits-per-second modem, check out 3Com's new \$239 U.S. Robotics 56K Voice Faxmodem. For a cheaper alternative, consider Boca's \$139

M56E. That model and other 56-kbps units—including the Shark, Zoom, and this month's Best Buy from Global Village—move up a notch because Motorola's analog Surfr series is temporarily discontinued due to a pending sale of that product line.

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awarded Sampo 4 **STARS!**

PC WORLD
ranked us in their **Top 10!**

CADALYST
gave us 4.5 **STARS!**

COMPUTER RESELLER NEWS
presented us with the prestigious
"Recommended" award

COMPUTER BUYERS GUIDE
said "Bottom Line is, the SAMPO
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MODEL	CRT/ VIEWABLE	MAX RES	CONTROLS	DOT PITCH
Value Series				
KM-411	14"/13.0"	1024 x 768	Digital	.28mm
KM-511L	15"/14.0"	1024 x 768	Digital	.28mm
KM-711L	17"/15.8"	1280 x 1024	OSD	.28mm
Performance Series				
KM-520SLP	15"/14.0"	1280 x 1024	OSD	.28mm
KM-711S	17"/15.8"	1600 x 1280	OSD	.26mm
KM-761	17"/16.1"	1600 x 1280	OSD	.25mm
KM-810	19"/18.0"	1600 x 1280	OSD	.22mm (Horz)
KM-835	20"/19.0"	1600 x 1280	OSD	.28mm
KM-950	21"/20.0"	1600 x 1280	OSD	.22mm (Horz)

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Circle 209 on reader service card

The Cutting-Edge Couch Surfer



OKAY, DESK JOCKEYS—get out the popcorn, crack open a cold one, and hit the couch. Tonight you get to do more than flip channels while your brain goes on holiday. You're going to surf the Net, play a few games, build yourself a new Web page, and send some e-mail. Sound like work?

Nope. It's play—and here's how you can tell: You're in your living room parked in front of the TV.

Suddenly the wacky world of home electronics is rich with choices for transforming that idiot box into an entertainment, research, and communications center for the entire family.

Why, you might ask, would you want to turn a perfectly good TV—source of endless hours of passive, vacant entertainment—into a computer, source of endless hours of work and frustration? I wondered the same thing. After all, this is my *living room* we're talking about. So the answer had better be "to provide cutting-edge entertainment to a group of comfortably seated people, preferably holding cocktails." I also wouldn't mind not hav-

ing to fight the rest of the family for computer time to surf the Internet.

So with fun in mind, I looked at three approaches to getting as much computing power out of television as possible—from set-top boxes that turn your TV into a Web-surfing machine, to high-end computers that attach to your television, to devices that connect your PC and TV. I found that you don't need to spend thousands of dollars to get the Net on your set.

THE JAGUAR OF COMPUTERS

THE Philips DVX8000 Multimedia Home Theater is the Jaguar driver's answer to computing. This slick, sexy, powerful machine will definitely make people envy you. But it isn't exactly a financially sound choice, and it will need constant tinkering.

The DVX8000 looks like a fancy stereo, but it's actually a 233-MHz PC with a Pentium MMX processor, a hard disk, a floppy drive, a 33.6-kilobits-per-second modem, two Universal Serial Bus ports, and standard PC connectors. It's also got a TV tuner, high-end video, an FM tuner, a Marantz-designed preamplifier, Surround Sound, and a player for DVD movies, DVD-ROMs, CD-ROMs, and audio CDs. And there's more: a wireless keyboard, plus a remote control that looks like something Mr. Spock would carry. Without the TV, speakers, or (necessary) amplifier, the DVX8000 lists for \$5000. Ouch! To make matters worse, it's worth buying only if you also have a very high-resolution TV or (preferably) a giant monitor. Set-top boxes that perform many of the same functions but cost only about \$1000 should be available later this year.

As with any Jaguar car, though, the DVX8000's fun factor is very high. The *Myst* sequel *Riven* was stunning on my 25-inch TV and captured the gaze of everyone present. Playing *You Don't Know Jack* while reclining on the couch was a blast—the best use of the TV set I've seen. ►

Angela Freeman, Anne Kandra, and
Scott Spanbauer

My son loved playing his kid games, and when we watched a DVD movie in Surround Sound, the earth moved.

But computing or Net-surfing on my fairly-new-but-not-high-res TV was a bust. I nearly went blind trying to read e-mail, and the World Wide Web was a hopeless



BUILT FOR SPEED: The Philips DVX8000 Home Theater, shown with a \$1000 Rotel amplifier.

blur. Forget using Word, Quicken, or a greeting card maker—I couldn't see them at all. After a few hours of squinting, I had to take some ibuprofen and lie down.

When my headache was gone, I selflessly returned to my research. I wanted to see how a DVD game would play from the couch. Since they're still a tad scarce, the only one I have is Silent Steel. But before I even got to play, my TV crashed.



NERVOUS ABOUT getting ripped off on the Internet? If so, steer clear of buying or selling through

Usenet newsgroups—they're the source of a steep 30 percent of the Net fraud cases identified in a new study. Only 10 percent of reported problems involved transactions made via retail Web sites.

SOURCE: WEBGUARDIAN

Not only that, but after I rebooted (my TV!) I couldn't get any sound: My home entertainment system was reduced to a hobbled Pentium PC that would let me watch but not listen to HBO.

I learned one important lesson here: Don't let Windows near any device—TV, toaster, hair dryer, whatever—that you want to be able to just turn on and use. Troubleshooting the television is not my idea of fun.

IF MICKEY MOUSE HAD A PC

ANOTHER DEVICE THAT tries to turn your TV into a computer is the **Wireless PC@TV**. It intercepts the signal that your PC sends to the monitor and transmits it through radio waves to your television set. I installed the transmitter on my PC and hooked up the receiver to my TV upstairs. The process turned my office into a rat's nest of wires, but it worked. I turned on the TV, and there was my computer desktop. Using the infrared keyboard with built-in mouse, I could run applications, send and receive e-mail through my Internet service provider, and play games—all from the comfort of my couch. Amazing!

But that's where the magic ended. I had to tinker for hours to get the remote mouse to work, and I had to run downstairs to the office to pop in a CD-ROM game. None of it was worth the effort. The keyboard is very nice, but everything looked terrible on the TV. I couldn't read the screens, and navigating through e-mail and Web pages was a nightmare. Worst of all, waiting for the signal to travel between my TV and PC made my brand-new Pentium II-233 run like it was a 486—an *old* 486. Even if the product costs only \$400, it's at best a Mickey Mouse solution.

SOMETIMES SIMPLE IS THE BEST IDEA

NEXT I WENT for simplicity—WebTV. It just does one thing: connects your TV to the Internet. It won't run CD-ROMs, so forget about playing Riven or You Don't Know Jack in the living room. And WebTV doesn't currently run Windows,

Scorecard

Philips DVX8000 Multimedia Home Theater

Grade: **B-**; Price: \$5000 list; Philips Electronics; 888/486-6272; www.mmhometheater.com

READER SERVICE NO. 726

Wireless PC@TV

Grade: **D**; Price: \$400 street; RF-Link Technology Inc.; 310/787-2328; www.rflinktech.com

READER SERVICE NO. 727

WebTV Plus

Grade: **A**; Price: varies, but starts at \$199 street, wireless keyboard \$70, subscription to WebTV Plus network \$19.95; WebTV Networks; 800/469-3288; www.webtv.net

READER SERVICE NO. 728

Inergy

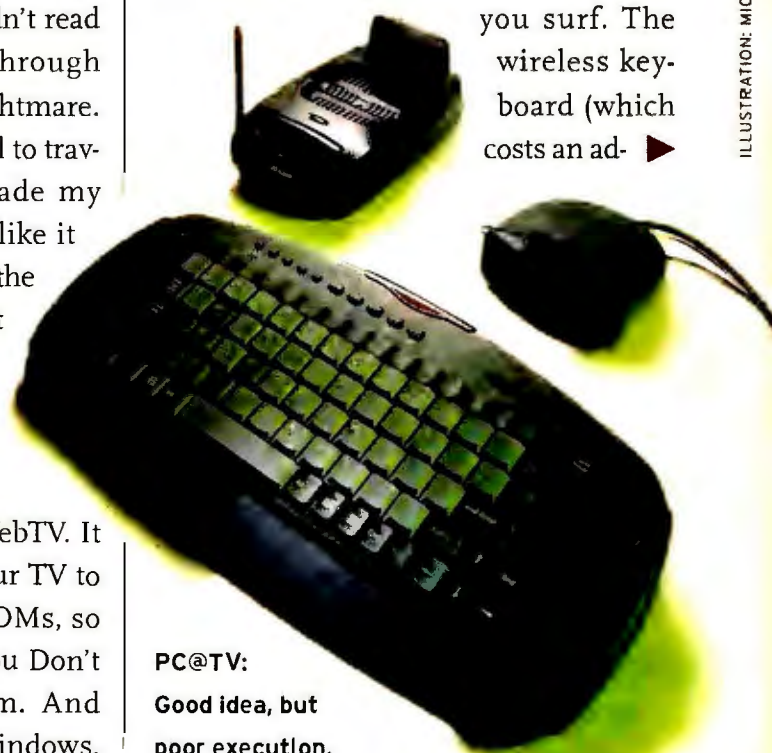
Grade: **B+**; Price: \$5 per month for each tool; Inergy; 617/354-1880; www.inergy.com

READER SERVICE NO. 729

so you can't even play any downloadable games. (Future versions will support Windows CE, or so Microsoft says.)

But even without games (sigh), I found WebTV to be the best of the three approaches. I looked at the **WebTV Plus**, developed by Microsoft and available in stores from Mitsubishi, Philips Magnavox, and Sony (prices start around \$200). I also checked out the older version, the \$99 **WebTV Internet Terminal**. I preferred WebTV Plus even though it costs more. A nice picture-in-picture feature lets you watch TV in a window while

you surf. The wireless keyboard (which costs an ad- ▶



PC@TV:

Good idea, but poor execution.

WOULD THE WORLD'S LARGEST CHIP MAKER SETTLE FOR SECOND RATE 3D GRAPHICS?



GET
REAL

There's a certain company in Silicon Valley famous for advancing the capabilities of the PC platform with the industry's best microprocessors. In fact, it's far and away the world leader. They stake their business and reputation on the quality of the technology they put "inside" (*so to speak*) the PC. Naturally, when this company decided to develop a graphics chip, it's no surprise they partnered with Real 3D to help take graphics performance on the PC to a new level. Will you see a dramatic change in the graphics quality and capability of your computer? You bet. And faster than you might imagine.



ditional \$70) is delightful. And if you subscribe to the WebTV Plus network for \$19.95 a month, you can scroll through TV listings and jump directly from some shows to relevant Internet sites. WebTV Plus also comes with a 1GB hard disk. Best of all, the Internet and e-mail both look good on the TV screen—no squinting necessary. And surfing the Web is fun

adequate—the word processor has a thesaurus and a spelling checker, the contact manager is pretty good, and the Web page designer is very basic. None are likely to compete with Microsoft Office, but they run fairly quickly over the Internet. Just try that with Word.

You can pick up messages from any computer or Internet device that's handy.

I even uploaded some files from my PC to the Inergy site, then used my TV screen to build my own Web page.

WHAT DO YOU WANT?

SO THIS IS the choice you'll have to make: Are you willing to spend a lot of money to get complete computing power (including games)? Or would you rather spend less cash and get the Internet and a little computing power? If fun is the deciding factor, I'll stick with WebTV.

Don't get me wrong—I'd like to play CD-ROM and DVD games in the living room. (In fact, I'm hankering for a game of Jack right now.) But I could buy a lot of cool toys with \$5000-plus—the

CompuServe's New Clothes

IF YOU CAN'T beat the Web, join it. That seems to be the idea behind CompuServe's (www.compuserve.com) new Web-based



interface. It melds CompuServe's message forums and file libraries with original Web content and links, along with access to CompuServe's e-mail accounts through Internet

e-mail packages. Though much of this resembles material that's already available on the Web for free, the forums are still home to some of the best online discussion anywhere—much meatier than the chatter on America Online (which has acquired CompuServe but plans to continue it as a stand-alone service). CompuServe members can use the Web-based interface for no extra charge, or can stick with the existing proprietary software, which will remain available.

Reading, Writing, and...Gateway

SURE, A NEW home PC would be great for your kids' education, but what if they spend more time blasting aliens than learning? A possible solution: Gateway 2000's new Perfect Scholar PC. Starting at \$1599 for a 233-MHz Pentium MMX machine, the system comes with a whopping 47 CD-ROMs of educational software for grades 4 through 12. The software, from Learning 2000, offers full-blown multimedia courses covering English, math, and other subjects, complete with tests and progress reports.

Rating the Shopping Sites

OVERWHELMED BY THE plethora of specialized shopping sites on the Web? For guidance, take a look at ShoppingLab (www.shoppinglab.com). Each week, this new site reviews three online merchants in a given category, from gourmet food to modems. Reviews focus on selection, site security, price, and other criteria, and are based on actual purchases.

-Harry McCracken



WEB-BASED SOFTWARE: Inergy lets you use your WebTV for computing with e-mail, word processing, and more.

with a crowd, a drink, and comfortable seating (though it does escalate remote control wars).

What makes WebTV more than just a fun toy is a new Web site that lets you do some remedial computing in the living room: Inergy (www.inergy.com) provides Internet-resident e-mail, a contact manager, a word processor, a Web page designer, and some other basic computing tools. It's a subscription site: Each application costs \$5 per month, and comes with 10MB of storage space on the site (you can buy more). Subscribers just log on to use the tools; no other software is needed. The tools are



SOFA SURFING: E-mail, Web sites, and better TV viewing are just a few of the benefits you'll get with the WebTV Plus.

money it would take to make the DVX8000 sing—and so far those \$1000 set-top boxes are nowhere to be found.

Frankly, I may be an intrepid computer journalist, but I'm not ready to let Windows loose in my living room.

Christina Wood is a contributing editor for PC World.



ON AVERAGE, folks who buy home office PCs pay between \$1500 and \$2200 for their systems, according to a new report. And in some cases, that investment really pays off: 25 percent of all U.S. small companies began as home-based businesses.

SOURCE: INTERNATIONAL DATA CORPORATION

[IF YOU'VE GOT IT, FLAUNT IT.]

US vs. THEM

SCANNER FEATURES	EASYPHOTO SMARTPAGE PRO	VISIONEER PAPERPORT STROBE
Cutting-edge 30-bit technology for billions of colors and more detail than traditional 24-bit products	yup	nope
Detachable head to scan books and magazines or simply clean the system	yup	nope
ClearScan™ II technology that automatically brightens, sharpens and color corrects to prevent washed-out scans	yup	nope
A straight paper path – unlike scanners that bend, shred or mutilate your irreplaceable photos	yup	nope
Free Technical Support rather than an annoying and costly \$14.95 charge (when you really need help)	yup	nope
An incredible value with more features for less – it's more than just an expensive toy	yup	nope

people want the and color this deliver the tha their prin you for and will s there to h at T

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Two Tools That Deliver Peace of Mind

CALL ME A NERD (you probably do already), but I get a kick out of trying new utility programs. If I find just one that takes care of a computing problem—and does so flawlessly—I'm a happy camper.

I have dozens of utilities on my system, but two in particular stand out, thanks to their impeccable abilities to protect both my data and my privacy. You're going to love what they do.

BACK UP A SECOND

REGULAR READERS OF this column know that I've had my unfair share of computing catastrophes. So I'm always looking for better ways to prevent and recover from disaster. Besides backing up to tape frequently, I also use Second Copy 97, an ultracool program that must have been designed with me in mind.

The idea behind Second Copy 97 is paranoia, pure and simple. It makes untended extra copies (*second copy*, get it?) of all my mission-critical files. On days that I'm writing this column, for instance, I don't have to worry—the program copies all the .doc files from my Home Office folder to an Iomega Jaz drive every hour.

Second Copy is easy to use. I create a profile telling the program what to copy, where to send the files, and how often to do it. I've set up dozens of profiles; one copies my Word .dot files, another cranks out a copy of QuickBooks data, and a third archives my e-mail files. Profiles can be modified easily and set for practically any time increment. I can also tell the program to compress files during backups, synchronize files in the source and destination folders, even move copies of old versions into yet another archive directory.

I've set up Second Copy to make backups on an Iomega Jaz drive, but you can

I have dozens of utilities, but two stand out, thanks to their abilities to protect my data and my privacy.

also use floppy disks or a small, older hard drive (like that one currently serving as a doorstep). Second Copy is a fully automated 32-bit program, but if you're using Windows 3.x, don't fume—Second Copy 4.0 is there for you. Download a trial copy from PC World Online.

GOT MILK?

IF YOU LIKE TO SURF the Web, you probably already know that sites collect data about you whenever you visit them. The Internet is big business, and companies are curious about your interests, which they discover based on what links you click, when you log on, and whether you've visited their site before (uh-oh, it's that Bass again...).

Web sites gather and store this demographic trove in "cookie" files that live on your hard disk. You can set your browser to accept or reject individual cookies, or swear off them completely, but it's a hassle either way.

I get tired of confirming the dozens of cookies some Web sites send my way (PC World Online is no exception). Disabling cookies is no good either, because

there are lots of them I actually want and that are critical

to my browser's well-being.

Details about my personal Yahoo page are kept in a cookie, for example; so are my *New York Times* password and the books in my Amazon.com shopping cart. Still,

I'm territorial: Unless I give permission, keep your cookies off my hard disk.

To block cookies selectively, I use Cookie Pal, a magnificent \$15 shareware program available at PC World Online. Cookie Pal sits unobtrusively in my Windows 95 system tray, coming alive when a Web site requests a cookie. But instead of simply rejecting cookies willy-nilly, it gives me choices: accept or reject it this time only, always dump a specific cookie, or always accept it.

I've set Cookie Pal to start automatically when I load Netscape (it also works with Internet Explorer and with America Online's and CompuServe's browsers) and to alert me with a .wav sound when a cookie's requested. (For more cookie tips and info, check out www.cookiecentral.com.)

Have a favorite utility? I want to hear about it. Drop me a line at steve_bass@pcworld.com.

Cookie Pal

\$15 list, Kookaburra Software, www.kburra.com

READER SERVICE NO. 641


Second Copy 97, Second Copy 4.0

\$29.95 list, Centered Systems, 800/242-4775 ext. 10552, www.centered.com



Find files from this article at 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.





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 **GATEWAY2000**



GP6-233

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- 4MB 3-D AGP Graphics
- 2GB 11ms Ultra ATA Hard Drive
- 13X min/32X max CD-ROM Drive
- 3.5" Diskette Drive
- GP-Series Mid-Tower Case
- 104+ Keyboard & MS® IntelliMouse™
- Microsoft® Windows® 95
- MS Office 97, Small Business Edition plus Bookshelf® 98
- Gateway Gold™ Service & Support for GP-Series PCs

\$1499 Gateway GoldValue
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PC World Power Desktop, October 1997

He doesn't even Boot Up until 3 a.m.

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GP6-266

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- 8MB 3-D AGP Graphics
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- 8.4GB 8.5ms Ultra ATA Hard Drive
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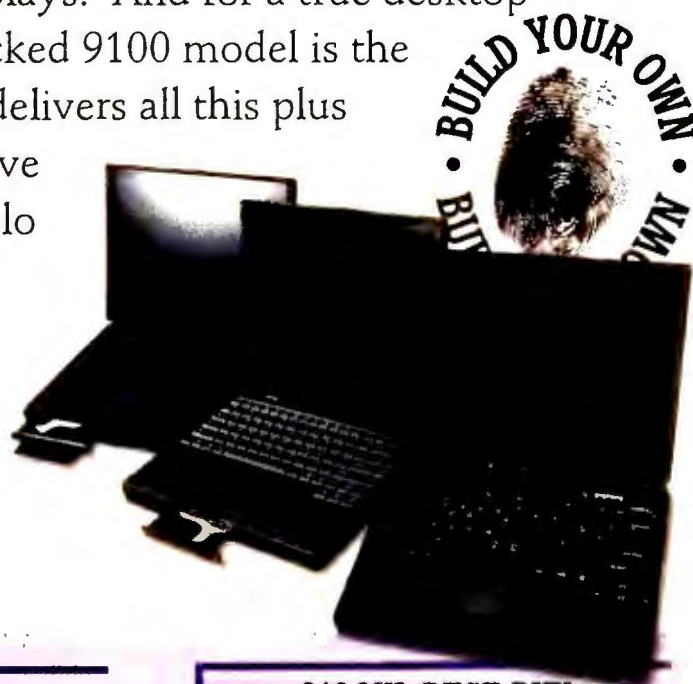
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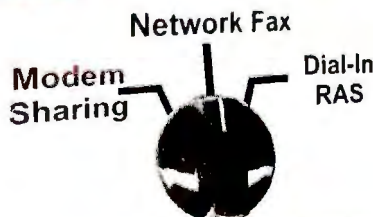
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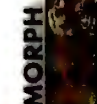
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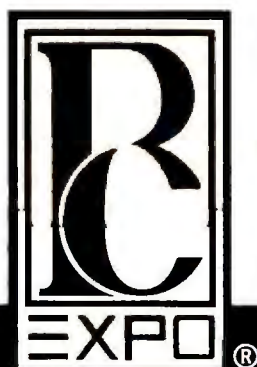
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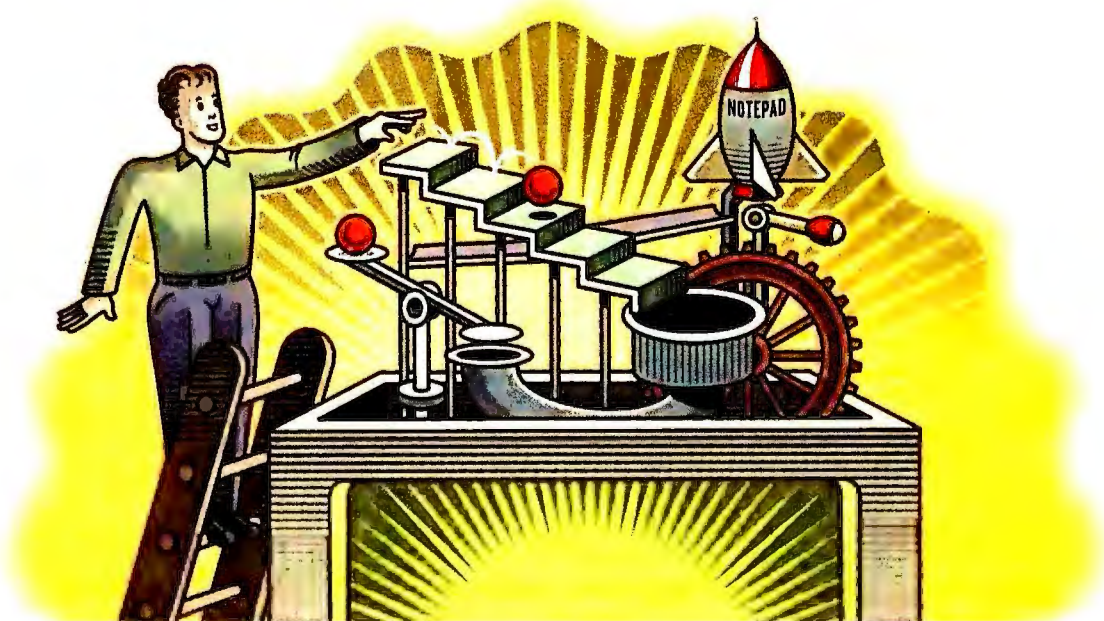
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HERE'S HOW



ANSWERLINE

Automate Win 95 With Old-Fashioned Batch Files



IN WINDOWS 95, BATCH FILES have been supplanted by Shortcuts and the Startup folder. Now, I must load three programs to use my Iomega Zip drive. Iomega's installation program places these files in the Startup folder, which is fine if you use the drive all the time, but I don't. How do I make a "batch" file in Windows 95 that can run all three programs with one click?

Robert De Filippi, Fishkill, New York

EASY—YOU CREATE AN old-fashioned, DOS-style batch file. Not only do such files work in Windows 95, they work better, and they can handle some new tricks.

For instance, you can run a Windows program from within a batch file, something you couldn't do in Win 3.x. And you can control whether the programs run simultaneously or sequentially.

A batch file is the same in Win 95 as it is in Win 3.x and DOS. It's a script in the form of a text file, containing anything you might type at the DOS prompt, and each command must be on its own line.

You can create a batch file in Notepad. When you save it, select the type *All Files (*.*)*, and give your file the extension *.bat*.

To edit a batch file, right-click the file's name in Explorer and select *Edit*. This will bring up the file in Notepad.

By default, batch files expect Windows programs to multitask, so they don't wait for one to close before launching the next. If you want a program to run its course before the next one starts, add the command *start /w* (for "wait"). The batch file in **FIGURE 1** won't process the defrag command until the scan is finished.

To close a batch file's window when the program has finished, end it with the command *cls* (for "close screen"). That command must be the only item on the last line, without even a return after it.

A Shortcut to a batch file is a wasted cluster, which could take up as much as 32KB. Instead, put the batch file on the desktop or in C:\Windows\Start Menu. You'll lose some cosmetic control—you won't be able to change the icon—but you'll know where the real batch file is.

WHEN THE INTERLOPERS ARE GONE

IN JANUARY'S *Answer Line*, I recommended a trick for keeping housemates off your computer: Change the name of the program that launches Windows from *win.com* to *bill.com*. Once you do this, booting the computer lands the user at the DOS prompt with a scary error message. Only you (and other *PC World* readers) know that typing *bill* will launch Windows.

Several readers have told me that the trick worked, and that housemates will no longer go near their computers. Now the readers want to get back the convenience of having Windows load every time they boot. To return things to normal, shut down Windows, selecting *Restart the computer in MS-DOS mode*. At the DOS prompt (which will probably read C:\Windows), type *ren bill.com win.com*.

HOW MUCH MEMORY DOES WINDOWS TAKE?



I'VE HEARD THAT WINDOWS 95 can't properly address more than 64MB of memory. Is this true?

Brian D. Hughes, Honolulu

THIS RUMOR ABOUT Windows' limited memory capabilities has been circulating for awhile. Let's squelch it right here. Win-

By Lincoln Spector

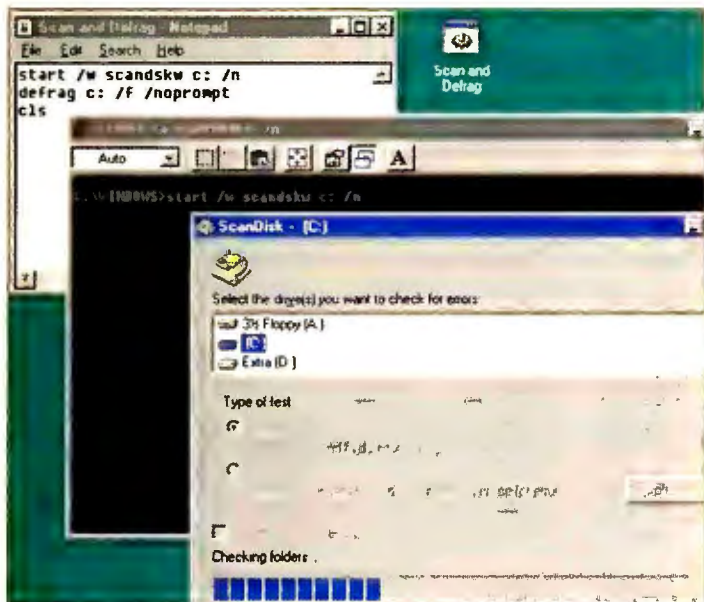


FIGURE 1: BATCH FILES are still handy in Win 95. This batch file tells your system to scan the hard drive, then defrag it.

THE SKINNY ON FAT32

DELL SET UP MY new D266 with FAT16 instead of FAT32. I'd rather have the latter because under FAT16, my 6GB hard drive must be split into three 2GB partitions. I find this an annoying way to work. Can I change the drive to FAT32 without using Windows' fdisk command, which would erase everything on my disk?

Ryan Morris, Toronto

DELL IS ONE OF A handful of vendors that decided to avoid the FAT32 file system when it became available last year. Dell's chief concern was that all but the most

current versions of certain programs wouldn't work with FAT32.

The traditional FAT16 file system can't manage partitions larger than 2GB, and it can handle that size only by storing files in wasteful 32KB clusters. A FAT32 drive can work with partitions up to 2 terabytes, and can use 4KB clusters on partitions as large as 8GB. Until Windows 98 ships, FAT32 will be available only on new systems.

To see if your system can use FAT32, right-click *My Computer* and select *Properties*. Under System on the *General* tab, look for the number 4.00.950 B (see FIGURE 2). To see if your system is using FAT32, double-click *My Computer*, right-click the C: drive, and select *Properties*. If the Type line includes the word 'FAT32', that's what you've got.

How do you switch over to FAT32 if your system supports it? If you're not interested in waiting for Windows 98, which will come with a conversion utility, try PowerQuest's PartitionMagic. Unlike fdisk, this program can make the change without wiping out your data. (I still recommend backing up beforehand just to be safe.) Once you have PartitionMagic installed and running, select *Advanced* • *Advanced FAT Properties*. For Partition Type, select FAT32. Take a deep breath, and click OK.

But note that your system vendor may not approve. Dell support techs, for instance, may insist that you change back to FAT16 before they answer any questions.

ANSWER LINE

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INTERNET



DON'T MISS ADDITIONAL HERE'S HOW information at www.pcworld.com/hereshow.

By the time you read this, Dell should be offering FAT32 on some of its systems. And when Windows 98 ships, FAT32 will probably become the default.

• PartitionMagic 3.0 \$70 street; PowerQuest Corp.; 800/379-2566, 801/226-8941 (fax); www.powerquest.com

READER SERVICE NO. 640

FAT32 ISN'T THAT GOOD

IN FEBRUARY'S COLUMN, we ran a table showing the amount of hard disk space 86 small (5KB to 6KB) files would take up with different partitions. Andy Olk of Brooklyn, New York, noticed that the size I gave for FAT32, 344KB, is actually smaller than the size of the files themselves, 437KB. Since FAT32 doesn't compress the files, this is, of course, impossible.

I goofed. To calculate the space used, I multiplied the number of files by the size of one cluster (4KB in the case of ►

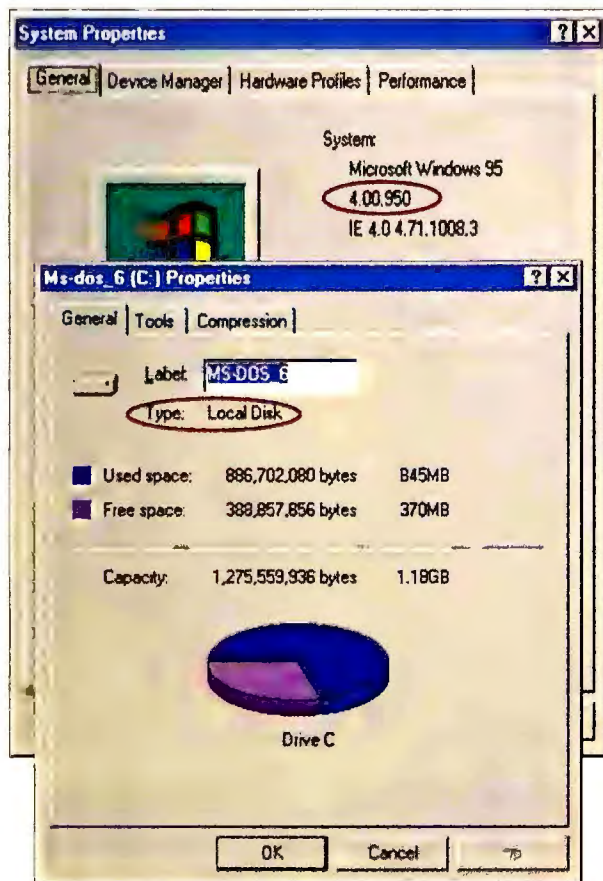


FIGURE 2: FIND OUT IF YOUR SYSTEM supports the FAT32 file system by checking under the General tab in these two Properties dialog boxes.

FAT32). But since the files were between 5KB and 6KB, each of them would actually use *two* clusters on a FAT32 partition. The correct number is 688KB.

PROTECT LIMITED RESOURCES



IT SEEMS LIKE every time I have a problem with Windows and there's no logical explanation, I'm told the culprit is system resources. I can launch the Resource Meter to see the status of my user, system, and Graphics Device Interface resources, but nothing explains what those are and what causes them to drop so low.

Janice Angle, Bethlehem, Pennsylvania
SYSTEM RESOURCES ARE A FLAW in Windows' design, and the best I can say about them is that they were much worse in Windows 3.x.

The resources are composed of two sections in memory called *heaps*, each of which is only 64KB. (Windows 95 has other heaps with no size limit, but a lot still happens in the old, smaller ones.)

The closer either heap gets to being filled, the more unstable Windows becomes.

The two heaps are GDI, which stores images for on-screen display, and User, where programs keep windowing and other information. The Resource Meter simply shows whichever of the two is worse off at the moment (see **FIGURE 3**).

Applications share resources like they share disk space—reluctantly. As you enter, use, exit, and reenter programs, the heaps fill up. You can reduce the problem by practicing bare-bones computing—don't run unnecessary programs or use wallpaper—but the only way to clear a heap is to exit and reenter Windows.

If you didn't install the Resource Meter, insert the Windows 95 CD-ROM. When the blue Win 95 window appears, click *Add/Remove Software*. In the Add/Remove Programs Properties dialog box, click the *Windows Setup* tab. In the Components list select *Accessories*, and then click *Details*. In the Accessories dialog box, check

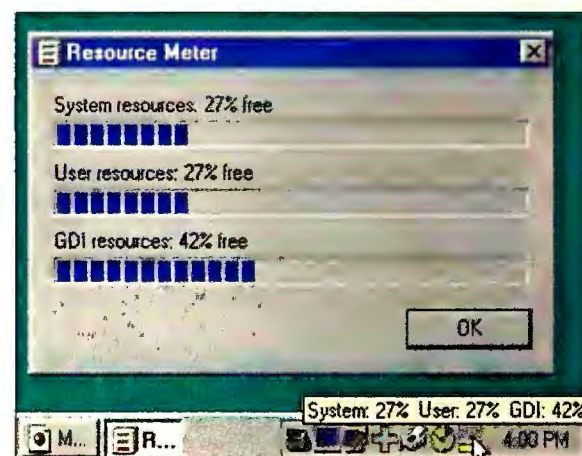


FIGURE 3: MY RESOURCES ARE LOW. At least that's what Windows 95's Resource Meter says.

System Resource Meter. Click OK twice.

To launch the meter, select *Start•Programs•Accessories•System Tools•Resource Meter*. The meter will appear as a tray icon. Double-click the icon for a detailed view.

Answer Line welcomes your questions and pays \$50 for published items. Lincoln Spector is a contributing editor for PC World. See page 14 for contact information. ■

IN THE CHANCERY COURT OF THE STATE OF DELAWARE IN AND FOR NEW CASTLE COUNTY

BRANDON COX, by EDWARD COX,
his natural guardian and next friend,
JOHN KREPS, and MARK
SOLOMON, M.D.,
Individually and On Behalf of All Others
Similarly Situated,

Plaintiffs,

v.

IOMEGA CORPORATION,

Defendant.

Civil Action No.:
15809

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Manage long file names ♦ Create Win 3.x shortcuts ♦ Upgrade to NT 4.0's File Manager

Take Full Control of the Windows 95 Control Panel

95

CONTROL PANEL IS a handy yet oddly inconsistent piece of Windows' interface. It behaves like a free-floating Windows 3.x Program Manager window with Auto Arrange turned on, yet it resists even minor attempts at customization. (Just try changing an icon name, for example.) Still, with a little know-how, you can make Control Panel meet your needs.

Get rid of obsolete icons. You removed an application that you no longer use, but how do you get rid of its icon in Control Panel? Not all programs insert Control Panel icons in the same way, but chances are the icon you want to remove corresponds to a file with the .cpl extension.

First, exit from Control Panel. Then open Windows Explorer and search the Windows\System directory for a suspicious-looking .cpl file. To be safe, move it to a temporary directory or a floppy disk; don't delete the file.

Now restart Control Panel. If the culprit icon is gone, you found the right file. If not, restore the .cpl file and try again.

If you're having trouble deleting the icon for a mouse or other pointer, you may need to remove the device's driver (and edit the system.ini file accordingly) to zap its icon. Consult the device's documentation or contact the manufacturer.

Limit access to certain controls. If you share your PC with family members or colleagues and want to discourage them from messing with your display properties, network configuration, or any other control, you can remove that icon or restrict access to the settings without remov-

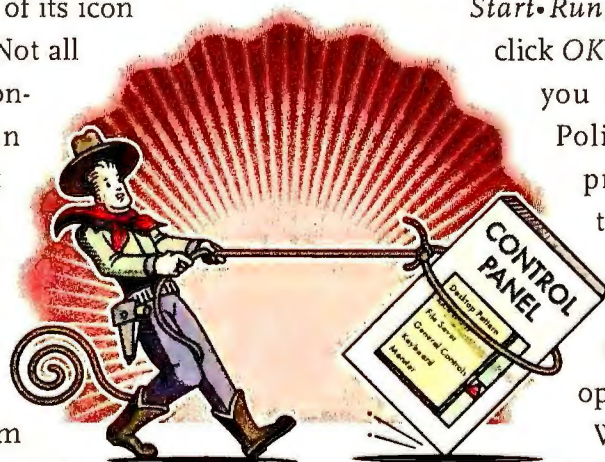
ing its .cpl file.

You can restrict access to controls by using the System Policy Editor. If you haven't installed this utility, you can find it in the admin\apptools\poledit folder of your Windows 95 CD-ROM or on Microsoft's Web site at www.microsoft.com/windows95/info/admintools.htm. Choose

Start•Run, type **poledit**, and click OK. The first time that you start the System Policy Editor, it may prompt you for a template; look for **admin.adm** in the Windows\Inf folder and then open the file.

With the System Policy Editor open, choose **File•Open Registry** and double-click the **Local User** icon. Click the + next to the Control Panel folder icon, and then click the + next to each control that you want to limit. Check the box that begins with **Restrict**. With the control still selected, check off the options in the bottom of the dialog box that correspond to the portion(s) you want to restrict. For example, to keep people from messing with your Windows color scheme and system fonts, click the + next to Display, check the **Restrict Display Control Panel** box, and then check **Hide Appearance page** (as shown in **FIGURE 1**).

When you've set all the restrictions you want, click OK, choose **File•Save**, and exit. You'll no longer be able to see certain Control Panel tabs; in some cases double-clicking one of its icons or options will inform the user that the control is restricted.



Unclutter Norton Desktop

NORTON DESKTOP IS GREAT, but all those icons and toolbars take up precious screen space. To hide each of these elements, choose its name from the Options menu—a check mark means it's visible. But what if you want to get rid of the menu bar, too? Choose **Options•Customize** and click **Desktop Layout**. Under Menu, select **Off** and click OK. Click **Yes** to confirm. Your Windows (Norton) desktop is now clean as a whistle. To see the menu, just right-click on an empty area of the desktop.

Obliterate access to Control Panel. If the measures outlined above don't foil the more sophisticated members of your family or office, you can block access to Control Panel entirely. Open the System Policy Editor and double-click the **Local User** icon. Click the + next to Shell, click the + next to Restrictions, and check **Remove folders from 'Settings' on Start Menu**. Click OK, select **File•Save**, and exit.

Be forewarned, though, that doing this prevents you from adding applications or loading files from your Windows 95 disc, since Win 95's Setup function is located in Control Panel.

Put your controls on the Start menu. Instead of opening Control Panel to get to frequently accessed controls, why not put them in Windows 95's Start menu? Create a new folder called **Control Panel** in ►

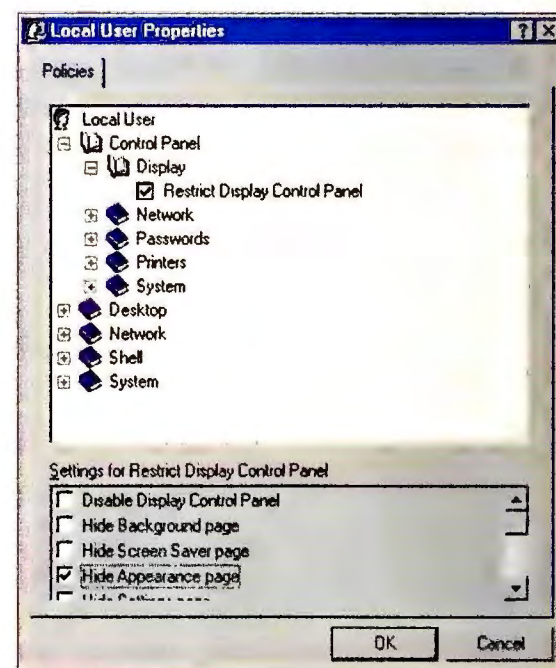


FIGURE 1: BLOCK ACCESS to key areas of Control Panel with Win 95's System Policy Editor.

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no more lost information

no more filing cabinets

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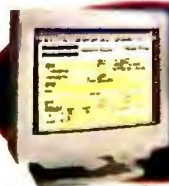
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the Windows\Start Menu directory. Then open the real Control Panel and select all the icons you want to include in your new menu. Use the right mouse button to drag and drop the icons into the new folder. Then choose *Create Shortcut(s) Here*. Continue customizing as desired—for example, renaming Shortcuts or putting additional Shortcuts into the appropriate folders (see **FIGURE 2**).

GET ALONG, LITTLE FILE NAME

95 WHEN YOU FIRST SWITCH to Windows 95 or NT, which both support long file names, you may go hog-wild giving descriptive names to your files. But overindulgence has its price. Here are some quick tips to help you avoid the pitfalls of long file names.

Establish a file-naming convention. You may think that 'Lien Against Your Property.doc' is a perfectly clear file name, but when a client reads it in Windows 3.x, it will look like 'lienag~1.doc'. And if you have several files (such as Lien Against Your Car.doc, Lien Against Your Boat.doc, and Lien Against Your Home.doc), they may all end up looking almost the same in DOS or Windows 3.x (lienag~1.doc, lienag~2.doc, and lienag~3.doc).

To avoid these problems, set up a file-naming system within your company or workgroup. For example, you could use the first two characters for a project name code, the third and fourth for a chapter or section number, and the fifth and sixth for the author's initials. After the first six let-

ters, you can get more descriptive. If your files will be going to someone (such as customers) who couldn't be expected to share your policies, either stick to conventional 8.3-style file names or else make sure that the name's first six characters contain the file's crucial identifying information (such as carlien.doc, homelien.doc, or boatlien.doc).

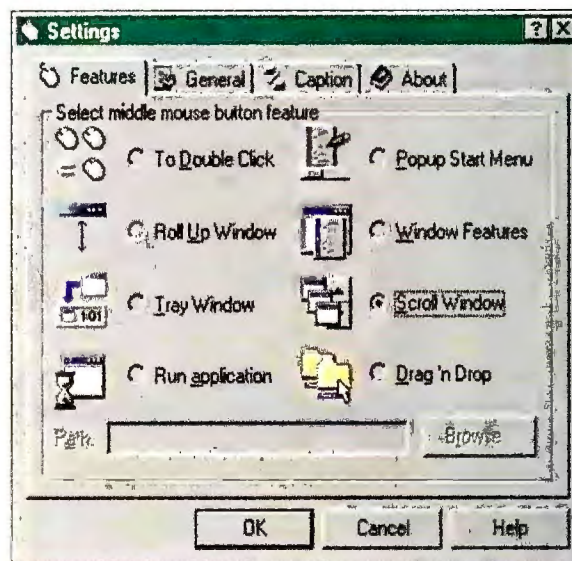
Short isn't always sweet. The Microsoft Windows 95 Resource Kit tells you how to edit the Windows Registry to make shortened file names appear friendlier to Windows 3.x users by snipping off the "tail"—the tilde and number that you see in file names such as progra~1—to permit the traditional 8.3 naming scheme (programf.exe, for example).

Ignore such advice.

Some programs expect to see the file name's tail and will use it internally, especially when interacting with your Program Files folder (or progra~1, in this case). If you make this change to the Windows Registry and use Windows 95 Setup, Microsoft Plus Setup, or the Add/Remove

Teach Old Mice New Tricks

JEALOUS OF FRIENDS who scroll windows with their cool new mouse wheel? Well, if you have a three-button mouse, you don't need a mouse wheel: You just need Cool Mouse 97, a freeware utility that lets you scroll—and perform other chores—by clicking your mouse's middle button.



If you don't mind slapping the <Scroll Lock> key, you can also use the program with a two-button mouse. Get cm97set.exe from PC World Online or at www.surfport.com/solver.

Programs icon in Control Panel, the applications in your Program

Files folder may not work correctly.

Zip it up. If your older e-mail application is truncating your long file names to the 8.3 scheme, investing in a zip utility can be a cheaper solution than getting a new mail system. Products like Nico Mak's WinZip let you compress files with long names. When these files arrive at the destination PC, the recipient can unzip them to see the original names in all their lengthy glory. WinZip 6.3 has a registration fee of \$29 and can be downloaded from PC World Online or www.winzip.com.

Cap it off. Although long file names allow mixed upper- and lowercase characters,

Windows 95 resists letting you create some folder names in all capital letters. To overcome this stubbornness, you must make your folder name longer than eight characters, include at least one lowercase letter, or have a space somewhere in the name but not at the beginning or end.

If you have Microsoft Internet Explorer 4.0, a better solution is at hand. In any IE or folder window, select **View>Folder** ►

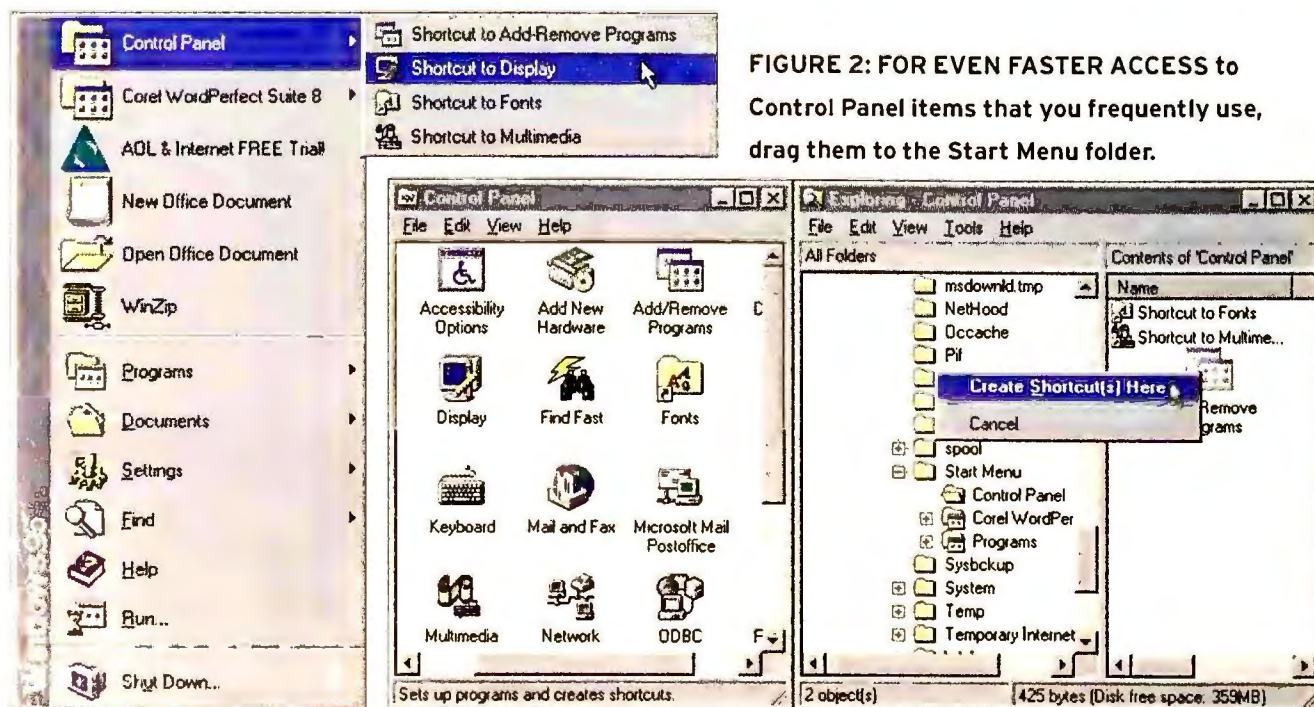


FIGURE 2: FOR EVEN FASTER ACCESS to Control Panel items that you frequently use, drag them to the Start Menu folder.

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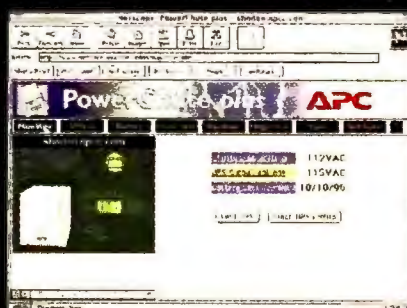
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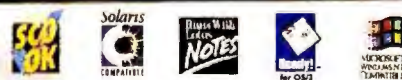
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Options and click the View tab. Check the *Allow all uppercase names* box, and then click OK.

CREATE FOLDER "SHORTCUTS"



IF YOU STILL use Windows 3.x, you may envy users of Windows 95 for their ability to open frequently used directories by double-clicking a Shortcut icon on the desktop. You can approximate these Shortcuts in Windows 3.x by having File Manager save custom directory icons in a "desktop" below the windows you normally use.

Start File Manager and navigate to a folder. Choose *Window•New Window* to open that folder in a window of its own. Now customize the window to look the way you want. For example, to eliminate the tree pane choose *View•Directory Only*. You might also want to choose *View•Name* or *View•Partial Details* to limit how much information is displayed for each file in the folder. If you want to see only a certain file type, choose *View•By File Type*, and in the Name box use wild cards to specify what you want to see—such as *.exe to see only applications, or *.ini to see only initialization files.

When you're finished, minimize your new folder window. For easy access to it, choose *Window•Tile Horizontally* or *Window•Tile Vertically*, and you'll be able to see your minimized folder icon below the main window(s) that you normally use (see **FIGURE 3**). The finishing touch is to save your new arrangement: Hold down

the <Shift> key as you choose *File•Exit*.

Repeat these steps for all the folders that you access frequently. From now on, you can copy files to these folders just by dragging and dropping items onto the appropriate icon, as in Figure 3. And you can instantly access the folder by double-clicking the icon. It's not quite a Windows 95 Shortcut, but it's the next best thing.

BETTER FILE MANAGEMENT FOR WINDOWS NT



IF YOU RECENTLY started using Windows NT 4.0, you may find yourself longing for a better file management utility than Explorer—especially if you're used to File Manager in Windows 3.x or NT 3.x.

You're in luck: NT 4.0 comes with an up-to-date File Manager with all the features you've come to love plus support for long file names. File Manager is superior to Explorer in many ways. Here are some of the things you can do with it.

- Limit the files displayed in a window with wild cards: Choose *View•By File Type*.
- Customize the toolbar: Choose *Options•Customize Toolbar* or double-click an empty area of the toolbar.
- Display available drives on a toolbar instead of in a drop-down list: Choose *Options•Drivebar* to toggle it on and off.
- Control which attributes are displayed in Details view, including the MS-DOS file name: Choose *View•Partial Details*.
- Customize a particular font without affecting the fonts of desktop icons:

Choose *Options•Fonts*.

- Arrange multiple minimized icons and windows with or without a directory tree and preserve the arrangement: Hold down the <Shift> key as you choose *File•Exit*.

So where do you find this great program? Use Explorer (one last time?) to navigate to the Windows\System32 folder, then drag winfile.exe to the folder of your choice within the Start Menu folder. Dropping the file into the folder creates a Shortcut. Now just choose the Shortcut from your Start menu

Stretch and Skew Gone Askew



MICROSOFT PAINT, the Windows 95 accessory, has a Skew command. In the Stretch and Skew dialog box, the *What's This?* help instructs you to enter a positive number to skew an object to the right, or a negative number to skew it to the left. However, typing a negative number brings up an error message stating that the entry must be an integer between 1 and 89. So how do I skew an object to the left?

R. G. Christensen, *Internet*
SOMETHING IS DEFINITELY askew in the Stretch and Skew dialog box. In the case of stretching, the problem rests with the misinformation contained in the help: Each value represents a percentage—'100%' means no change. To reduce one dimension of an image, choose *Image•Stretch/Skew*, select *Horizontal* or *Vertical* in the Stretch area, and type a value less than 100. (To change the other dimension, click OK and choose *Image•Stretch/Skew* again.) Values from 0 to 99 decrease the size, while values from 101 to 500 increase it.

Skewing is a bit trickier. If you want to skew in the direction shown in the Stretch and Skew dialog box pictures, no problem—just type a value between 1 and 89 and click OK. Skewing in the opposite direction, however, requires this work-around: First, choose *Image•Flip/Rotate* (or press <Ctrl>-R). Select *Flip horizontal* to skew horizontally, or *Flip vertical* to skew vertically. Click OK. Then choose *Image•Stretch/Skew*. Select *Horizontal* or *Vertical*, type a value, and click OK. Finally, press <Ctrl>-R again to open the Flip and Rotate dialog box. Select the same flip option as before and click OK to return your image to its proper orientation.

anytime you want to use File Manager.

If you'd like File Manager to be as convenient as My Computer, put a Shortcut to File Manager on your desktop or in the Start Menu\Programs\Startup folder.



Find files from this article on PC World Online at www.fileworld.com. Windows Tips welcomes your questions and tips and pays \$50 for published items. Contributing Editor Scott Dunn is a co-author of The PC Bible, 2nd Edition (Peachpit Press, 1995, 800/283-9444). See page 14 for contact information.

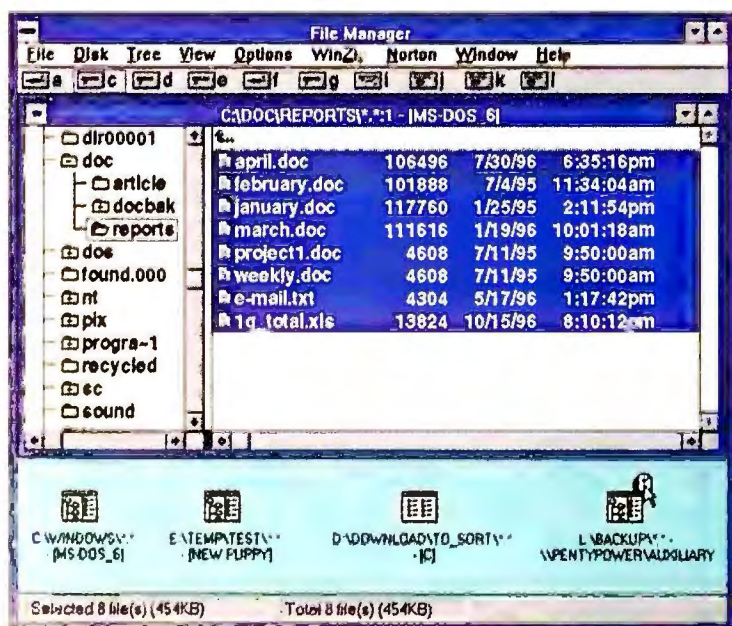
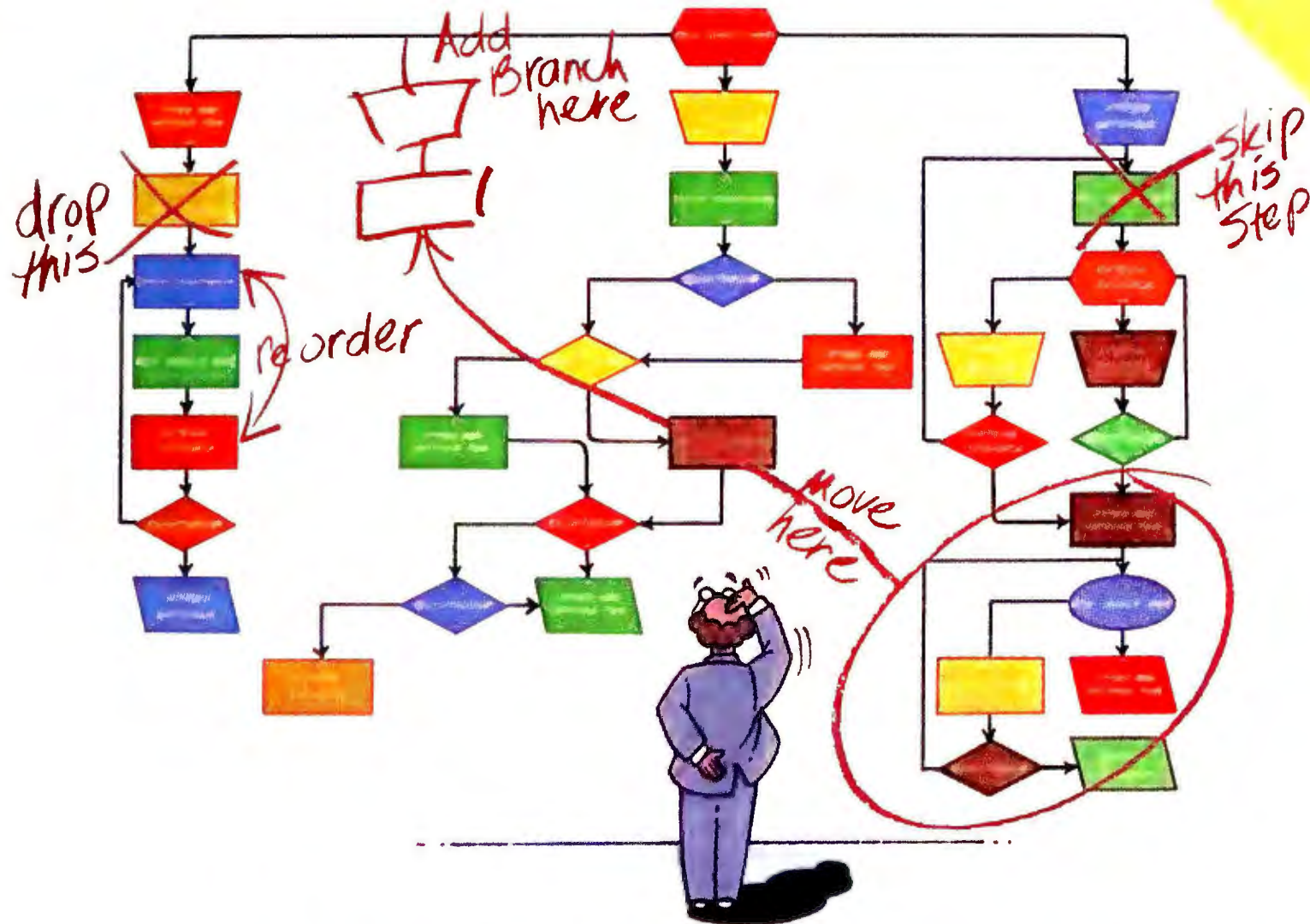


FIGURE 3: GET QUICK ACCESS TO FAVORITE DIRECTORIES in Windows 3.x by keeping minimized directory icons handy.

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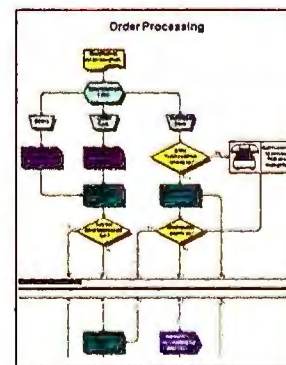
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Chart an Expanding Range in All Versions of Excel



I USE AN EXCEL workbook to track and chart daily sales. Since the number of data points changes every day, I have to update the chart manually so it includes the new data. How do I get the chart range to expand automatically?

Theresa Phelps, Lihue, Hawaii

WHEN YOU SELECT a chart series in Excel 97, the ranges used by the series are outlined on the worksheet. You could simply drag a corner of the outline to extend the range. But here's another approach for all versions of Excel: Instead of defining a range with cell addresses, use a formula.

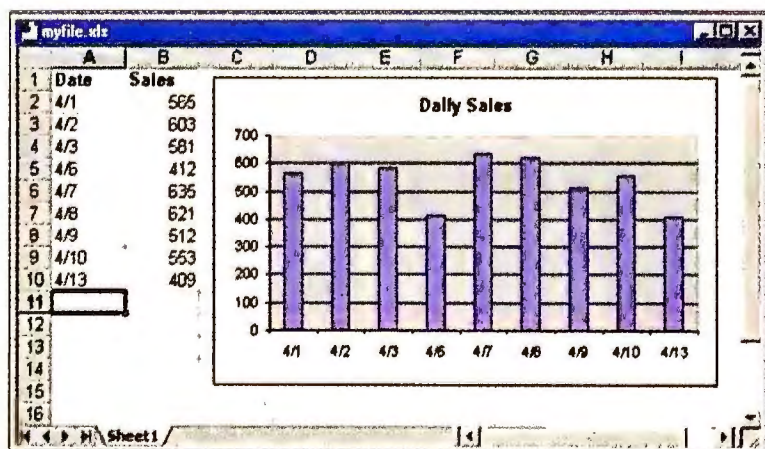


FIGURE 1: FORMULAS DEFINE THE DATE and sales ranges so the chart is automatically updated when you add new data in Excel.

To see how it works, follow these steps:

1. Create the worksheet shown in FIGURE 1.
2. Select *Insert>Name>Define* to bring up the Define Name dialog box. In the 'Names in workbook' field, enter **Date**. In the 'Refers to' field, enter this formula:

=offset(Sheet1!\$A\$2,0,0,counta(Sheet1!\$A:\$A)-1)

Click *Add*. Notice that the offset function refers to the first data point (cell A2) and uses the Counta function to get the number of data points in the column. Since column A has a heading in row 1, the formula subtracts 1 from the number.

3. Now type **Sales** in 'Names in workbook', and in 'Refers to' enter:

=offset(Sheet1!\$B\$2,0,0,counta(Sheet1!\$B:\$B)-1)

Click *Add*, and then *OK* to close the dialog box.

4. Activate the chart and select the data series.

In this example,

the formula in the formula bar will read:
=series(Sheet1!\$B\$1,Sheet1!\$A\$2:\$A\$10,Sheet1!\$B\$2:\$B\$10,1)

Replace the range references with the names you defined in steps 2 and 3. The formula should read:

=series(Sheet1!Date,Sheet1!Sales,1)

When you add data to columns A and B, the chart will be updated.

To use this technique for your own data, make sure that the first argument for the offset function refers to the first data point, and that the argument for Counta refers to the entire column of data. Also, if the columns used for the data contain any other entries, Counta will return an incorrect value.

SIMPLIFY SUBSCRIPT AND SUPERScript FORMATTING

IF YOU WORK ON STATISTICAL or mathematical text, you probably find it tedious to have to open Excel 97's Format Cells dialog box every time you need a subscript

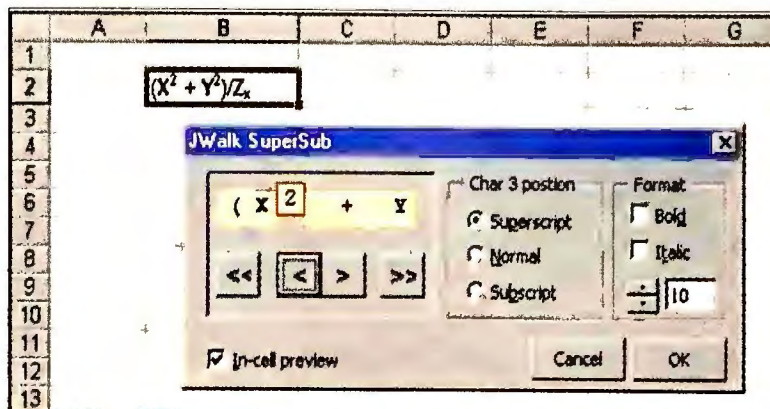


FIGURE 2: DOWNLOAD MY FREE SUPERSUB add-in to apply superscript or subscript formatting to characters in an Excel 97 cell.

Locate the Last Cell

DWAIN SMITH of Houston has noticed that after deleting rows or columns from an Excel worksheet, <Ctrl>-<End> no longer takes him to the last nonempty cell. Annoying, isn't it? Actually, Dwain, <Ctrl>-<End> takes you to the last cell that contains data or has ever been formatted in any way. In some cases you will need to delete all of the columns to the right of your data and all of the rows below your data to remove formatting. Then save the file and reopen it. Excel will now know what it should have known all along.

or superscript. Unfortunately, there's no toolbar button for this task. And you can't create a macro to apply subscript or superscript formatting to selected characters because a macro can't be executed while a cell is being edited.

I developed an add-in for Excel 97 that you may find helpful. The JWalk SuperSub add-in displays a dialog box (see FIGURE 2) that makes it easy to apply superscript, subscript, bold, italic, and font size formats to characters in a cell. Download a free copy of this add-in from www.j-walk.com/ss or from PC World Online. Look for the self-extracting file supersub.exe.

After downloading and extracting the add-in, select *Tools>Add-Ins* in Excel, click *Browse* to locate the supersub.xla add-in file (which the installer places on the desktop), and click *OK*.

To use this new tool, highlight a cell, then select *Tools>JWalk SuperSub*. The dialog box displays the cell's characters seven at a time. Click the arrow buttons to move through the characters, select one to format, then use the dialog box controls to apply a format. Check the *In-cell preview* box to see how the formatting looks.



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Create More Attractive Return Address Labels

EVERYONE NEEDS A few sheets of return address labels occasionally, and today's word processors can create them quickly. You just need to know a few tricks.

Word 6.0 and later. Word uses the default left-aligned Normal style for label text, but the program's standard menu and keyboard formatting commands don't work in the dialog box.

1. Select **Tools•Envelopes and Labels**.
2. Click the **Labels** tab in the Envelopes and Labels dialog box, then click **Full Page of the Same Label** if that option is not already selected. Click **Options**.
3. In the Label Options dialog box, choose the type of label you have on hand from the 'Product number' list. Click **OK**.
4. Type the return address you want to print, then highlight it. Next, right-click the highlighted text, choose **Font** from the pop-up menu, and select a font style and size for your address. You may want to apply a different font to the company name, as in **FIGURE 1**.
5. With the address still selected, right-click again, but this time select **Paragraph**. Choose **Centered** in the Alignment list of the Paragraph dialog box, then click **OK**.
6. To adjust the text vertically on the label, position the cursor at the beginning of the

first line of text, then press the **<Enter>** key. Click to the left of the resulting blank line, then right-click and select

Font from the pop-up menu. Adjust the type size in the Font dialog box as needed.

7. You'll probably need to print more sheets of these labels from time to time, so instead of clicking **Print** in the Envelopes and Labels dialog box, click **New Document**. Word then creates a document containing a full sheet of labels. Save this file for reuse the next time you need return address labels.

WordPerfect 6.1 and later. WordPerfect makes it easy to format labels, since you can use the program's normal commands and buttons. But getting a full sheet of the same label is a little tricky.

1. Select **Format•Labels**.
2. In the Labels dialog box, choose the type of labels you have on hand from the Labels list, then click **Select**.
3. WordPerfect will display a single blank label on the screen. Type your return address, formatting it using normal WordPerfect commands and toolbars.

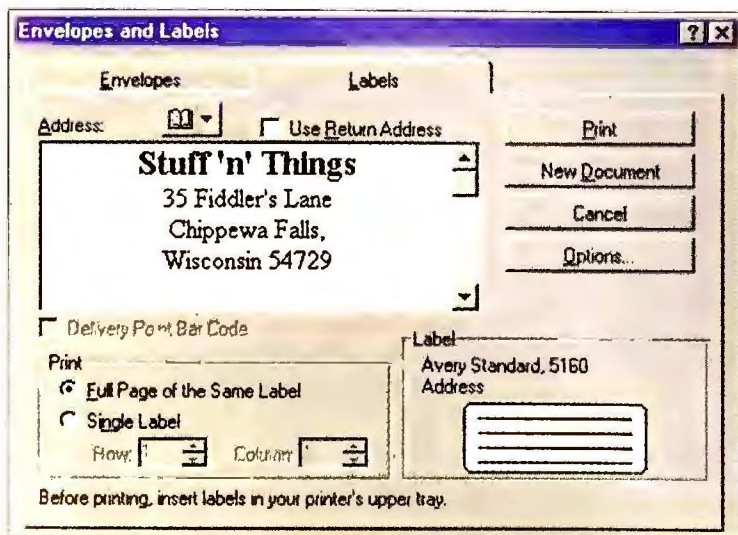
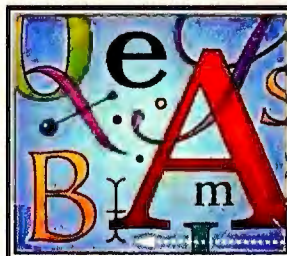


FIGURE 1: USE WORD'S ENVELOPES AND LABELS COMMAND to create and print sheets of return address labels.

4. To center your address horizontally on the label, click the **Alignment** icon on the toolbar and select **Center**.
5. To center the address vertically, select **Format•Page•Center**, then in the resulting dialog box select **Current and subsequent pages** and click **OK**. This works because the program treats each label as a page.
6. If you want to get really fancy, select **Format•Page•Border/Fill** and choose a border style and options from those

Single to Double to Single Space

SOME DOCUMENTS, such as papers submitted for review or publication, must be double-spaced for printing. Editing such a document on screen, though, is a pain. Here's how to have it both ways in Word 6.0 and later: Create and save your document in normal single-spaced format. Just before printing, press **<Ctrl>-A** to select the entire document, then press **<Ctrl>-2** to double-space the lines. Print as usual. Once printing is finished, press **<Ctrl>-A** again, then press **<Ctrl>-1** to return to single spacing.

available (see **FIGURE 2**). If you do this, be sure to deselect *Apply border to current page only* in the Page Border/Fill dialog box, if it's not already grayed out.

7. Once you like the way your label looks, select the text in the label, press **<Ctrl>-C** to

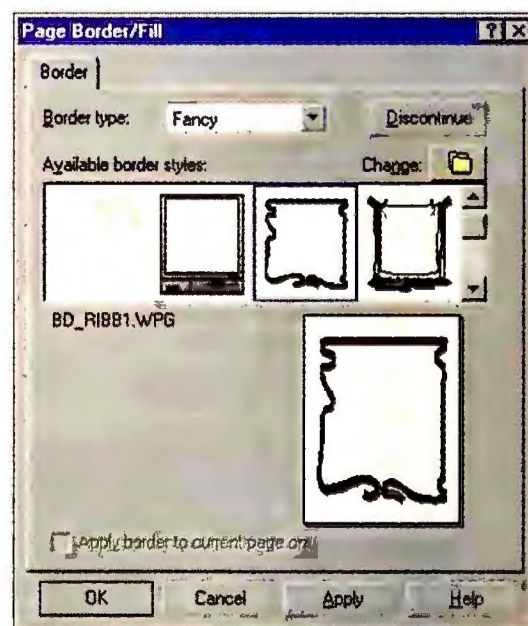


FIGURE 2: IN WORDPERFECT you can enhance address labels with a page border.

- copy it to the Clipboard, then press the right arrow key to remove highlighting.
8. Press **<Ctrl>-<Enter>** to create the next blank label, and press **<Ctrl>-V** to paste the formatted text. Repeat this step until you have a full page of labels.
 9. Save the resulting document.

THE INCREDIBLE SHRINKING DOCUMENT

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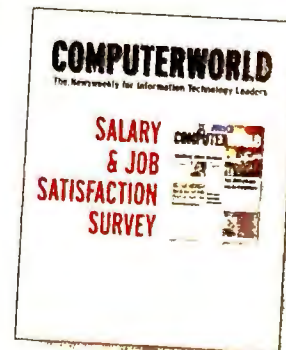


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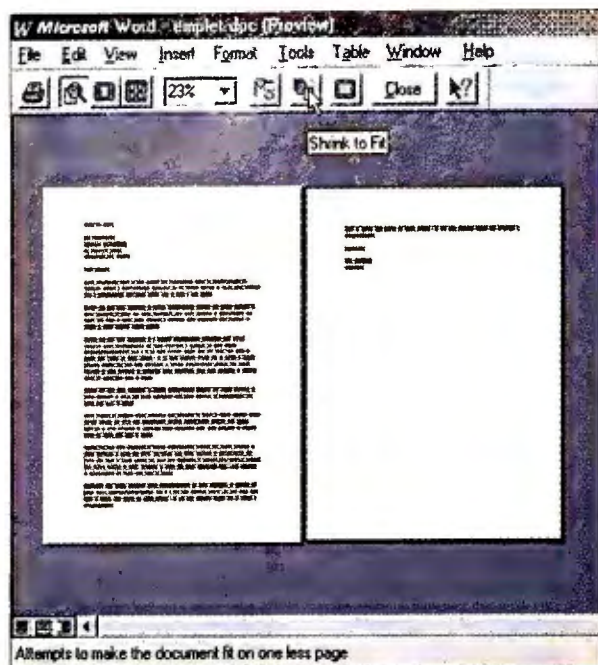


FIGURE 3: LET WORD SHRINK a document to fit, instead of having to edit it or fiddle with font sizes.

being sent companywide) for just a sentence or two, so you remove some text from the document or adjust font sizes to get it to fit. Why not let your word processor handle the job for you? Here's how:

Word 6.0 and later. Word reduces all font sizes in the document fractionally to make it fit on one page less than before. This technique works best on single-page documents that spill over only a bit. If you try it on a document that's half a page too long, the type may be too small to read.

1. Select **File•Print Preview**.
2. Click the **Shrink to Fit** icon on the toolbar, then click **Close** (see **FIGURE 3**).
3. If you decide to return to the previous layout, select **Edit•Undo Shrink to Fit**.

WordPerfect 6.1 and later. Again, don't shrink type so much that it's hard to read.

1. Select **Format•Make It Fit** (**Format•Make It Fit Expert** in version 6.1).
2. In the **Make It Fit** dialog box, choose a *Desired number of pages*, then choose options from the 'Items to adjust' boxes. In most cases, the default settings work fine. Click the **Make It Fit** button to finish.
3. Select **Edit•Undo** to reverse the reformatting, if necessary.

MAKE TOOLBARS EASY TO READ

MOST USERS OF Word and WordPerfect settle for the default toolbar settings, not realizing that there are ways to make these tools easier to see and use. Try these tips to change the way your toolbars appear.

In Word 6.0 and 7.0 right-click any toolbar, then select **Toolbars** from the pop-up menu. In Word 97, select **Customize** from the menu and click the **Options** tab. At the bottom of the **Toolbars** dialog box (see **FIGURE 4**), check or uncheck the boxes to change a toolbar's appearance. For instance, if you use a high-resolution display, select **Large Buttons** so icons are easier to see. The smaller the icons, however, the more of them you can add to a toolbar. In Word 7.0 and 8.0 you can also elect to display shortcut-key information when you move the mouse pointer over a button.

In WordPerfect 6.1 and 7.0, right-click a toolbar, select **Preferences** from the menu, then click **Options** in the **Toolbar Preferences** dialog box. In version 8.0, right-click a toolbar, select **Settings**, click **Toolbars** or **Property Bars** in the **Customize Settings** dialog box, then click **Options**.

Select or deselect buttons in the 'Button appearance' section (WordPerfect 8.0) or **Appearance** section (versions 6.1 and 7.0) of the resulting dialog box. You'll see the changes on the toolbar without having to close the dialog box. You can't change the size of buttons, but you can control the number of rows of buttons on any toolbar by changing the 'Maximum number of rows/columns to show' setting. Increasing this setting is a good idea if you've added text to your toolbars, since it allows more buttons to be displayed. When you're done, click **OK**, then click **Close**.

RECOVER ANY CORRUPTED FILE IN WORD

DO YOU HAVE A CORRUPTED Word document or an .exe file that won't run? You can open it in Word 7.0 or 8.0 and recover

at least the text in the file. Here's how:

1. Select **File•Open**, as usual.
2. In the 'Files of type' list, choose **Recover Text from Any File**.
3. Locate the file you want to open, select it, and click **Open**.
4. In the **Convert File** dialog box, again select **Recover Text from Any File**.

Once Word opens the file, you'll probably have to remove unwanted characters and reformat the text.

Caution: Select **File•Save As** immediately after you open files in this way, and save the document with a new file name. If you keep the original name, the program will save the file as a Word document, destroying the original format.

VISIT COREL'S FTP SITE FOR IMPORTANT UPDATES

IF YOU'RE USING WordPerfect 8.0, you'll want to visit Corel's FTP site periodically to download bug fixes and patches and to obtain filters for converting files to and from Microsoft Office 97 format. They're free. Point your browser to ftp.corel.com/pub/WordPerfect/wpwin/8/.

Here's a description of the files available at press time:

wp8cnv97.exe installs conversion filters for importing Word 97 and Excel 97 files into WordPerfect Suite 8.

wp8sp1.exe fixes a problem that causes WordPerfect to print blank pages. It also eliminates Invalid Page Fault errors when you print fully justified pages.

wp8sp2.exe updates WordPerfect Suite 8 and WordPerfect Professional, from version 8.0.0.225 to the current 8.0.0.268. (Check your version number by selecting **Help•About** in any suite application.)

qad2scb.exe converts the QuickArt clip art files included with WordPerfect Suite 7 into the Scrapbook.

For other free stuff for the Corel WordPerfect Suite, visit the company's Web site at www.corel.com.

Word Processing welcomes your questions and tips and pays \$50 for published items. Contributing Editor George Campbell is also a contributor to *The PC Bible* (Peachpit Press, 1995, 800/283-9444). See page 14 for contact information. ■

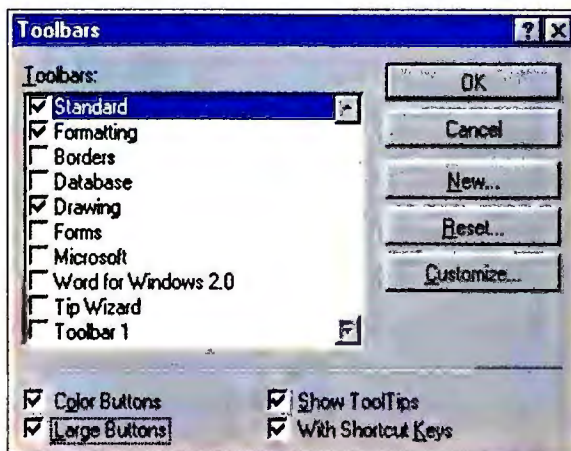


FIGURE 4: LARGE BUTTONS are easier to see, but smaller ones let you add more to a toolbar.

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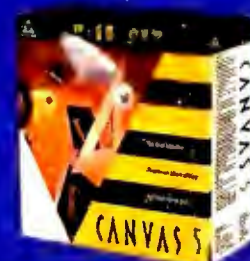
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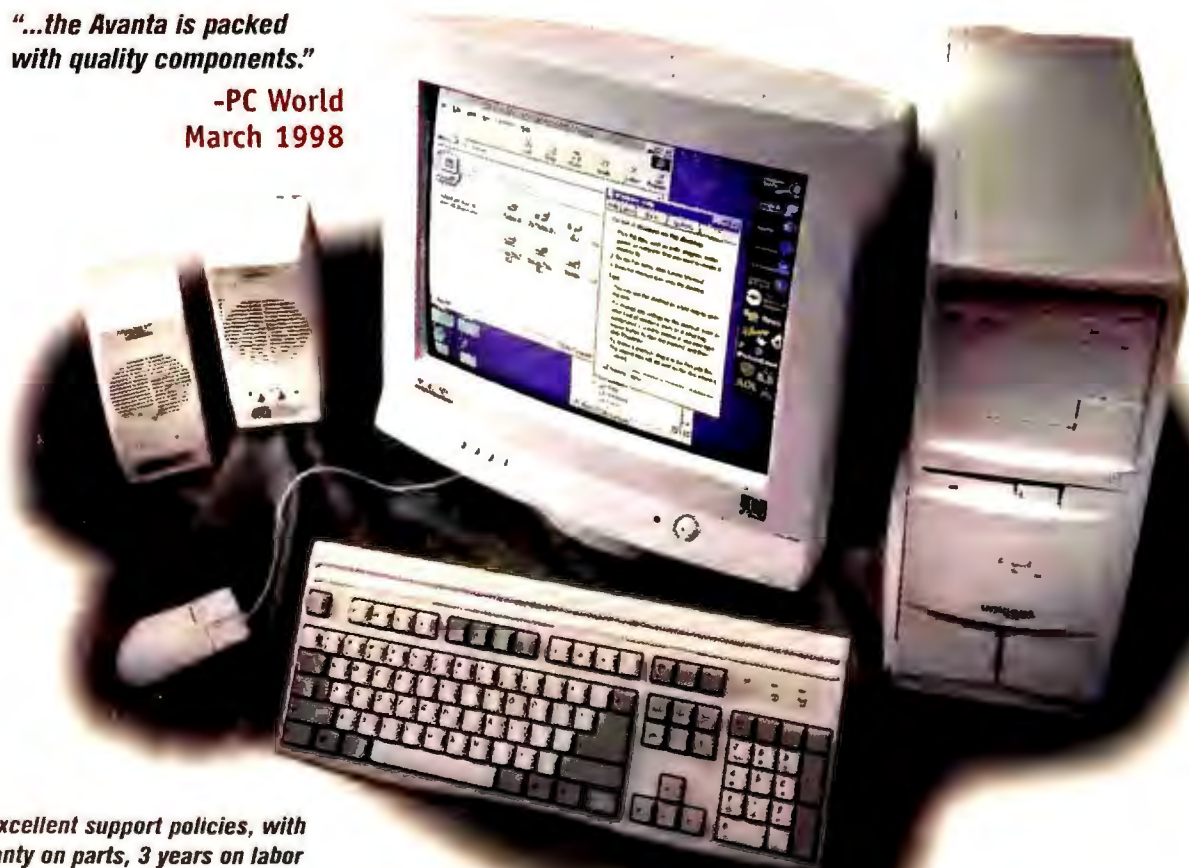
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WHILE I WAS INSTALLING Internet Explorer 4.0, it asked me if it could modify my Windows 95 desktop. Like a fool, I clicked Yes. Now my desktop is filled with weird gizmos, logos, and Microsoft symbols. How do I get my old desktop back?

Richard Tangard, Richmond, Virginia

IT TAKES A LOT of cheek for a browser to rearrange your desktop, but no one has ever accused Microsoft of courtesy. To get your desktop back under control, select *Start•Settings•Control Panel* and double-click the *Add/Remove Programs* icon. Scroll through the list on the *Install/Uninstall* tab to find the *Microsoft Internet Explorer* desktop, highlight it, and click the *Add/Remove* button as fast as you can.

You can also restore some settings by selecting *Start•Settings•Active Desktop•Customize my Desktop*, then clicking through the tabs. Under the *Web* tab is a setting, *View My Active Desktop as a Web Page*, that inflicts its own special tortures. Unclick it. Be sure to click the *Apply* button when you're done.

SIGN OUTLOOK EXPRESS MAIL WITH STYLE



I USE Outlook Express and would like to add a unique signature to my e-mail—something with fancy fonts or a picture. How can I do this?

David A. Giesen, Internet

INTERNET EXPLORER's mail program, Outlook Express, offers a stationery feature that lets you add unique, graphics-oriented signatures to your messages (see FIGURE 1). Here's how to use it:

Select *Tools•Stationery*, then go to the *Mail* tab and click the *Signature* button. To create a text signature, select the *Text* radio button and type your signature.

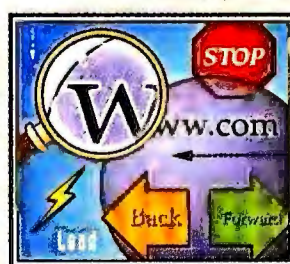
(Click *Add this signature to all outgoing messages* to make this the default setting.) Click OK twice.

If you want to

change fonts and other aspects of this text signature while you're composing a message, select *Format•Rich Text*, right-click the signature, and select from the menu. These settings are not stored, however, so you must follow these steps each time.

There is a way to make a permanent signature with fancy fonts and graphics, though: Create it as an HTML file, with graphics stored as GIF or JPEG files that the HTML file calls up (we'll use JPEG in the example below). In other words, you create your e-mail signature just as you would a Web page. Here's how:

1. Create the signature in a program that can store images or text as a JPEG file—Jasc's Paint Shop Pro or Adobe Photoshop, for instance. Type your name in a fancy font. Spray-paint it, draw it, or add other graphics if you wish. But before you turn into Picasso, remember to keep your



Post Web Graphics in the Right Format

TO MAKE YOUR WEB PAGE quick to download, store in JPEG format (.jpg) only those images that contain lots of colors and shading. Black-and-white or gray-scale pictures and pictures with large areas of a few colors should be stored as GIF files. GIF compresses images by storing in shorthand format large areas of a single color. So if your image has just a few areas of basic color, it will be much smaller in GIF than in JPEG format.

signature file small. You don't want to send 100KB over the Internet with each message. Crop your signature to keep its size down, and save it as a .jpg file (sig.jpg, for example) in *Program Files\Common Files\Microsoft Shared\Stationery*.

2. Write an HTML file for your signature. Create it in any word processor; it doesn't need to be elaborate. This is sufficient:

```
<html>
<body>

</body>
</html>
```

These instructions left-align the signature file (sig.jpg) you created in step 1.

Save the HTML instructions as a text-only file with an .htm extension (sig.htm, for example). Again, save it in *Program*

Files\Common Files\Microsoft Shared\Stationery.

3. Activate the HTML file as your stationery: Select *Tools•Stationery* and click the *Mail* tab. Click *This stationery*, click *Select*, and browse over to your signature file (*C:\Program Files\Common Files\Microsoft Shared\Stationery\SIG*). Click *Apply*.

4. In Outlook Express's New Message window, select *Format•Rich Text*, then *Tools•Send Pictures with message*. If you haven't chosen to add the signature to all outgoing messages, select *Insert•Signature*.

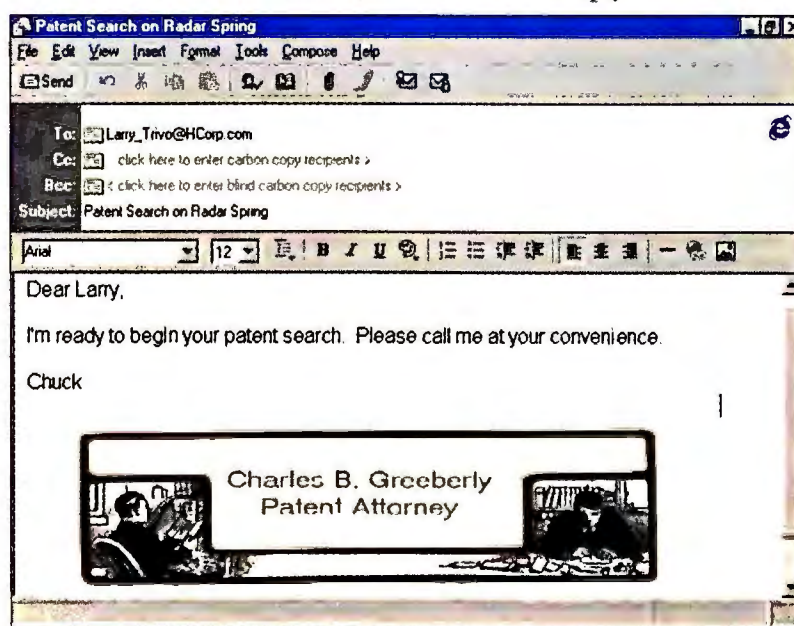


FIGURE 1: CREATE FANCY OUTLOOK EXPRESS SIGNATURES, but keep them small, and don't send them to those who can't read them.

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Optimum Res.	1,280 x 1,024 @89Hz	1,280 x 1,024 @88Hz	1,280 x 1,024 @88Hz	1,280 x 1,024 @79Hz	1,024 x 768 @87Hz	1,024 x 768 @87Hz

* Aperture grille pitch

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Circle 247 on reader service card

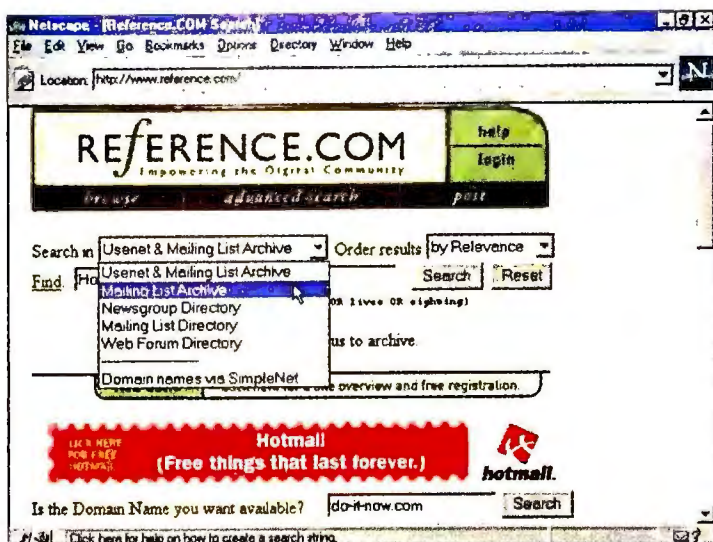


FIGURE 2: FIND YOUR WAY INTO ANY NET DISCUSSION, even private mailing lists, by heading to www.reference.com.

Make sure your recipients can view HTML files. The mail programs in Internet Explorer and Netscape Communicator can handle them, and America Online's mail system can display some graphics. But HTML messages end up as digital ragout on many corporate e-mail systems. And there is nothing more irritating than downloading a humongous message full of graphics you can't see.

One more tip: Outlook Express comes with some colorful stationery. To get it, select *Tools•Stationery*, click the *Mail* tab, click *This Stationery*, click *Select*, and browse until you find something you like.

FIND ELUSIVE DISCUSSIONS

THE INTERNET'S BEST information is shared in discussion groups—Usenet newsgroups (which you subscribe to with your browser's news feature); bulletin

boards on big Web sites; and mailing lists (which you subscribe to by e-mail). But in this ocean of online discussion, finding the groups that interest you isn't easy.

Fortunately, you can search all these groups by heading to www.reference.com (see **FIGURE 2**). Here are some hints for effective searching:

- Keep your search terms general; Reference.Com searches subject lists, not actual discussions.
- Search mailing lists

first; there are more of these on the Net than newsgroups.

- Reference.Com offers archives of many mailing list discussions, though not all. If an archive you'd like to read is missing, follow the list's sign-up information, or contact the person who runs the list.

SURF IN ANY LANGUAGE?

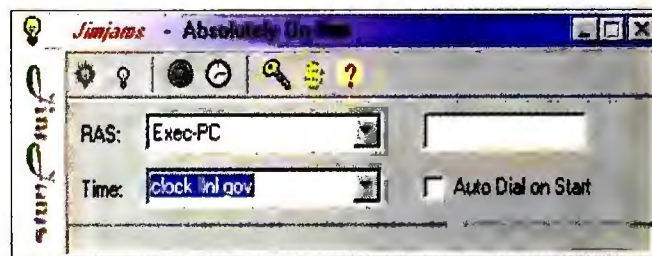
ALTAVISTA'S NEW TRANSLATION service (www.altavista.digital.com), still in beta at press time, automatically translates into English any Web page written in French, German, Italian, Portuguese, or Spanish. You just click *Translate*, and AltaVista's software translates the page in seconds.

But does it work?

You be the judge. On the left side of **FIGURE 3** is a Web page written in Italian; on the right is AltaVista's English translation of that page.


Keep Hanging On With Absolutely On-line

FEW THINGS ARE MORE aggravating than having your Internet service provider disconnect while you're downloading a large file, reading a long online article, or taking a coffee break. Absolutely On-line, a \$15 shareware utility from JimJams (www.jimjams.com), spits bits at your ISP every 60 seconds to keep the connection alive. You can also use it to automate log-ons.



Remember, pages written in a foreign tongue probably aren't indexed in English. So you'll need to know the Portuguese word for *platypus* before you can search any Portuguese Web pages on the subject.

Also, if you have overseas correspondents, you can type in an e-mail message, and AltaVista will translate it into the language you specify. But I wouldn't advise using this feature if you're a diplomat.

 Find files from this article on PC World Online at www.fileworld.com.

Internet Tips welcomes questions and tips and pays \$50 for published items. Contributing Editor Judy Heim is coauthor of *The Quilter's Computer Companion* (No Starch Press, 1997, 800/420-7240). See page 14 for contact information. ■



FIGURE 3: ALTAVISTA'S NEW LANGUAGE TRANSLATION SERVICE can be useful for cross-cultural Web cruising, but the beta we tested suffered from some limitations, as shown in this English translation (on the right) of an Italian Web site (on the left).

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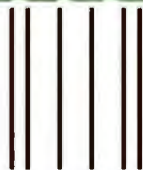
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The Webby Awards is proud to have brought you the first ever 3-D Webcast, plus a whole night of drinks, dancing, and debauchery in honor of the Web's best sites. But if you missed the bash, don't fret. We're maintaining an extensive multimedia archive of the evening's events, including live reports, glossy pictures, and plenty of video and audio clips, plus interviews and photos of the celebrities and attendees. We hope you enjoy it!

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Connect two PCs via an infrared link ♦ Fix nagging paper-out problems

Moving Monster Files Without Nets or Zip Drives

FACE IT—1.44MB just isn't what it used to be. When you're trying to move today's ever-larger documents, program files, and graphics between your laptop and desktop PCs, the venerable 3.5-inch floppy disk just can't hack it. If both computers are networked or if you can shuttle an external Zip-type drive between machines, you can still get by. Otherwise, here are three approaches you can try. (These methods also help cope with a flood of small files.)

SQUEEZE PLAY

YOU CAN'T MAKE your floppy disk bigger, but you can make your files smaller. File compression utilities often can shrink files to a quarter or less of their original size, possibly making files up to around 6MB fit onto a single floppy (see **FIGURE 1**). Two of the best such utilities are available

CABLE UP A PIPELINE

IF YOU'VE got a lot of data to move between two nearby machines, try connecting them by cable. Several software packages let you move data through a cable between either the serial or the parallel ports of two computers. If possible, always use the parallel ports—they're much faster.

Excellent data transfer utilities come in two remote-access software packages, Lap-Link 7.5 and PcAnywhere32 8.0. Both offer sophisticated features that speed up transfers, such as moving only new files or only files that have been updated. Both come with a parallel cable in the box.



If you don't need remote access software, there's a free but clumsier alternative: the Direct Cable Connection utility included in Windows 95. DCC actually establishes a network connection between the two computers using Window 95's Dial-Up Networking accessory. Once a link is established, the DCC interface lets you manipulate files by dragging

and dropping them between the two systems. You can also use the utility to install software on one PC using a CD-ROM drive located on another—which can come in very handy if your notebook lacks a CD-ROM drive.

You can access DCC through *Start•Programs•Accessories*. If you don't see it in the menu, click the *Add/Remove Programs* icon in Control Panel, click the *Windows Setup* tab, double-click *Communications*, check the *Direct Cable Connection* box,

New Keys for Old PCs

ON MOST NEW systems, the keyboard attaches to a round 6-pin connector commonly called a PS/2 connector. (The mouse attaches to an identical connector, which offers a rich source of confusion for folks who set things up a little too quickly.)

Older keyboards typically used a larger, 5-pin connector. If you've bought a newer keyboard whose connector doesn't match your older PC, there's a simple fix. You can buy an adapter at your local computer shop for less than \$10.

click *OK*, click *Apply*, and follow any further instructions. You may have to insert your Windows 95 CD-ROM or floppies.

DCC starts with a wizard program that must run on both machines. It asks you to designate one computer as the host (the one with the files) and one as the guest (the one to receive the files). This is a one-way relationship—the guest PC has access to the host PC, but not vice versa.

But before you start DCC on either machine, you must jump through quite a number of hoops.

Both machines need Dial-Up Networking, Client for Microsoft Networks, and the IPX/SPX network protocol. DUN can be installed in exactly the same manner as DCC. To install Client for Microsoft Networks, right-click the *Network Neighborhood* icon (on the desktop or in Explorer) and select *Properties*, then click the *Add* button, select *Client•Add•Microsoft*, and follow the prompts. Use the same procedure for IPX/SPX support, selecting *Protocol* this time instead of *Client*. Again, you may need your Windows 95 disc or floppies.

To let the guest machine access the host computer's files, you'll need to set the appropriate host drive or drives so that they can be shared. First go back to the Network Neighborhood Properties screen and click the *File and Print Sharing* button. Check *I want to be able to give others access to my files*, then right-click the proper drive icon in Explorer, select the *Sharing* tab, click the *Shared As* radio button, and click *Apply*. You'll also want to check ►

Compress That File!

File type	Average WinZip compression ratio (percent)	How much you can fit on a 1.44MB floppy (MB)
Word 7.0	61	3.6
Excel 7.0	73	5.1
HTML	69	4.6
JPEG image	2	1.5

FIGURE 1: HOW MUCH CAN YOU FIT on a floppy? Here are sample compression ratios for a few popular types of files.

in free trial versions from PC World Online: WinZip 6.3 from Nico Mak Computing and PKZip from PKWare.

If you can't squeeze everything onto one floppy, either of these utilities will let you compress your data across a span of floppy disks. If you need more than two or three floppies, mark each one clearly with numbers. Some floppies must be inserted into the drive at both the beginning and the end of the process, so don't lose track of the order.

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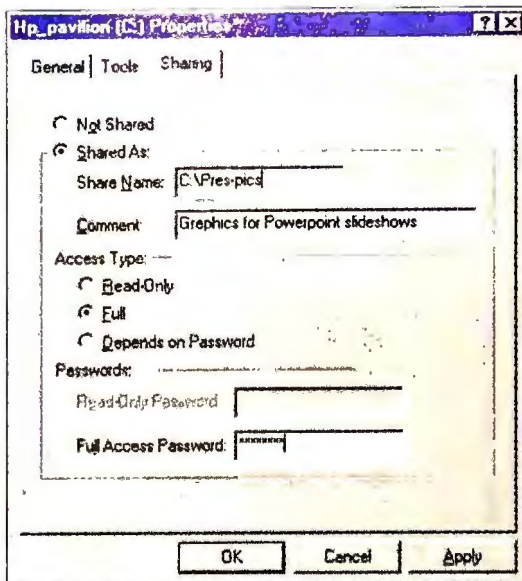


FIGURE 2: THE HOST PC MUST LEARN TO SHARE files before you can transfer them using Direct Cable Connection.

Full access for the drive (see **FIGURE 2**).

And, of course, you'll need a cable. You will find serial cables (called null modem cables) and parallel cables (also known as interlink or laplink cables) for less than \$20 at your local computer shop.

If speed is of the essence and your PCs have high-performance ports that support the Enhanced Parallel Port or Extended Capabilities Port standard, you may want to buy a DirectParallel Universal Cable. This device can sense what types of parallel ports are in use and optimize transfers accordingly.

CATCH THE RED-EYE

IF YOU HATE THE HASSLE of plugging and unplugging cables, check out an infrared connection—much like that in a television's remote control—for wireless two-way links between your laptop and your desktop.

An IR connection needs two components: software that supports infrared transfers, and an IR port attached to each computer. Most recent laptops come with an IR port installed. Your desktop machine needs an IR adapter that attaches to a serial, parallel, or network port.

Extended Systems makes the \$99 JetEye PC, which attaches to the desktop PC's serial port. This connection limits your transfer speeds to the serial port maximum of 115 kilobits per second. The IR ports on many laptops also top out at 115 kbps, so this may be no problem.

Transfers at up to 4 megabits per second are possible, but for this you need a more expensive adapter, like the \$285 Jet-

Eye Net Plus, which serves as a wireless network connection and plugs into a parallel or ethernet port. Also, make sure your notebook's IR port supports version 1.1 of the Infrared Data Association, or IrDA, standard.

In addition, you need the latest version (2.0) of the Windows 95 Infrared Communications Driver, which supports IrDA 1.1. To install or upgrade your PC to IrDA 1.1, download the latest version of the driver file, win95ir.exe, from Microsoft (premium .microsoft.com/support/kb/articles/q139/4/45.asp), and install it on your PC. If your system has IrDA 1.0, you must uninstall it first before installing the newer version.

Once the IR driver is installed, you can access the Windows 95 Infrared Monitor through a Control Panel icon. The Infrared Monitor tells you the status of connections and lets you set various options.

When you are ready, make sure the Infrared Monitor is running on both machines, then place the two computers so that their IR ports are within 3 to 6 feet of each other. When you have established an IR link, fire up a file transfer package that supports IR communications.

• **JetEye PC \$99, JetEye Net Plus \$285 street;** Extended Systems; 800/235-7576; www.extendedsystems.com

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• **LapLink 7.5 \$150 street;** Traveling Software; 800/343-8080; www.laplink.com

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• **PcAnywhere32 8.0 \$150 street;** Symantec; 800/441-7234; www.symantec.com

READER SERVICE ND. 7D1

• **DirectParallel Universal Cable \$70 street;** Parallel Technologies; 800/789-4784; www.lpt.com

READER SERVICE ND. 644

END THE PAPER CHASE



I UPGRADED the memory in my Hewlett-Packard LaserJet 4P printer from 2MB to 6MB, hoping to eliminate memory overrun errors. Since then, I continue to get a new error message on almost every print job, saying the printer is out of paper. Of course, there is paper in the printer. It seems to work okay when connected to other PCs. Any suggestions?

Michael J. Beller, London, Utah

YOU'RE NOT THE FIRST to be frustrated by this error message. Select *Start•Settings•Printer*, right-click your printer's icon, select *Properties* from the menu, click the *Device Options* tab, and examine the memory settings.

Then try replacing your printer cable. A cheap cable can often lead to problems with large data transfers—especially if it's more than 10 feet long. Make sure the cable you buy meets the IEEE 1284 standard; it will cost about \$20.

Second, try reinstalling your printer driver. (Double-click the *Add Printer* icon in the Printer window, and select your printer from the list.) If that doesn't work, try installing a driver for an earlier printer model from the same manufacturer. If that driver works, try downloading and installing the latest driver.



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Install a New Sound Card

HERE'S OUR SOUND advice: If you spend much time listening to your PC—running multimedia presentations, playing games, experimenting with digital music, or humming along with audio CDs while you work—you owe yourself some up-to-date sound hardware.

Older sound cards, especially the bare-bones models bundled with many PCs, often suffer from distortion, limited frequency range, and low signal-to-noise ratios (which means you hear hissing, humming, or clicking). These limitations can make PC audio less pleasurable, or even downright fatiguing. Installing a new sound card is a quick and relatively cheap fix, providing top-quality sound and features—such as “3D” Surround Sound—to support the latest programs.

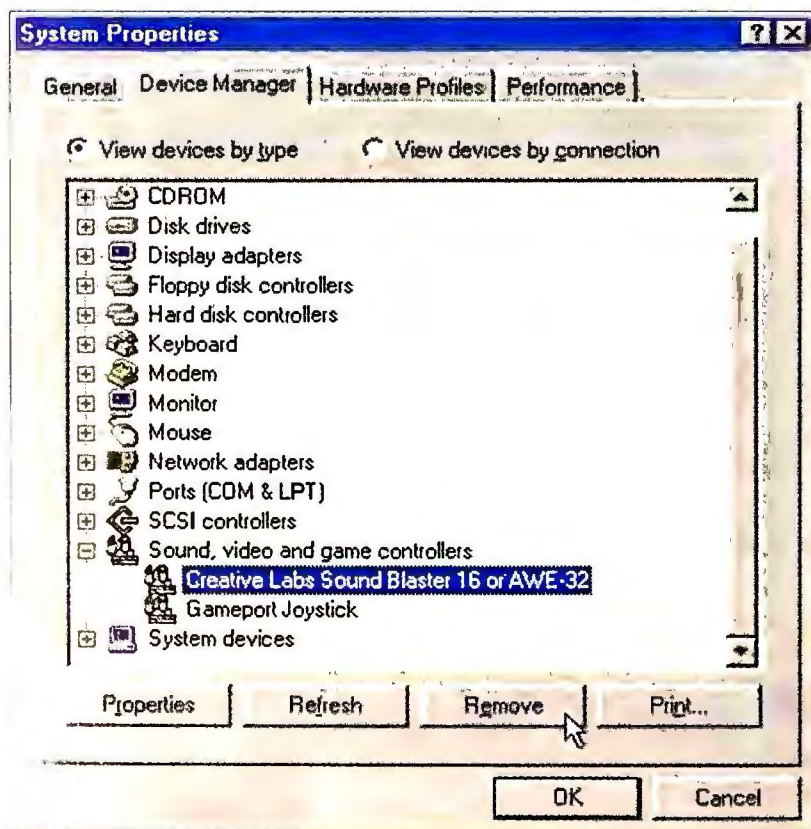
Choosing a new sound card can be confusing. Your local computer store or favorite mail-order firm will offer an extensive selection, usually starting in the \$50–75 range and going all the way to \$300 or more. (Most of these cards use the ISA bus; PCI sound cards are just entering the consumer market.) Stay away from the low end, and figure on paying \$150 or \$200 for a card like the Sound Blaster AWE64 Gold from Creative Labs (www.creaf.com). Another major supplier

1 Remove the old sound card software. To ensure a clean installation, first remove the software for your current sound card.

In Windows 95, select *Start•Settings•Control Panel*, double-click the *System* icon, and click the *Device Manager* tab. Click the plus sign next to the ‘Sound, video and game controllers’ heading, select your sound card model, and click *Remove* (see below). You’ll see a confirmation dialog box. Remove any other related sound card entries, such as a game port located on the sound card.

If your sound card had its own applications (such as mixers, sound file editors, or MIDI players), remove them by clicking the *Uninstall* icon in the respective program group or by selecting *Start•Settings•Control Panel* and double-clicking the *Add/Remove Programs* icon.

Are your PC’s audio features built directly into your motherboard instead of in an add-in sound card? (Check your system manual, take a peek inside the PC, or just look at how your existing speaker cables are plugged in.) If so, you’ll need to enter your PC’s setup program and disable the motherboard’s sound capabilities.

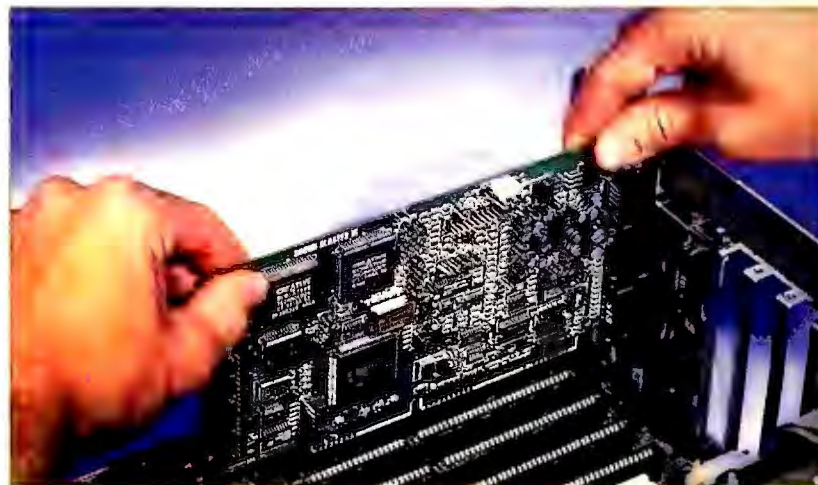
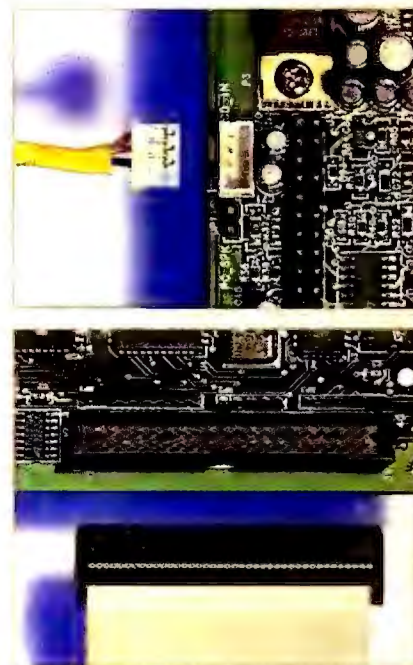


2 Remove the old sound card.

Turn off your PC, leaving it plugged in to provide a ground path for eliminating static that can damage the machine. Remove the cover.

Unplug all cables connected to the back of your current sound card (those for speakers, microphone, line-in audio, and so on). Inside the case a thin audio cable runs from the CD-ROM drive to the sound card (or to your motherboard). Remove the connector on the sound card (top). If the wide, gray data cable from your CD-ROM drive is connected to the card, remove it (above).

Next, remove the screw holding in the sound card and carefully lift out the card (below).



3 Install the new sound card. Before you add the new card, connect it to the audio cable from your CD-ROM drive. (You may need to buy a cable for this if your new sound card requires but does not provide one.) If your new card comes with a connector for your CD-ROM drive, connect the wide data cable. Make sure that the red wire on the cable is attached to pin 1 of the sound card’s connector. Note that a few

is Turtle Beach Systems, a subsidiary of Voyetra Technologies (www.voyetra.com).

Most sound cards include Musical Instrument Digital Interface capabilities you'll need for games and other sound-intensive applications. Make sure you invest in a card with *wavetable* MIDI synthesis, which generates the best-quality audio. The "16," "32," or "64" that is often part of a sound card's model number refers not to bits, but to the number of "voices" (notes) the card can play simultaneously. The more voices, the better the sound quality. Although all MIDI-equipped cards connect to MIDI-capable peripherals such as piano keyboards, the

higher-end cards usually include composition software for budding songwriters.

Before you buy a sound card, peek inside your PC to see if the CD-ROM drive's data cable connects to your old card. If it does, you'll need to buy a sound card that has an on-board CD-ROM interface; Turtle Beach offers some. If your CD-ROM drive is old and slow, consider purchasing a combination sound card/CD-ROM drive upgrade kit like the \$250 Sound Blaster Discovery AWE64/24X.

Some new sound cards use a different internal CD-ROM audio connector than the old card. If your new card doesn't have the right cable, you'll need to buy one.

Most speakers bundled with off-the-shelf PCs are inexpensive—and sound that way. To hear what your new sound card can deliver, you should upgrade your speakers as well. For best results, figure on paying at least \$150 to \$250 for true high-fidelity multimedia speakers. Two well-regarded speaker makers are Altec Lansing (www.altecmmm.com) and Cambridge Soundworks (www.hifi.com).

Sound cards can be tricky to install, although PCI models may make things easier. Here's how to install a new one.

Stan Miastkowski is a contributing editor for PC World.

sound cards (especially those with a CD-ROM interface) still have jumpers. If your new card does, check the manual to see whether you need to change the jumper settings. (The default settings are usually fine.)

Ground yourself by touching the chassis of your PC, then carefully install the new sound card (right). Firmly tighten the screw that holds it in.

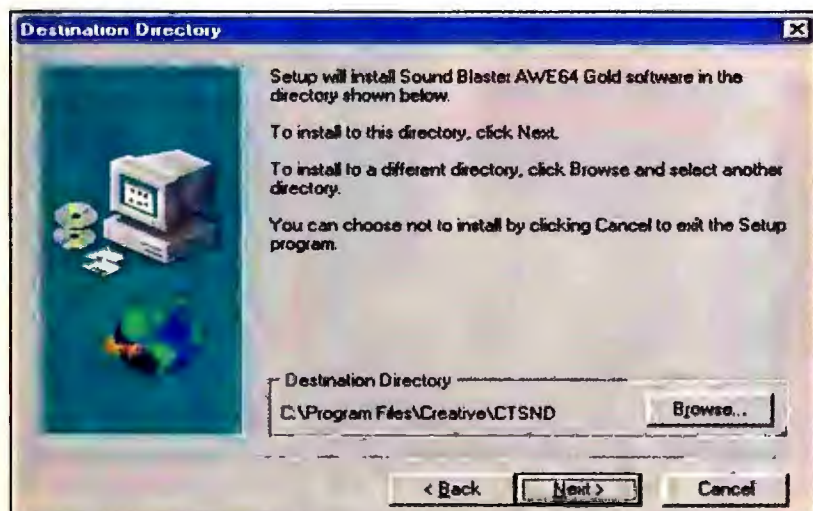
Reconnect the external cables. Note that some new cards, such as the Sound Blaster AWE64 Gold shown here, connect to speakers with RCA jacks. In that case, an adapter for your old speaker cable is usually included (see inset).

Don't put the cover back on your PC until you're sure that everything is working okay.



4 Install the sound card drivers and applications. Restart your PC. You should see a message saying that Windows has detected new hardware and is installing the correct software for it. At some point, you'll be asked to insert the installation floppy or CD-ROM that came with your new sound card.

Follow the setup directions on screen (below). You'll need to restart your PC again to complete the process and install the applications that came with your new sound card—usually a mixer, a sound file editor, and MIDI utilities. Follow the directions in the card's manual.



5 Listen up. To check out your new card, select *Start*Programs*Accessories*Multimedia*Media Player*. If Media Player isn't there, install it by selecting *Start*Settings*Control Panel*, double-clicking the *Add/Remove Programs* icon, and clicking the *Windows Setup* tab. Click the check box next to *Multimedia*, click *OK*, and follow the directions. You may need your original Windows 95 disc or floppies.

With Media Player on screen (below), select *File*Open* and choose one of the sound files in the Media directory. Then click the "play" button—the upright triangle toward the left. If you don't hear anything, check all connections and make sure that your speakers are turned on. If that doesn't work either, select *Start*Settings*Control Panel*, double-click the *System* icon, and click the *Device Manager* tab.

If there's a yellow exclamation point next to 'Sound, video and game controllers', you've got a hardware installation problem. Select *Start*Help* and search for the *Hardware Conflict Troubleshooter*. Follow the directions on screen.





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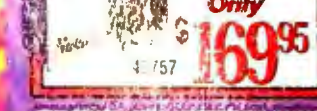
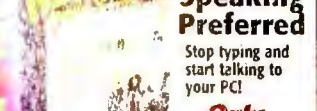
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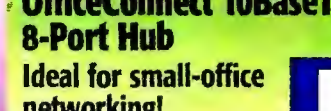
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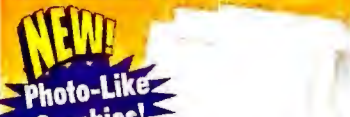


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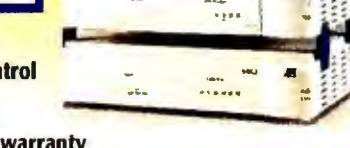
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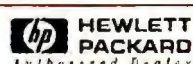
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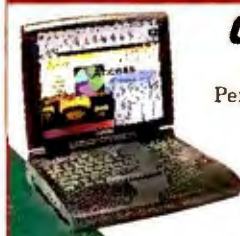
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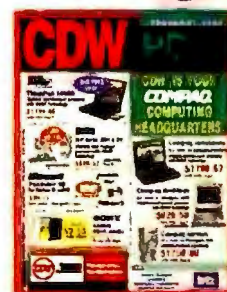
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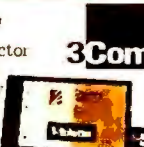
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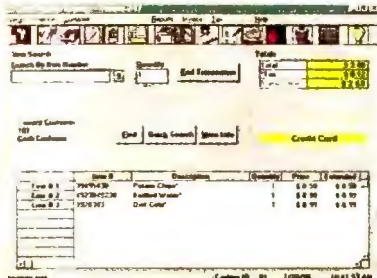
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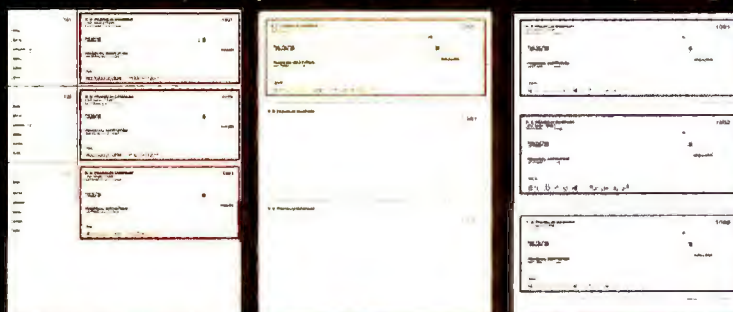
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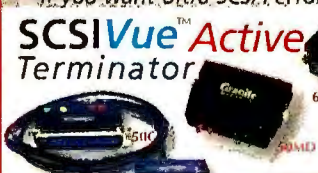
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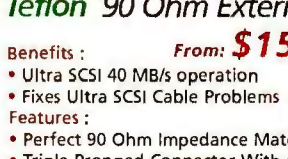
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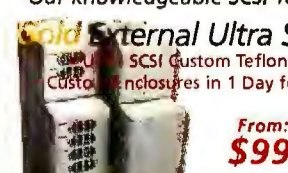
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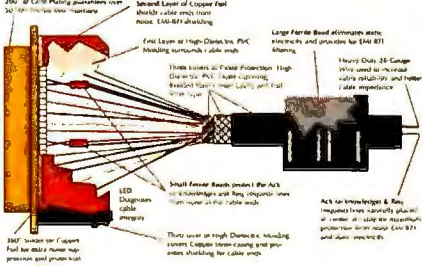
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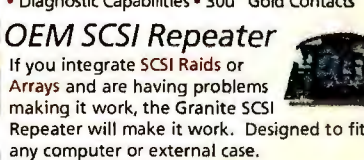
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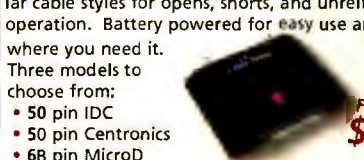
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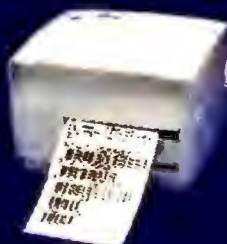


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1.8	\$119
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U-DMA	
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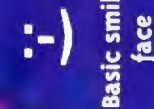
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Basic smiley face



Writer is surprised



Writer's lips are sealed



Writer just graduated

Net-cronym

A word made up of the initial letters (or groups of letters) of a phrase or name.

AFK away from the keyboard

BAK back at the keyboard

BCNU be seeing you

BRB be right back

BTW by the way

FWIW for what it's worth

TA great minds think alike

LO laughing out loud

PMU pardon my jumping in

ROTf rolling on the floor

RSM real soon now—phrase used to imply that something is supposed to happen, but probably will not unless a supreme being steps in

TAT turnaround time

TPTB the powers that be

TFN ta-ta for now

WB welcome back

WTC way to go

YMMV your mileage may vary (value to user may vary)

WYSIWYG what you see is what you get (what is visible on screen is what actually prints)

Anatomy of an E-mail Address

An e-mail address is made up of 3 parts:

Example:

feedback@webmagazine.com

1. feedback = username

a username has no spaces or capital letters; first and last name of an e-mail address are often separated by an underline or a hyphen, or are abbreviated

2. @

always separates the user name from the domain name

3. webmagazine.com = domain

a domain name is usually the name of a company, institution or organization the domain name always includes a 3 letter extension, indicating the type of organization: com = company or commercial organization, edu = educational institution gov = nonmilitary government site mil = military site net = special network service org = other organizations, usually nonprofit

Netiquette

Keep your voice down

Using capital letters on the Internet is equivalent to screaming. Instead, use asterisks around the text to be emphasized.

Be succinct

Keep it short.

Use net abbreviations whenever possible

See Net-cronyms.

Don't post ads, chain letters or business offers

unless the group or bulletin board was created for that purpose.

Stick to the topic

When entering an ongoing discussion, don't change the subject.

Content used with permission from Knowledge Exchange

Respect Forum and Newsgroup norms and mores

Observe before you participate. Make sure you've read the FAQ file before posting a message.

Respect your elders

Make sure you know who a newsgroup and forum's luminaries or elder statespersons are and show some respect for them.

Know your audience

Don't betray confidences or make official pronouncements (unless it's your place to do so). Pay attention to who will see your message.

Avoid sarcasm and subtleties

They can be easily misunderstood in cyberspace. use emoticons instead

Keep it simple

Take responsibility if you are misunderstood; apologize and then restate your message clearly.

Avoid evangelism

Don't use Forums or Newsgroups as a personal soapbox.

The Internet crosses national boundaries

Keep in mind that values vary from nation to nation around the world

*Note: tip your head to the right to see how to type Emoticons (except for hugs)



Not-funny



Sad



Hugging



Lots o' huggin'



Writer is wearing a Walkman



Writer is Elvis



Winking



Returning kiss



Tongue-tied



Tongue in cheek



Sticking out tongue



Licking your lips

Emoticon

In lieu of body language, please use.*



Writer wearing sunglasses on head



Writer wearing sunglasses



Laughing



Angry



Frowning



Screaming



Writer just graduated

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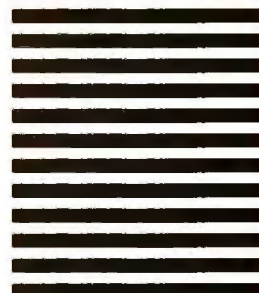
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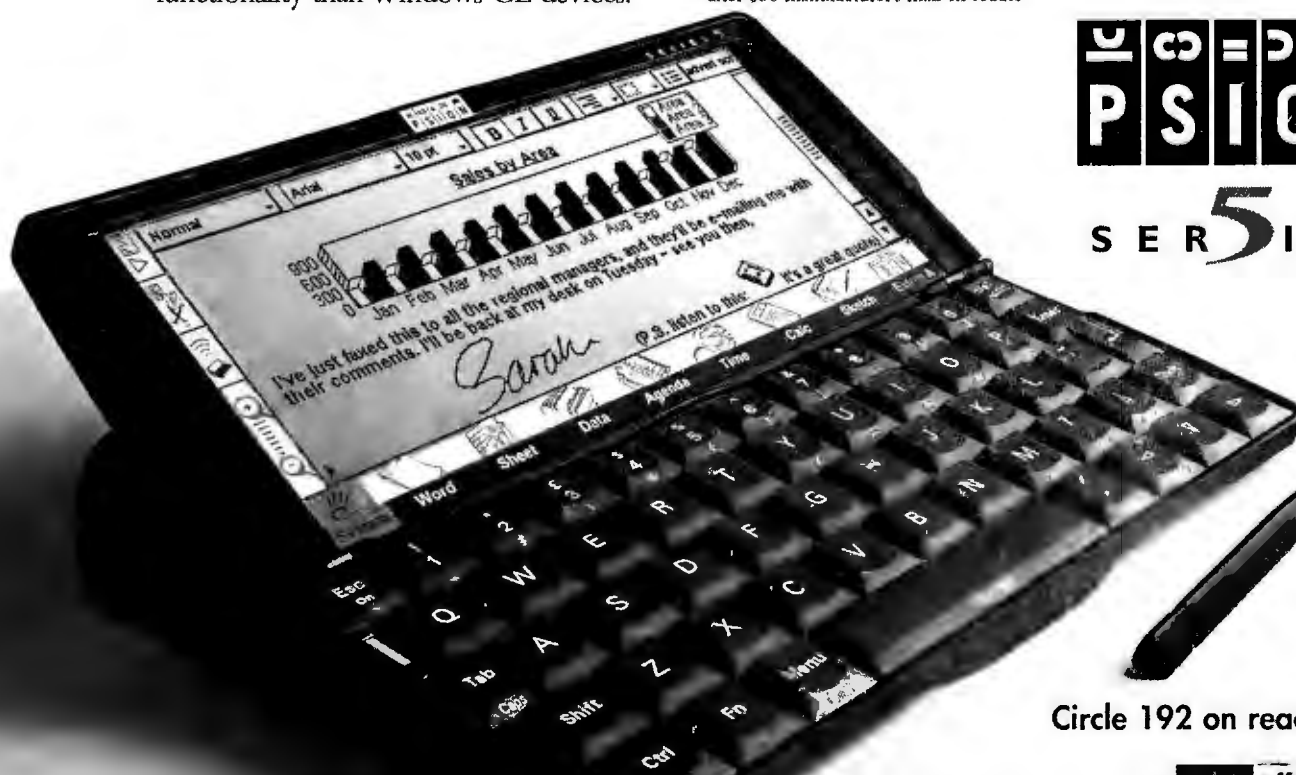
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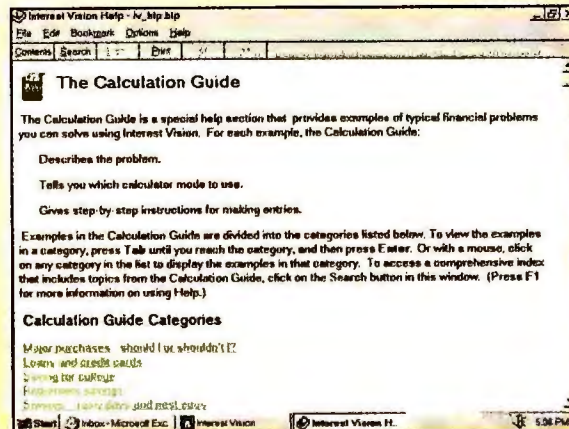
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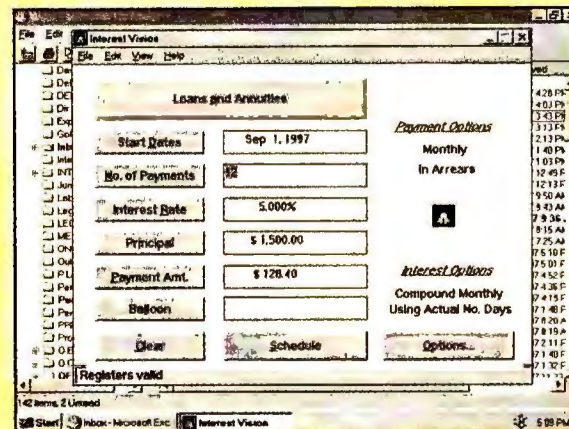
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A13-S2 5B	Intel Pentium II 300MMX	64MB	6.4 GB/32X	ATI RAGE II AGP	\$61*	\$1,749.99
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J34-1002	4.3 GB	Ultra DMA	11 msec	33 MB/S	5400 RPM	512KB	3.5"	3 years	\$209.99

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ITEM #	CAPACITY	INTERFACE	SEEK TIME	PRICE
W10-1136	3.1 GB	EIDE Mode 4	<12 msec	\$199.99*
W10-1140	5.1 GB	Ultra DMA	<11 msec	\$249.99*
W10-1142	6.4 GB	Ultra DMA	<9.5 msec	\$279.99*

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M122-2010	8.4 GB	EIDE Mode 4	12 msec	\$399.99*

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Web sites featuring compute-intensive content that makes slower systems (like the one you bought last week) seem like junkyard fodder.

The iron law of programming is "Software expands to soak up the cycles available." Does the latest flurry of speed mean the hardware folks are suddenly ahead of the curve?

Not for long. Remember when fast 386s gave DOS programs a dose of swiftness? Along came Windows 3.0 and associated bloatware. Just when Windows began to get the fast machines it craved, along came Windows 95 and even bigger programs. So now that the new generation of PCs can make Windows apps seem almost as fast as their DOS forebears, it's time for new speed traps to justify the purchase of another new machine. Where will they come from?

LETHARGY RULES

I PUT THAT QUESTION to consultant Boots Slocumb, a Lifetime Achievement in Lethargy honoree for innovations that make cutting-edge computers downright dull. Three days later, he offered the following state-of-the-slow thoughts:

Find Fast Minus: Performance dropping to the point where you can see every pixel dripping onto the screen as you type? It's probably just Microsoft Office's Find Fast indexing your files again. Find Fast Minus, expected in every copy of Office 98, will index all your files every three minutes. Now improved by including .exe, .dll, and graphics files; better still, you can't turn it off!

Expand-O-Rama: You probably thought 150 by 150 resolution was a trifle high for that thumbnail of yourself you posted on your



Now that PCs make
Windows apps seem
almost **as fast** as
their DOS forebears,
it's **time for new**
speed traps.

Web page. Wrongo! Expand-O-Rama automatically inflates every graphic on your system to 48,000 by 48,000 resolution in 64-bit color. All you do is press a button—and maybe buy an extra hard drive or ten. Will you detect a difference? Let's put it this way: Just loading one of these babies into Photoshop can take days!

RezExplode: Ready for high-definition TV? This stunning software-only implementation of MPEG-2 encoding transforms VHS cassettes into high-resolution DVD movies. Even that lowly 333-MHz Pentium II box can churn out several frames a day while you surf the Web!

A WEB OF YOUR OWN

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SureBoot: Is your machine truly ready to do its job? Are you certain? New uninterruptible Sure-Boot technology will remove any doubt. Sure-Boot resides in the BIOS of your new machine. First it tests memory hundreds of times; then it checks and rechecks every last byte on your hard drive; and finally it writes thousands of pat-

terns to your video card. A mere two hours at the beginning, middle, and end of every working day (on a Pentium II-333), and you'll know you can rule out hardware as the cause of any problems that arise, at least most of the time.

Mr. Slocumb, whose tie tack bears the logo "Better Living Through Sloth," also hopes 300-bps modems will make a comeback this year. But you probably guessed that already.

PC World contributing editor Stephen Manes is a columnist for the New York Times and is half of the Digital Duo, a new technology program that premiered on public television last fall. ■



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- ★ Upgrade to 128MB SDRAM, add \$199.

\$2799

Business Lease⁵: \$102/Mo., 36 Mos.
Order Code #590303

DELL DIMENSION XPS D266 266MHz PENTIUM II PROCESSOR FEATURING MMX TECHNOLOGY

Common features listed above plus:

- 64MB SDRAM Memory
- 6.4GB Ultra ATA Hard Drive (9.5ms)
- 1000TX 17" (15.9" v.i.s., .26dp) Trinitron Monitor
- STB nVidia 4MB 3D AGP Video Card
- 32X Max⁴ Variable CD-ROM Drive
- NEW Turtle Beach Montego A3D 64 Voice Sound Card
- Altec Lansing ACS-90 Speakers
- 3Com® 3C905 Fast EtherLink™ XL 10/100 PCI Card

\$2299

Business Lease⁵: \$84/Mo., 36 Mos.
Order Code #590302

DELL DIMENSION XPS D233 233MHz PENTIUM II PROCESSOR FEATURING MMX TECHNOLOGY

Common features listed above plus:

- 32MB SDRAM Memory
- 4.3GB Ultra ATA Hard Drive (9.5ms)
- 800HS 15" (14.0" v.i.s., .26dp) Trinitron Monitor
- STB nVidia 4MB 3D AGP Video Card
- 32X Max⁴ Variable CD-ROM Drive
- ★ Upgrade to 64MB SDRAM, add \$99
- ★ Upgrade to a 1000LS 17" (15.9" v.i.s.) Monitor, add \$79.
- ★ Upgrade to a 3Com 3C905 Fast EtherLink XL 10/100 PCI Card, add \$

\$1699

Business Lease⁵: \$62/Mo., 36 Mos.
Order Code #590301

MEGAHERTZ AND MEGAB

DELL DIMENSION DESKTOPS FOR HOME

Common features: ♦ Mini-Tower Model ♦ 512KB Integrated L2 Cache ♦ 56K Capable** U.S. Robotics x2 WinModem ♦ 3.5" Floppy Disk Drive ♦ Two USB Ports ♦ MSHome Essentials98 with Money98 ♦ McAfee VirusScan ♦ MS Windows 95 ♦ MS Internet Explorer ♦ MS IntelliMouse ♦ 3 Year Limited Warranty† with 1 Year On-site³ Service **Upgrades:** ♦ 3 Years On-site³ Service, add \$99 ♦ HP ScanJet 5100Cse Scanner, add \$299 ♦ MS Sidewinder Pro, add \$69 ♦ Riven (the sequel to Myst), add \$59

NEW DELL DIMENSION XPS D333 333MHz PENTIUM II PROCESSOR FEATURING MMX TECHNOLOGY

Common features listed above plus:

- 128MB SDRAM Memory
- 8.4GB Ultra ATA Hard Drive (9.5ms)
- NEW 1600HS 21" (19.8" v.i.s., .26dp) Trinitron Monitor
- Diamond 8MB 3D AGP Video Card
- 32X Max⁴ Variable CD-ROM Drive
- Integrated Yamaha Wavetable Sound
- NEW Altec Lansing ACS-495 Full Dolby Surround Sound Speakers with Subwoofer
- Dell Quietkey Keyboard

\$3499

Personal Lease⁵: \$169/Mo., 24 Mos.⁵
Order Code #500304

DELL DIMENSION XPS D300 300MHz PENTIUM II PROCESSOR FEATURING MMX TECHNOLOGY

Common features listed above plus:

- 128MB SDRAM Memory
- 6.4GB Ultra ATA Hard Drive (9.5ms)
- 1200HS 19" (17.9" v.i.s., .26dp) Monitor
- STB nVidia 4MB AGP Video Card
- 2X DVD-ROM Drive and Decoder Card
- NEW Turtle Beach Montego A3D 64 Voice Sound Card
- Altec Lansing ACS-295 Speakers with Subwoofer
- Dell Quietkey Keyboard
- ★ Upgrade to an 8.4GB Ultra ATA Hard Drive, add \$49.

\$2999

Personal Lease⁵: \$145/Mo., 24 Mos.
Order Code #500303

DELL DIMENSION XPS D266 266MHz PENTIUM II PROCESSOR FEATURING MMX TECHNOLOGY

Common features listed above plus:

- 64MB SDRAM Memory
- 6.4GB Ultra ATA Hard Drive (9.5ms)
- 1000TX 17" (15.9" v.i.s.) Trinitron Monitor
- STB nVidia 4MB AGP Video Card
- 32X Max⁴ Variable CD-ROM Drive
- Integrated Yamaha Wavetable Sound
- Altec Lansing ACS-295 Speakers with Subwoofer
- Iomega Zip 100MB Internal Drive
- Dell Comfort Key Keyboard

\$2399

Personal Lease⁵: \$117/Mo., 24 Mos.
Order Code #500302

DELL DIMENSION XPS D233 233MHz PENTIUM II PROCESSOR FEATURING MMX TECHNOLOGY

Common features listed above plus:

- 32MB SDRAM Memory
- 4.3GB Ultra ATA Hard Drive (9.5ms)
- 1000LS 17" (15.9" v.i.s.) Monitor
- STB nVidia 4MB AGP Video Card
- 32X Max⁴ Variable CD-ROM Drive
- Integrated Yamaha Wavetable Sound
- Altec Lansing ACS-90 Speakers
- Dell Quietkey Keyboard
- ★ Upgrade to a 6.4GB Ultra ATA Hard Drive, add \$49.

\$1899

Personal Lease⁵: \$93/Mo., 24 Mos.
Order Code #500301



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Encyclopedia
Outlook 98
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Paintings Workshop 2.0
Picture Collection

Software Upgrades:

Lotus Tax, add \$55.
Quicken Deluxe 98, add \$62.
Game Pack I (Command & Conquer:
Red Alert, Myst and WarCraft II), add \$59.

DELL WORKSTATION

DELL WORKSTATION 400
NEW 333MHz PENTIUM II PROCESSOR
FEATURING MMX TECHNOLOGY
DUAL PROCESSOR CAPABLE

- 256MB ECC EDO Memory (512MB Max)
- 9.1GB Ultra-Wide SCSI-3 Hard Drive
- 1600HS 21" (19.8" v.i.s., .26dp) Trinitron Monitor
- Matrox 8MB WRAM PCI Video Card
- 24X Max⁵ Variable SCSI CD-ROM
- Integrated Sound Blaster Pro Compatible Sound
- Integrated 3Com EtherLink XL 10/100
- Remote Manageability via DMI 2.0
- MS Windows NT[®] Workstation 4.0
- Microsoft Mouse
- 3 Year Limited Warranty[†] with 1 Year On-site[^] Service

\$4999

Business Lease^o: \$177/Mo., 36 Mos.
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DELL POWEREDGE[®] SERVERS

Common features: • 512KB Integrated L2 ECC Cache • Integrated PCI Ultra-Wide SCSI-3 Controller • Intel Pro/100B PCI Ethernet Adapter • HP OpenView[™] NNM Special Edition • 24X Max⁵ Variable SCSI CD-ROM Drive

DELL POWEREDGE 2200 SERVER
NEW 333MHz PENTIUM II PROCESSOR
DUAL PROCESSOR/RAID CAPABLE
WORKGROUP SERVER

Common features listed above plus:

- 128MB ECC EDO Memory
- 9GB Ultra-Wide SCSI-3 Hard Drive
- 12/24GB Variable SCSI DAT Tape Backup Unit
- 6 Expansion Slots: 3 PCI/3 EISA
- 6 Drive Bays: 3 External 5.25"/3 Internal 3.5"
- 3 Years Next-Business-Day On-site[^] Service
- 7x24 Dedicated Server Hardware Technical Telephone Support

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Business Lease^o: \$159/Mo., 36 Mos.
Order Code #250119

DELL POWEREDGE 2200 SERVER
266MHz PENTIUM II PROCESSOR
DUAL PROCESSOR/RAID CAPABLE
WORKGROUP SERVER

Common features listed above plus:

- 64MB ECC EDO Memory
- 4GB Ultra-Wide SCSI-3 Hard Drive
- APC Smart-UPS 700W Power Supply
- 6 Expansion Slots: 3 PCI/3 EISA
- 6 Drive Bays: 3 External 5.25"/3 Internal 3.5"
- 3 Years Next-Business-Day On-site[^] Service
- 7x24 Dedicated Server Hardware Technical Telephone Support

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Business Lease^o: \$109/Mo., 36 Mos.
Order Code #250123

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DELL INSPIRON[™] 3000 NOTEBOOKS

Common features: • Modular Options Bay accepts 24X Max⁵ Variable CD-ROM, 3.5" Floppy Drive (both included) or Optional 2nd Smart Lithium Ion Battery • 512KB L2 Cache • **Stereo Speakers with 3D Surround Sound and Yamaha Software Wavetable** • Zoom Video and USB Ports • Smart Lithium Ion Battery • IrDA Ready/Fast IR1.1 • MS Windows 95 • MS Internet Explorer • Touchpad • Extendable 1 Year Limited Warranty[†] • Upgrade to a 3 Year Limited Warranty[†] add \$99

DELL INSPIRON 3000 M266XT
266MHz PENTIUM PROCESSOR
WITH MMX TECHNOLOGY

Common features listed above plus:

- 13.3" XGA Active Matrix TFT Display
- 64MB SDRAM Memory
- 4GB Ultra ATA Hard Drive
- 128-bit Graphics Accelerator with 65K Colors at 1024x768
- Capable[™] K-Flex Modem
- Leather Carrying Case
- MS Office 97 Small Business Edition
- 6.9 Pounds*
- IrDA Port Replicator, add \$159.
- 2nd Smart Lithium Ion Battery, add \$169.

\$3799

Business Lease^o: \$134/Mo., 36 Mos.
Order Code #890321

DELL INSPIRON 3000 M266XT
266MHz PENTIUM PROCESSOR
WITH MMX TECHNOLOGY

Common features listed above plus:

- 13.3" XGA Active Matrix TFT Display
- 64MB SDRAM Memory
- 3.2GB ATA Hard Drive
- 128-bit Graphics Accelerator with 65K Colors at 1024x768
- Leather Carrying Case
- MS Office 97 Small Business Edition
- 6.9 Pounds*
- ★ Upgrade to 96MB SDRAM, add \$199.
- ★ Upgrade to a 4GB Ultra ATA Hard Drive, add \$99.

\$2999

Business Lease^o: \$109/Mo., 36 Mos.
Order Code #890323

DELL INSPIRON 3000 M233ST
233MHz PENTIUM PROCESSOR
WITH MMX TECHNOLOGY

Common features listed above plus:

- 12.1" SVGA Active Matrix TFT Display
- 48MB SDRAM Memory
- 3.2GB ATA Hard Drive
- 128-bit Graphics Accelerator with 16 Million Colors at 800x600
- MS Office 97 Small Business Edition
- 6.4 Pounds*
- ★ Upgrade to a 13.3" XGA Active Matrix TFT Display, add \$200.
- ★ Upgrade to 80MB SDRAM, add \$199.
- ★ 2nd Smart Lithium Ion Battery, add \$169.

\$2499

Business Lease^o: \$91/Mo., 36 Mos.
Order Code #890309

DELL INSPIRON 3000 M200ST
200MHz PENTIUM PROCESSOR
WITH MMX TECHNOLOGY

Common features listed above plus:

- 12.1" SVGA Active Matrix TFT Display
- 32MB SDRAM Memory
- 3.2GB ATA Hard Drive
- 128-bit Graphics Accelerator with 16 Million Colors at 800x600
- MS Office 97 Small Business Edition
- 6.4 Pounds*
- ★ Upgrade to a 233MHz Pentium Processor, add \$200.
- ★ Upgrade to 64MB SDRAM, add \$199.
- ★ Upgrade to a 4GB Ultra ATA Hard Drive, add \$99.

\$2199

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- Mini-Tower Model
- ★ **64MB SDRAM Memory**
- 512KB Integrated L2 Cache
- ★ **6.4GB Ultra ATA Hard Drive (9.5ms)**
- ★ **1200HS 19" (17.9" v.i.s.) Monitor**
- ★ **NEW Diamond Permedia 2 8MB 3D AGP Video Card**
- 32X Max[^] Variable CD-ROM Drive
- Microsoft® Office 97 Small Business Edition Plus Bookshelf 98; McAfee VirusScan
- Microsoft Windows® 95 and Internet Explorer
- Dell® Quietkey® Keyboard
- Microsoft IntelliMouse®
- 3 Year Limited Warranty¹ with 1 Year On-site[^] Service
- ★ **Upgrade to Integrated Yamaha Wavetable Sound and Altec Lansing ACS-90 Speakers, add \$89.**
- ★ **Upgrade to 128MB SDRAM, add \$199.**
- ★ **Upgrade to an 8.4GB Ultra ATA Hard Drive, add \$49.**

\$2499

Business Lease[®]: \$91/Mo., 36 Mos.
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Prepare to go roaring into 1998 with more PC processing power than you've ever had before. The Dell Dimension® XPS D333 features the latest Pentium® II processor from Intel, the 333MHz. The XPS D333 contains new components especially selected to harness the additional power. Like the new Diamond Permedia 2 8MB 3D AGP Video Card, which takes advantage of the high-end Accelerated Graphics Port to render 3D and 2D video with amazing speed and clarity. A 19" (17.9" v.i.s.) high-resolution monitor. And our optional 8.4GB Ultra ATA hard drive, ideal for storing and retrieving massive graphics and data files. So if your New Year's resolution was to work faster and smarter, then pick up the phone and give us a call. Or visit our website. And leave 1997 behind in a blur.



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