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PC WORLD

December 1995 $4.95

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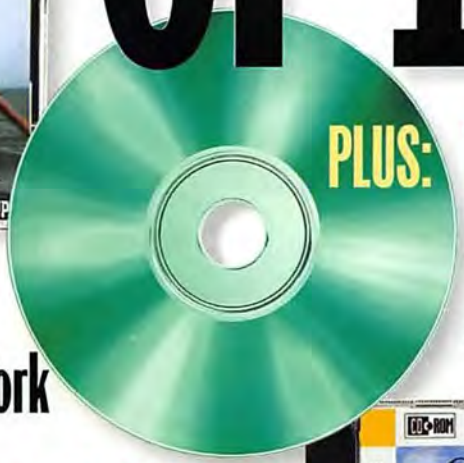

PLUS:

The PC World Top 100

PCs, Printers, Monitors, Modems, and Graphics Boards

Plug and Play

How to Make It Work

Microsoft Office 95

Is It Worth It?

FREEZE OVER?

You won't find all this with conventional monitors in this class.

Speaking of typical, everyday monitors, there's one thing you should remember: you don't have to settle for the monitor that comes bundled with the system.

In fact, these days it makes sense to be very selective. For example, we've developed our MultiSync XV17 to optimize today's software applications that are more involved than ever before. There's simply more information which needs to be displayed on the screen.

Our XV17 can accommodate all this on-screen information, and it does it surprisingly better than the typical monitor. Plus, a bigger screen helps eliminate constant scrolling, which can only help overall productivity. And considering all of the advantages of larger monitors, a 17" display won't be obsolete in the near future.

So if you're looking for an affordable high-performance monitor, we suggest the MultiSync XV17, and the entire XV Series. They're designed to go above and beyond your expectations. Not your price range. Call 1-800-NEC-INFO for more information. Or for information sent via your fax, just call NEC FastFacts™ at 1-800-366-0476 and request catalog #1.

The MultiSync XV Series offers optional accessories like the AudioTower™ Speaker System shown.

SEE, HEAR AND FEEL THE DIFFERENCE.™

NEC

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DID SOMETHING

Well, here's something you probably didn't expect. Those premium NEC monitors that always seemed a bit beyond your reach have now eased their way right into your price range. Introducing the NEC MultiSync XV Series. Featuring our new 17" monitor (15.6" viewable image size), the optimum size for today's demanding applications, at the incredible price of only $799.*

Now this is clearly good news for you. And your CFO. But most importantly, perhaps, for the person who will sit in front of them all day.

You see, our XV Series of monitors, like all MultiSync monitors, are truly designed for the eyes. The eyes of an overworked administrator, a slightly frenzied manager, a number-crunching analyst.

These eyes demand sharp detail, bright colors, and crystal-clear images. Which is precisely what these MultiSync monitors deliver.

MultiSync® XV17™
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(15.6" viewable image size)
Max. Res: 1280 x 1024 NI at 60 Hz**

MultiSync® XV15™
$480 ESP
15" Flat Square Technology CRT
(13.8" viewable image size)
Max. Res: 1280 x 1024 NI at 60 Hz**

MultiSync® XV14™
$330 ESP
14" Non-Glare CRT
(13.0" viewable image size)
Max. Res: 1024 x 768 NI at 70 Hz

For example, they're built with NEC's exclusive FullScan™ capability for images that are sharp and focused all the way to the edges and in the corners.

The MultiSync XV Series also delivers the legendary quality and reliability you expect from NEC, backed by a three-year limited warranty which is one of the best in the industry. Plus, the XV Series is ideal for both PC and Macintosh® systems and offers Microsoft® Plug and Play compatibility.

Designed for Microsoft Windows 95

*Estimated selling price. **Maximum resolution

See, Hear and Feel The Difference, FastFacts, XV17, XV15, XV14, AudioPower and FullScan are trademarks and MultiSync is a registered trademark of NEC

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GREETING CARD

PC WORLD

Cover Story

129 Editor's Choice: 75 Best CDs

This holiday season there's a title for everyone on your list. Among the most beguiling stocking stuffers: incredible billiards simulation in Virtual Pool, a breathtaking tour of the French museum in Le Louvre, an exhaustive reference library in Britannica CD, whimsical creatures in Dr. Seuss's ABCs, and exploration of an enigmatic land in Passage to Vietnam.

Special Report: Small Office, Home Office

198 Top Tips for the Bottom Line

The best ways to tackle small office accounting.

207 Getting Paid

Proven collection strategies for small business owners.

215 Hot Picks for the Home Office

A few of our favorite things, including a home office voice-mail system and a combination printer/fax/scanner/phone.

Cover Photography by Robert Cardin

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150 Microsoft Office 95: Who Needs It?

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Telecommuting Tips

170 Commuting Meets Computing

Telecommuting has taken off! We explore tactics to get employees and management to buy in, and the basics of a well-equipped telecommuter's office.

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Working at home, or on the road? We review six Windows remote access packages that let you get to your office PC, no matter where you are.

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70 Window 95: The First 30 Days

Users lined up at midnight at CompUSA, waited 45 minutes for tech support—and sometimes uninstalled Win 95.

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82 From Apple to Zeos: Rating Today's PCs

Some 19,700 readers rate the best and worst in PC service and reliability.

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Plug and Play

234 Troubleshooting Tips: When Plug and Play Won't Work
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Beyond great performance, we also protect your investment. To ensure that your new ZEOS Pantera will serve you well for years to come, we build in more reliability, expandability and upgradability than anyone else.

For starters, all Pantera systems provide you with CPU upgradability to a future OverDrive® Processor. You also get *six* memory sockets instead of the usual four. That means more room to grow—without having to throw away perfectly good memory when it's time to upgrade. Panteras also include on-board PCI local bus SCSI and Ethernet options and the power to run all these goodies. Believe it or not, most companies are now building in small power supplies of 150 watts or less! That's great for reducing *their* costs, but it sure doesn't do much for *you*. Pantera power supplies are 200 watts *standard* and they're energy efficient—Panteras are EPA Energy Star compliant, meaning they can power down and use less energy.

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In addition to the latest features, you need your new system to arrive promptly and you need it to work in *your* environment when you get it. That is why ZEOS Pantera systems include your choice of Windows® for Workgroups or the new Windows® 95, and that is why you also get compatibility with every major operating system on the market including Win NT®, Netware®, Unix® and OS/2®. That is also why we pioneered our *Computers Now*® program—many of our most popular configurations can be shipped the *very day you order* (even custom-built systems can be shipped in about a week). You could be taking delivery of your new Pantera tomorrow!

And after your purchase, we'll be here. ZEOS was the first to provide 24 hour-per-day, 365 day-per-year toll-free technical assistance, and it's the best there is. Add to that our easy accessibility through the major on-line services and through our automated fax-back system, and you can see that we support you like no one else.

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The hottest performance for today and for tomorrow, compatibility, reliability, bundled software, the best service in the industry and incredible prices that'll leave you amazed at how much you get for so little. As *PC/Computing* said, the Pantera "... is a deal you simply can't pass up." So call your ZEOS Systems Consultant now at 800-554-5220. It's the best purchase decision you'll ever make.

* Not all configurations may be certified. Call ZEOS for additional details.

PC Magazine Editors' Choice — Pentium-66 April 12, 1994; DX4-100 June 28, 1994

Computer Shopper — Pentium-60 April 1994; Pentium-90 August 1994

PC World Best Buy — 486DX2-66 January 1994, February 1994, March 1994, June 1994, December 1994, January 1995, February 1995, March 1995, April 1995; DX4-100 October 1994, November 1994, December 1994; Pentium-60 December 1994, January 1995, February 1995, April 1995; Pentium-66 June 1994, July 1994, August 1994, September 1994; Pentium-90 August 1994, September 1994, October 1994, November 1994, January 1995, February 1995

PC Best — Pentium-66 May 1994; Pentium-90 February 1995

Windows Sources Experts' Pick — Pentium-66 June 1994; Pentium-90 August 1994

Windows Magazine Recommends 1994 — Pentium-90 November 1994

Windows 1995 Win 100 — Pentium-90 May 1995

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90MHz	$1795	90MHz	$2395	90MHz	CN! $2795	90MHz	$3295
100MHz	$1945	100MHz	$2545	100MHz	$2945	100MHz	CN! $3445
120MHz	$2145	120MHz	$2745	120MHz	$3145	120MHz	CN! $3645
133MHz	$2295	133MHz	$2895	133MHz	$3295	133MHz	$3795
➤ 8MB EDO RAM		➤ 16MB EDO RAM		➤ 24MB EDO RAM		➤ 32MB EDO RAM	
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➤ 3.5" 1.44MB floppy disk drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive		➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive	
➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM		➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 1MB DRAM	
➤ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dot pitch		➤ **ZEOS 15"** 1024 x 768 NI SVGA color monitor, .28mm dot pitch		➤ **ZEOS 15"** 1024 x 768 NI SVGA color monitor, .28mm dot pitch		➤ **ZEOS 15"** 1024 x 768 NI SVGA color monitor, .28mm dot pitch	
➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans		➤ Six-bay desktop case with two cooling fans	
➤ Microsoft Mouse		➤ Microsoft Mouse		➤ Microsoft Mouse		➤ Microsoft Mouse	
➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11		➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11		➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11		➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11	
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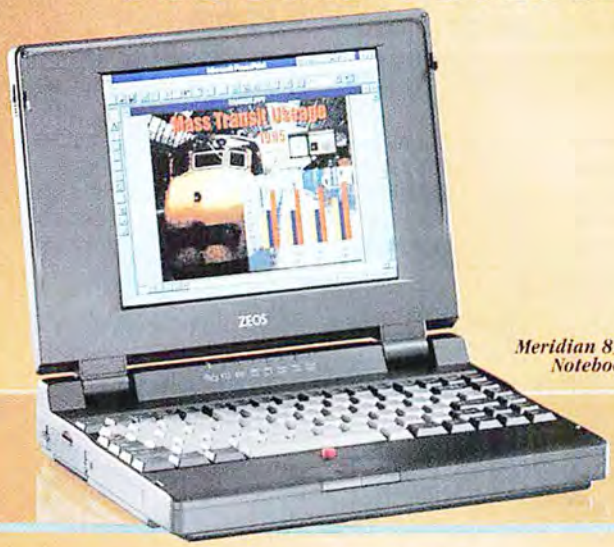
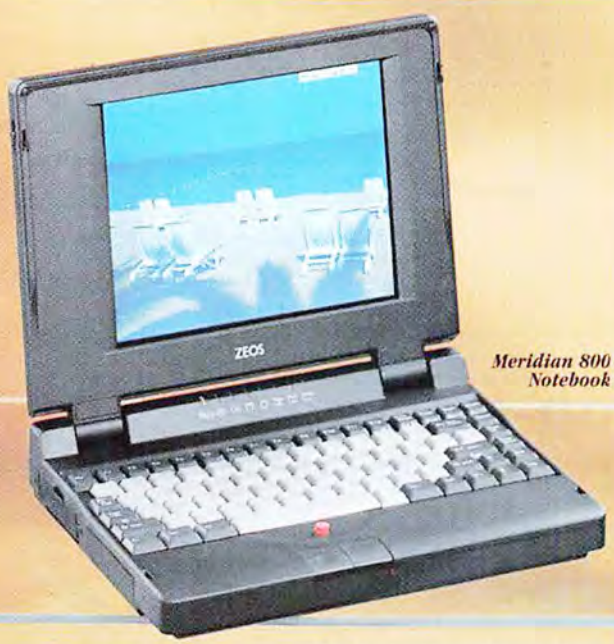


Meridian 850 Notebook

Meridian 400 Subnotebook



Meridian 800 Notebook

Meridians with unretouched photo of active matrix displays.

Your First-Class Travel Companion.

Wherever you happen to go—the office, home, or a trip for business or pleasure—take along a ZEOS Meridian notebook. You get three exceptional systems to choose from. Each is a leader in its category, ready to give you the power, performance, and mobility that you could only dream of until now.

While each Meridian product is distinct, they all have several intelligent features that set them apart. All include local bus video; an 84-key keyboard with a comfortable palm rest and integrated TruePoint™ pointing device; and the most solid construction available.

Meridian 400 Subnotebook

WINDOWS 1995 WIN 100 May 1995

"ZEOS is out to prove that good things do come in small packages with its Meridian 400C subnotebook," reported *Windows Magazine*.

At 3.9 pounds, the Meridian 400 is molded with a special carbon-fiber material that cuts weight and improves durability. And with a DX4-100MHz processor *standard*, it may well be the highest performance subnotebook available; "faster than a speeding desktop" is how *Computer Shopper* described it.

In addition to great performance, you also get hard drives to 350MB, RAM that's user upgradable to 20MB, two Type II PCMCIA slots, an external ultra-light 3.5" 1.44MB floppy drive (included in Packages 2 and 3) and your choice of active matrix or dual scan color screens. Amazing!

Meridian 800 Notebook

WINDOWS 1995 WIN 100 May 1995

"The 800C notebook offers sleek styling, solid construction and hot performance....one of the fastest notebooks we've ever tested," said *Windows Magazine*.

At 6.3 pounds, the Meridian 800 full-size notebook is light enough to travel anywhere yet, with its whopping 10.3" dual scan or 9.5" active matrix color display, is large enough to use for presentations and everyday computing.

To complete the package, you also get a DX4-100MHz CPU, up to 20MB of user-upgradable RAM, a removable hard drive to 528MB, a built-in 3.5" 1.44MB floppy drive and PCMCIA slots supporting two Type II or one Type III devices. Full desktop features that fit in your briefcase!

Meridian 850 Notebook

"On our Graphics Winmark 95 tests...ZEOS's Meridian 850C grabbed the top position. The ZEOS 850C again finished first on our Disk Winmark 95 tests," reported *PC Magazine*.

Imagine, today's most advance computing capabilities wrapped up in a 6.8 pound package. With features including your choice of Pentium® processors, a 256K synchronous SRAM cache, user-upgradable memory to 32MB, removable hard drives to 1.3GB, PCMCIA support for two Type II or one Type III devices

and a built-in 3.5" 1.44MB floppy drive, this is the notebook computer that rivals today's most advanced desktops!

With its blazing speed, your choice of a 10.3" SVGA (800 x 600) dual scan color display or 9.5" VGA active matrix color display *and* 16-bit Sound Blaster® compatible sound through audio jacks, your Meridian 850 is also a traveling multimedia center!

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No matter which Meridian notebook you purchase, you get the best service and support in the business! ZEOS has won seven *PC Magazine* Readers' Choice for Service & Reliability awards. And, ZEOS was the first to provide 24-hour toll-free technical support.

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Package 1			Package 2			Package 3		
	400C	800C		400C	800C		400C	800C
DX4-100	$1695	$2295	DX4-100	$1995	$2495	DX4-100	CN! $2295	CN! $2795
➤ 4MB RAM ➤ 260MB IDE hard drive ➤ 800: Internal 3.5" 1.44MB floppy drive ➤ MS-DOS 6.2 & Windows for Workgroups 3.11 ➤ MS Works			➤ 8MB RAM ➤ 350MB IDE hard drive ➤ 3.5" 1.44MB floppy drive. 400: External, 800: Internal ➤ Custom nylon carrying case ➤ **MS Windows® 95** or MS-DOS 6.2 & Windows for Workgroups 3.11 ➤ **MS Works 95** or MS Works			➤ 8MB RAM ➤ IDE hard drive. 400: 350MB, 800: 528MB ➤ 3.5" 1.44MB floppy drive. 400: External, 800: Internal ➤ **14.4 PCMCIA fax/modem** ➤ Custom carrying case. 400: Leather, 800: Nylon ➤ Extra battery ➤ **MS Windows 95** or MS-DOS 6.2 & Windows for Workgroups 3.11 ➤ **MS Works 95** or MS Works		
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90MHz	$3295		90MHz	$3795		90MHz	CN! $4195	
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Prices shown include dual scan color display.
Upgrade to *ACTIVE* color display! Meridian 400 add only $700. Meridian 800 or 850 add only $800.

Included With Every ZEOS Meridian:

intel inside pentium PROCESSOR

- ➤ 400 & 800: Intel® DX4-100 processor. 850: Intel® Pentium processor, 75MHz or 90MHz.
- ➤ 400 & 800: RAM expandable to 20MB. 850: RAM expandable to 32MB.
- ➤ IDE upgradable HDD. 400: to 350MB, 800: to 528MB, 850: to **1.3GB**.
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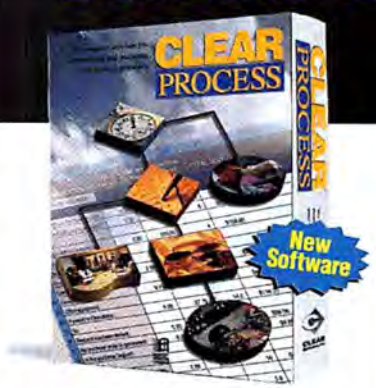

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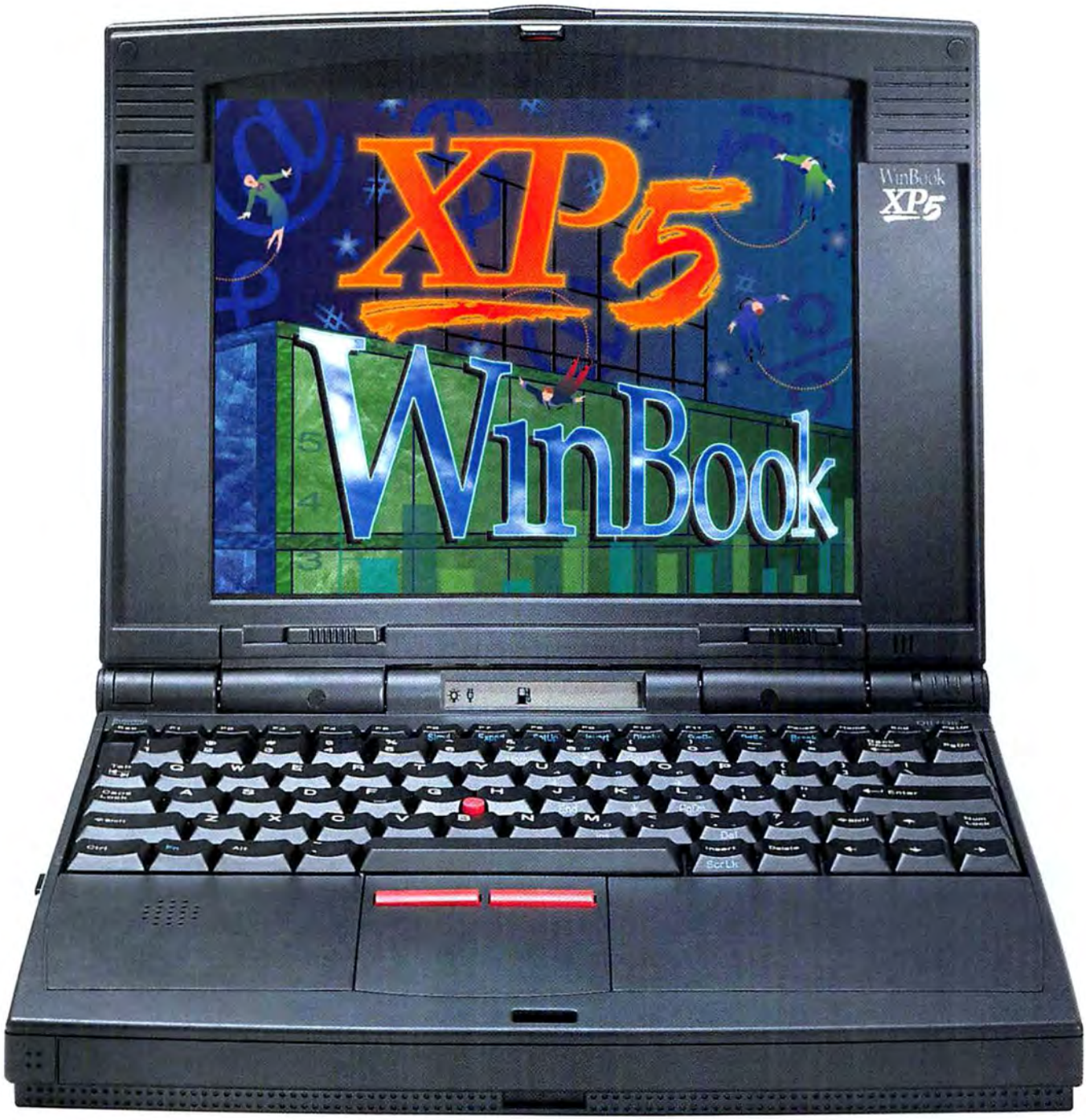

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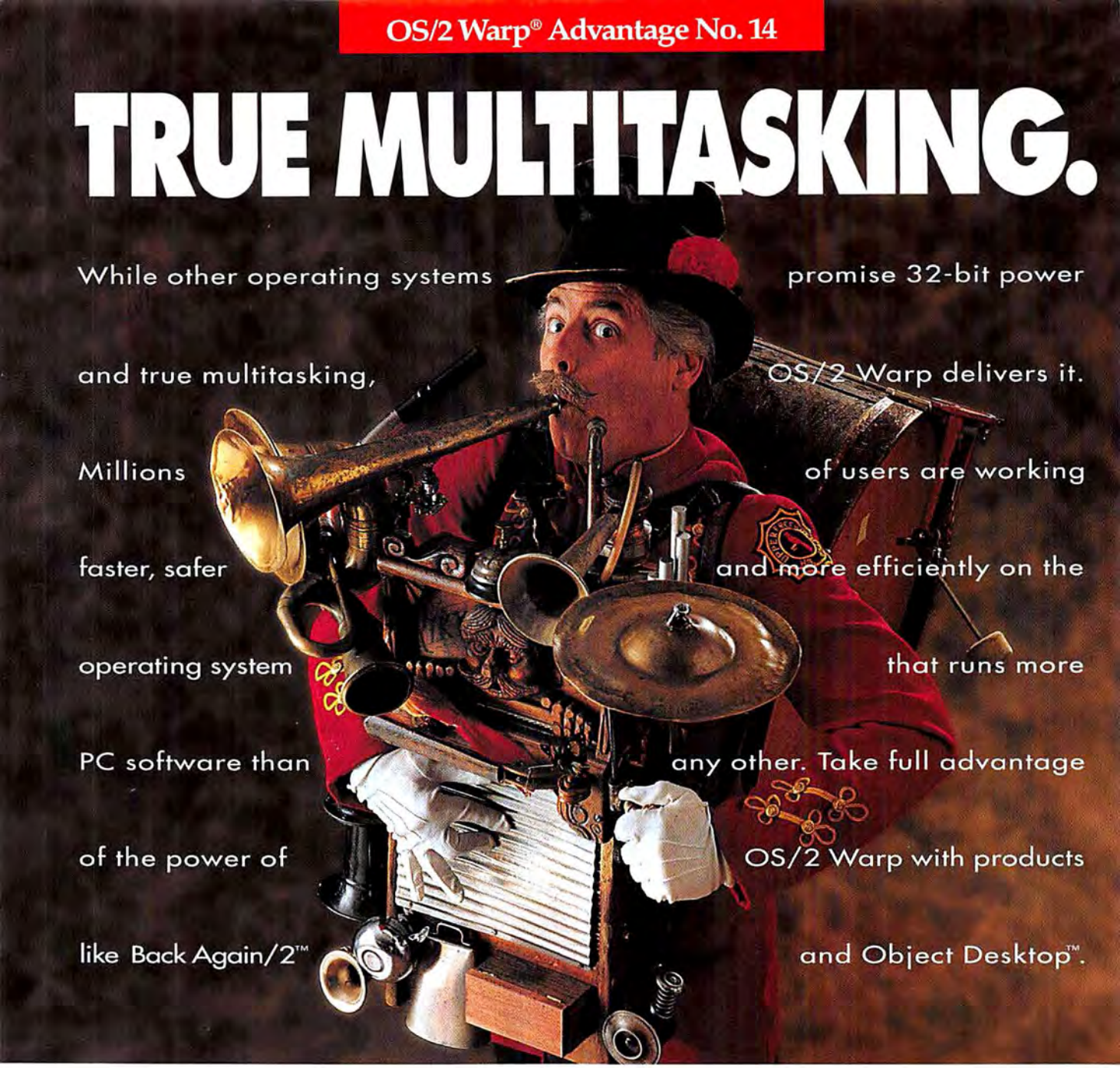

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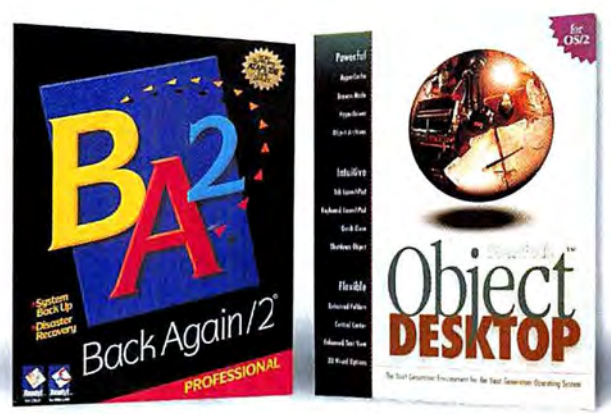

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The Odd Couple: The Pentium Pro and Windows 95

For a decade and a half, Intel and Microsoft have defined the PC, each forming one leg of a colossus astride personal computing. Each new Intel microprocessor has given existing Microsoft operating systems new kick, and each new Microsoft operating system has used the latest steps in Intel's newest chip. But when Intel's new Pentium Pro (formerly known as the P6) and Microsoft's Windows 95 march forth together, the colossus stumbles, one toe tripping on the other leg's heel.

This isn't to say that either Windows 95 or the Pentium Pro has a fatal flaw. Windows 95 embodies shrewd, deliberate sacrifices of pure 32-bit performance for efficient backward compatibility. The Pentium Pro goes all out to accelerate pure 32-bit software, which surely represents the future. The Pentium Pro runs 16-bit software, including old applications and the 16-bit parts of Windows 95, but not with the performance boost expected from a new Intel processor. Unfortunately, 32-bit software like Windows NT requires a more expensive PC, has fewer applications and drivers required for peripherals, lacks Plug and Play, and labors under the old Windows look and feel.

The Few, the Proud, the Pentium Pro

In short, Windows NT and the Pentium Pro may be made for each other, but in 1996 they aren't likely to be appealing choices for desktop PC users except those whose specialized apps demand industrial-strength security or gargantuan calculations. Most of the PC-using public won't pay $1000 extra for the Pentium Pro until versions appear that boost Windows 95 performance well beyond Pentium levels.

Intel's challenge will be to avoid embarrassment when 150-MHz Pentiums run Windows 95 better than the Pentium Pro does. Besides higher clock speeds, 1996 is likely to bring new versions of the Pentium and new support chips that let the Pentium Pro do more of its stuff. Note that if the Pentium Pro isn't for you, Intel is still trying to ensure that your next most likely choices come from Intel as well.

If anyone else has a real chance to power your next PC during this awkward period between the Pentium Pro and Windows 95, it's Cyrix. Last month our tests placed the company's 100-MHz 6x86 in the same class as a 133-MHz Pentium, with no penalty apparent for 16-bit software. For Cyrix, the challenges will be attaining higher clock speeds and selling enough of the 6x86 to make a perceptible dent in Intel's market share. But IBM holds the key.

IBM manufactures the 6x86 for Cyrix and has the right to make a 6x86 for its own purposes each time it makes a 6x86 for Cyrix. Suspicion abounds that IBM will allocate its manufacturing capacity to the Power PC at the expense of the 6x86, although a little arithmetic seems to indicate such a decision would be foolish. If IBM produces 2 million Pentium systems in the next year and pays Intel $400 for each Pentium chip inside, $800 million will flow from IBM to Intel. Substituting the very competitive 6x86 in the same number of PCs might increase IBM profits by half or more of the $800 million. But what's a few hundred million compared to the challenge of ever so slowly converting infidels to the one true church, the Power PC? Cyrix has hedged against IBM's ambivalence by investing in its own production line inside an IBM semiconductor plant.

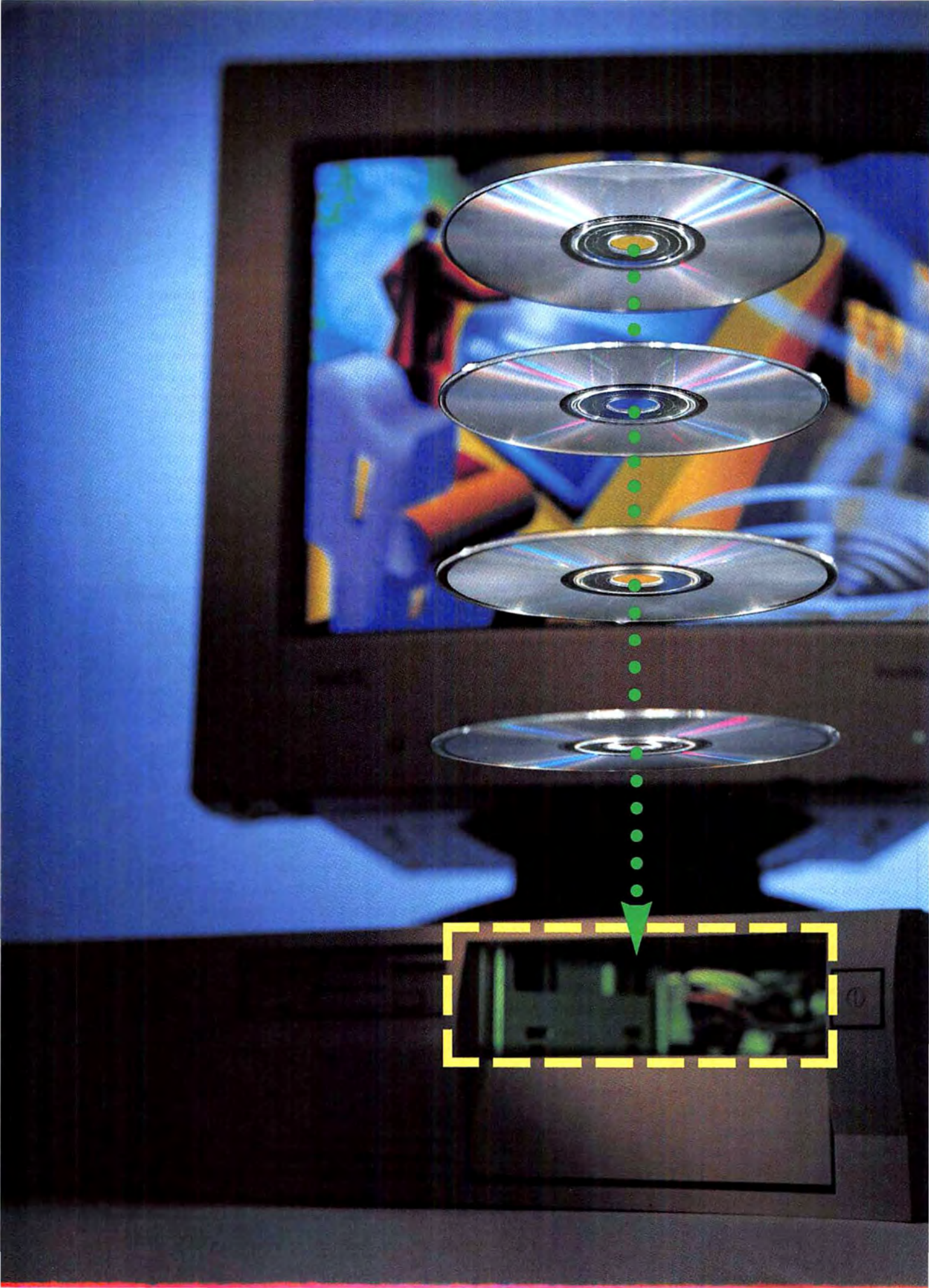
For the same 15 years that Microsoft and Intel have ruled, a home PC has been an office PC trucked home. These big, boxy chunks of corporate America have been too useful and entertaining to exclude from domestic life but no more welcome in living areas than a cat who shreds upholstery. PC manufacturers, long distracted by booming sales, are finally realizing that the home requires a different PC. "Family Values" is James A. Martin's account of how six families cuddled up at our request with the Acer Aspire, Digital Starion, Hewlett-Packard Pavilion, NEC Ready, and Packard Bell Legend. Part family feud and part consumer psychology, Martin's article sheds new light on the quest for a home PC worthy of the name.

Intel's challenge will be to avoid embarrassment when its 150-MHz Pentiums run Windows 95 better than the Pentium Pro does.

If you've been wondering whether a handheld computer might supplement your desktop or notebook, take a look at *Newton World* (following page 318), which explores the latest incarnation of Apple's pioneering personal digital assistant. Edited by Bronwyn Fryer independently of *PC World* as well as Apple Computer, *Newton World*, like its namesake, marches to its own beat as it provides insight into where this intriguing technology is finding uses.

Phil Lemmons

Phil Lemmons, Editor in Chief



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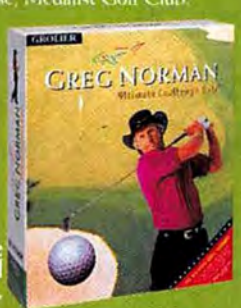

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Circle 99 on reader service card

Learning to Live With It

Cram Session

Your coverage of Windows 95 has been excellent ["First Look: New Software for Windows 95," October]. I didn't get the new operating system until recently, so I wasn't reading all the articles until now. Now that I have it, I'm going back and reading them. They are all so informative, I end up reading the magazines from cover to cover. Keep up the great work.
Todd Myra, via CompuServe

What Did You Expect?

I can't tell you how annoying it is hearing all the Windows 95 bashing. I viewed Windows 95 as a bridge between the current 16-bit DOS-based world and the eventual dominance of an NT workstation-style platform. I don't know what people expected. My only expectation was that it be a lot better than Windows for Workgroups. By doing that I didn't set myself up for a letdown since Windows 95 is most certainly a huge jump ahead from what we had been using. So just calm down and live with it.
Erik Jackson, Merchantville, New Jersey

Pricing Paradox

I would first like to compliment you on your Top 20 articles. A consistent, quick comparison chart is a great service to readers, and the information is fairly thorough, given the space constraints you undoubtedly deal with.

However, I do have a complaint about one aspect of the charts. When prices are continuously changing, how can you list a system with a price that's two to six months out of date? It will always skew the overall score toward the most recently reviewed system, all else being equal. I therefore tend to discount the Overall Rating since it's based in no small part on incorrect information. I'm sure I am not the only reader who also sees at least the appearance of incomplete reporting when you list a system price that an advertisement in the same issue gives as hundreds of dollars cheaper.

I would consider it a much better service if you could at least call the vendors for price updates or check with your advertising department for prices in the ads (though even those prices are frequently out of date by the time they're published) and list the current prices with recalibrated Overall Ratings.
Rick Johnston, Nashua, New Hampshire

Editor's response: We reprice all the items on our Top 20 list up to the date listed on our Features Comparison—even products we've reviewed in the past. And we update configurations if, say, a hard drive size changes or a CD-ROM drive is added. If major parts that affect performance are changed, we do another complete review.

These prices are collected several weeks before the magazine comes out because it takes time to edit, print, and distribute the magazine. Ad pages come in well after editorial pages, and vendors can project advertised prices. But we have to research the actual selling prices to avoid "vapor pricing" and to keep products from getting unfairly high ratings due to overly optimistic projections from vendors. Furthermore, we adhere to the same time frame for all the systems on our Top 20s to avoid giving a few vendors with late changes an advantage. While prices may drop below what's listed on our charts, if you look closer at ads, you'll often see that there are configuration differences that make price differences appear larger than they really are. *—Rex Farrance, senior associate editor*

Entry-Level Power

I greatly enjoy reading your magazine, but "Cheap PCs: Brand Name vs. Brand X" [October] made me want to share an opinion that I have harbored for a while. The article states that an "entry-level" system should be at minimum a Pentium-75. Why? Most entry-level users, and for that matter most home users, never even touch the computing potential of a 486.

Do we need a Pentium PC to use databases, spreadsheets, word processors, and games? No! More graphics-intensive work such as presentations or CAD/CAM? Maybe, but how many of us really do these things daily? I seriously doubt that entry-level users do unless it's part of their job. Better look hard at how you define "entry level."
Nick Ostrosky, via Internet

Editor's response: We'd never advise every owner of an older PC to consign it to the trash heap. But when it comes time to invest in a new computer, it makes good sense to buy one that runs current applications well—and that won't be rendered instantly obsolete

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by future software. Popular applications ranging from multimedia CD-ROMs to World Wide Web browsers can push even a Pentium processor to its limits; that's why we recommend a multimedia-equipped Pentium-75 PC as a sensible entry-level purchase. —*Harry McCracken, senior associate editor*

The Cutting Edge of Bashing

I am really amused by the comments of those who bash Windows 95 in the Letters section of *PC World* [September and October] and other computer publications. Six months ago it was the "in" thing to bash Windows 3.1 and Windows for Workgroups 3.11. "What an unstable, resource-hogging mess" was a recurring theme in those letters. Now I see that people are writing similar things about Windows 95 and saying how happy they are that they've stayed with their old, reliable standard, Windows 3.1 or 3.11. Seems like sometimes you just can't win!

Personally, I've made the change and I think I've made a great jump forward with Windows 95. There is a learning curve, as with any new, complex program, but I can see it's worth the time it's taking. I am glad to see *PC World*'s fair coverage, good and bad, of Windows 95.

Joe Russo, via Internet

Remembering the Rest

Just wanted to compliment you on not ignoring those of us who are *not* caught up in Windows 95. I am sure that I am not the only reader who values information that I can use in dealing with my computer and Windows for Workgroups 3.11. Keep up the good work.

Charles M. Chayes, via America Online

You've Gotta Have It

I can hardly wait. Your next issue will surely have a cover that shouts, "Windows 95: Why You Absolutely Have to Have It." You've done it before. Your May 1993 issue carried the title "DOS 6: Why You Have to Have It." You foisted DOS 6 on your readers at an early date, only to discover that the operating system was prematurely released. We had to wait for DOS 6.22 to solve that problem.

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Circle 9 on reader service card

Now you're going to do it again. I don't "have to have" Windows 95. It won't run on my 386 computer, and I wouldn't buy it at this early date even if it did. Your magazine gives every indication of becoming a slave to Windows 95. If that happens, you'll be abandoning a huge group of users doing productive work with their 386s (and another group still using 286s).

This much is certain: If *PC World* goes hog-wild on Windows 95, I don't "have to have" *PC World*. I'll spend my money on another publication.

Robert T. Harnett, Kettering, Ohio

A New Deck to Shuffle

I just received your September issue in the mail today. I found six subscription cards in there. Why six? Isn't one enough? Are subscribers paying for excess printing? We shouldn't have to. I enjoy your magazine, especially the tips section in the back. Let's keep the magazine cleaned up, huh?

Ron Nolan, via CompuServe

Senior vice president's response: Insert cards are an important source of subscribers for *PC World*, bringing in thousands of new subscribers with each issue. Subscribers do not pay for excess printing of insert cards; in fact, *PC World* has not raised its basic annual subscription price since 1993. But one thing has changed: Since 1994, *PC World*'s insert cards have been printed on recycled paper. —*Heather Martin Maier*

Online Banking Gets Whacked

"Personal Finance Gets Wired" [September] had a good discussion of online banking, but it overemphasized the "fear of technology," while downplaying the real consumer holdback: For most of us, banking is not a major issue in our lives. Even if it were, online banking is neither a cost- nor time-effective solution.

Maybe I'm a financial ignoramus, but what is all this "banking" everyone you quoted seems to have trouble finding time for? Like Debra Ferraro in the article, I never go into a bank, except to deposit cash. A few times a month I pay bills. If I need to move money or manage investments—another issue entirely—I can do it by check or phone. Other than reconciling the checkbook, where's the problem?

I know that by reducing my checking account balance, using multiple banks, and moving money around electronically, I could eke out a few more dollars in interest. Busy, affluent people who complain that they have no time, and then spend hours micromanaging their finances to make an extra five bucks a month, need a whack on the head with the Looney Toons hammer.

Finally, there are the fees, such as Intuit's $10 per month. No, Ms. Denny (of B/R/S Group) and Mr. Dunn (of Intuit), there's nothing sacred about "putting a check in an envelope," and it doesn't "take a leap of faith [to] throw away the invoice"—it's the ten bucks a month!

As long as most online services are available through conventional sources for less money and comparable convenience, online banking will remain, from the customer's point of view, a solution looking for a problem.

John Slowata, Far Hills, New Jersey

Corrections and Clarifications

On page 136 of our October issue, we listed an incorrect FTP site address for Hewlett-Packard's Colorado Memory Systems Division. The correct address is **ftp://col.hp.com/dist/hp-colorado.**

"Gold Rush on the Electronic Frontier" (October) provided an erroneous Web site address for Web Communications. The correct address is **http://www.webcom.com.**

October's "First Look: New Software for Windows 95" stated that among the features previously missing from the DeScribe word processor were endnotes, unlimited undos, and a capable macro language. These features in fact have been included in earlier versions of the product, the company says.

PC World regrets the errors.

Letters *welcomes your responses and ideas.* *See page 12 for contact information.*

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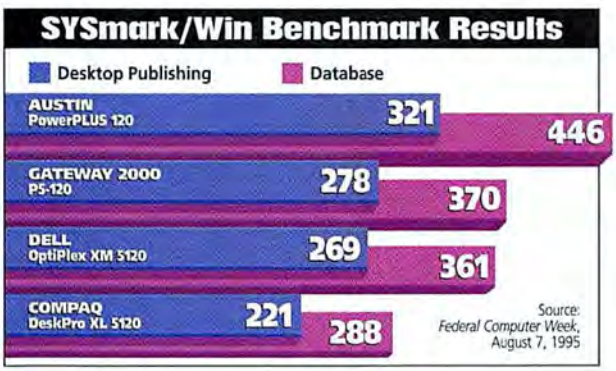

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COMDEX BOOTH L402 FALL 1995

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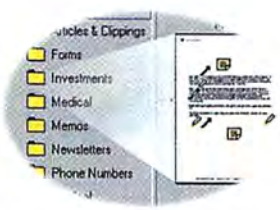

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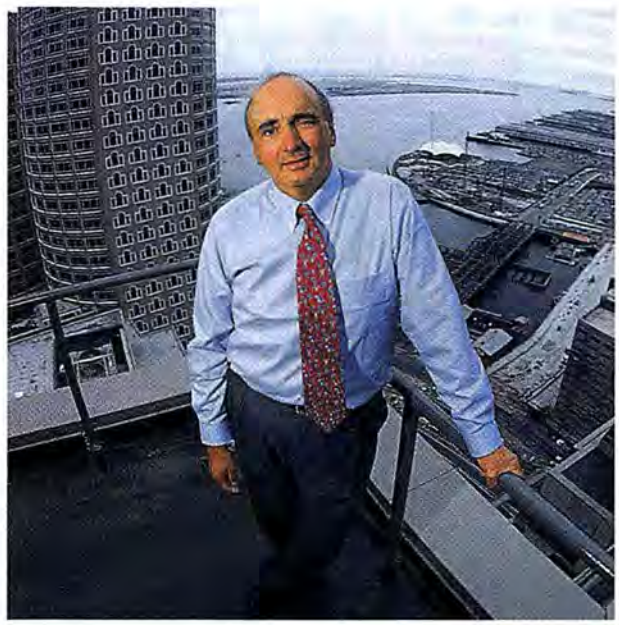
Circle 187 on reader service card

Information at Your Belt Buckle

When you need to send a critical message, meet a deadline, or communicate urgent information to people scattered across town or around the country, you probably get on the horn or send e-mail. That's fine if you don't mind listening to that frustrating voice-mail greeting ("I'm on the phone or away from my desk") or sitting tight and waiting for your recipient to check e-mail. Meanwhile, the clock ticks.

This month Peter Johnson, senior vice president for Boston-based Spaulding & Slye, an integrated construction and real estate services firm, describes how his company hooked everyday pagers into its existing groupware to take message delivery to the next level. *—Editor*



Peter Johnson is a senior VP at Spaulding & Slye, a Boston real estate corporation.

Beyond the Leading Edge

When you have a diverse team of people who have to communicate and manage projects, keeping in constant touch can be a tricky business. Even when faxes, voice mail, and modems make it possible to send information quickly, it's tough to make sure that everyone is in sync.

As an executive for a 29-year-old, 300-employee commercial real estate corporation serving Fortune 100 companies, I know how hard it is to coordinate projects and people. Our greatest challenge is consolidating and communicating thousands of architectural plans, permits, forms, memos, photos, abstracts, and meeting notes to architects, site managers, project managers, and others at 19 offices and construction sites around the world.

Our company, which has always tried to be on the leading edge of technology, began to address this problem two years ago, when we installed Lotus Notes on our Banyan VINES network. The idea was to put everything relating to our properties into Notes databases, so that we could create a "paperless" project for a large corporate client.

Notes is a handy repository for inputting, updating, tracking, and sharing information. Today, if an architect in Boston is working on a project with a field engineer in Atlanta, it's easy for the architect to make a change to a building plan, scan it into a PC using a desktop scanner, and store the sketch in a Notes database, where the field engineer can easily access it.

While Notes solved our information storage and sharing problems, it didn't take care of one thing: immediacy. Important clients, for whom we were working on new headquarters or other important buildings, were anxious to know what was going on with a project, sometimes on a minute-by-minute basis. And within our firm, mobile executives like me—who were running projects in Massachusetts; San Diego; San Juan, Puerto Rico; and Atlanta—needed to be able to provide instant project information and status reports to these clients. But how could we ask an engineer who was standing on steel girders several stories up to transmit real-time messages to the rest of us?

Who You Gonna Call?

Cellular phones and beepers didn't quite solve our problems. They can't guarantee a connection. We needed something more immediate. We discovered a good solution when SkyTel, the pager company, developed software that allows a pager to connect to Lotus Notes through a special gateway.

The pager/Notes combination works like this: While they're working on a major project, all the project leaders—architects, contractors, client representatives, engineers, and field superintendents—are provided SkyTel alphanumeric pagers. A Notes database is linked to a user directory and then connects to the pager gateway. Whenever a milestone is reached or an important event occurs, the database dials up the SkyTel network and sends a message to all team members. They can read the status report on the pager's LED display.

These wireless text messages reach SkyTel users within a minute. This kind of speed may seem like overkill, but it once helped us avert disaster. As a construction team was driving piles for a downtown office building across the street from a shopping mall, a pin broke on a 100-ton, five-story-high pile driver. It began to lean, threatening to fall on the mall full of shoppers.

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Using the SkyTel pager, the site manager sent a message out to the Notes database, which immediately summoned all the key people on the project, telling them to get to the site right away. This quickly assembled group found a way to right the pile driver in a matter of minutes. If the supervisor had not used the pager, it might have taken hours to assemble the group.

Shorter Meetings

Besides relying on the pager/Notes combination for emergencies, we also use it to save time in meetings. Because team members are in constant communication, our status update meetings, which used to be 4 hours long, now take half an hour.

Our setup—seven SkyTel pagers, the Notes gateway software, and a communications board for sending faxes and messages, which altogether cost us $2500—has also made it easier to communicate with people who aren't tapped into Notes. For example, we can send faxes from our pagers through the Notes server's fax board to the chief financial officers or the operations people at our client companies.

While communications have been made smoother and simpler, we've found that one of the biggest benefits of this technology combination is the positive effect it has on our business prospects. Because few firms—particularly in the construction industry—have taken advantage of this technology, our prospects are universally impressed. And when we see people who've spent their whole lives in the field suddenly realize the possibilities of the computer, we know we're on the right track.

- **Lotus Notes Pager Gateway for SkyTel**
  $995; prices for pager service vary; SkyTel Corp.; 800/456-3333
  Reader service no. 633
- **Lotus Notes** $275 per user (volumes of 50 or more); Lotus Development Corp.; 800/872-3387
  Reader service no. 634

Edited by Bronwyn Fryer

Bronwyn Fryer is a contributing editor for PC World. *If you use PCs to manage people and other resources in a business environment, we want to hear from you—we pay $300 for published columns. See page 12 for contact information.*

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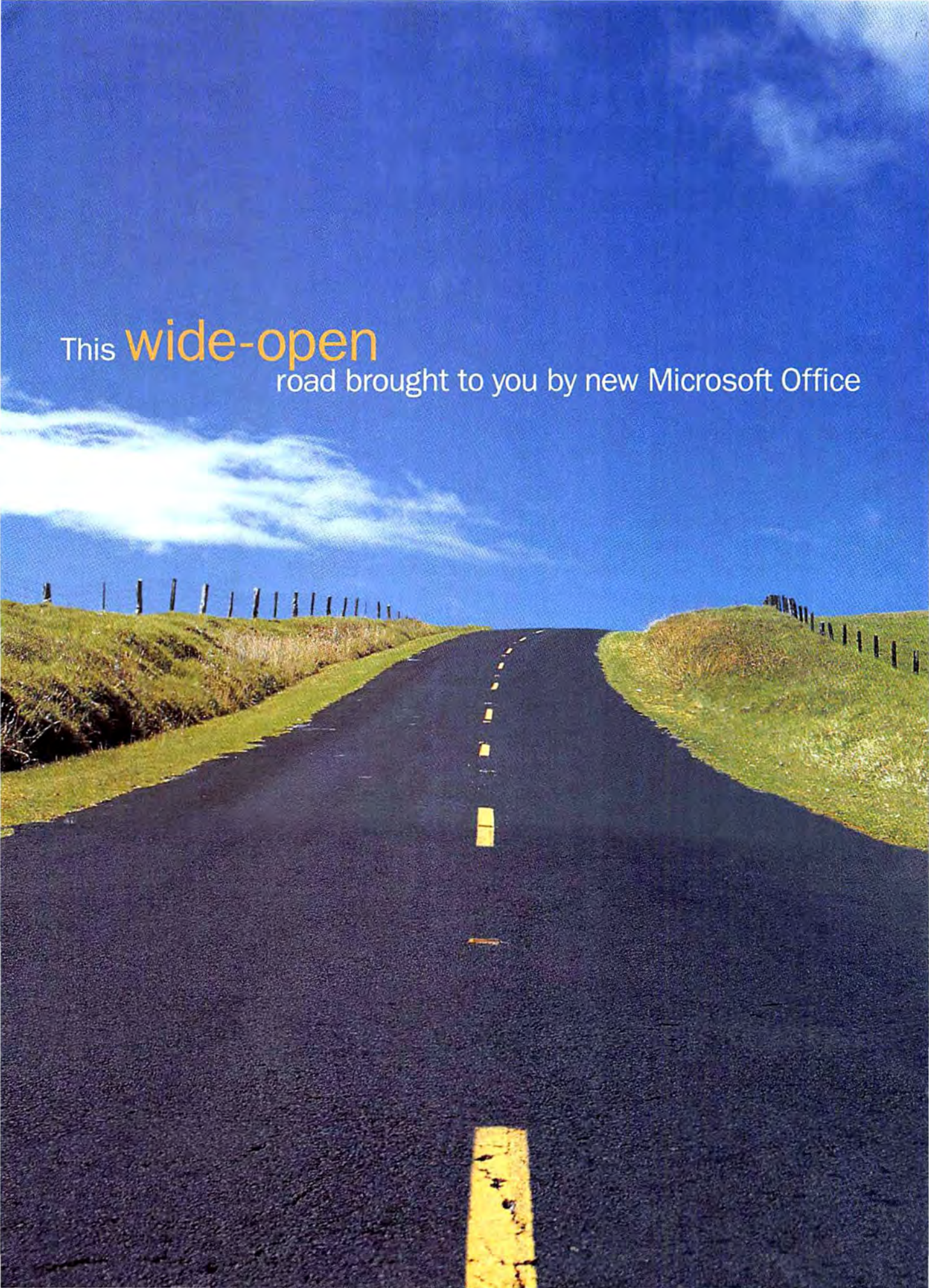
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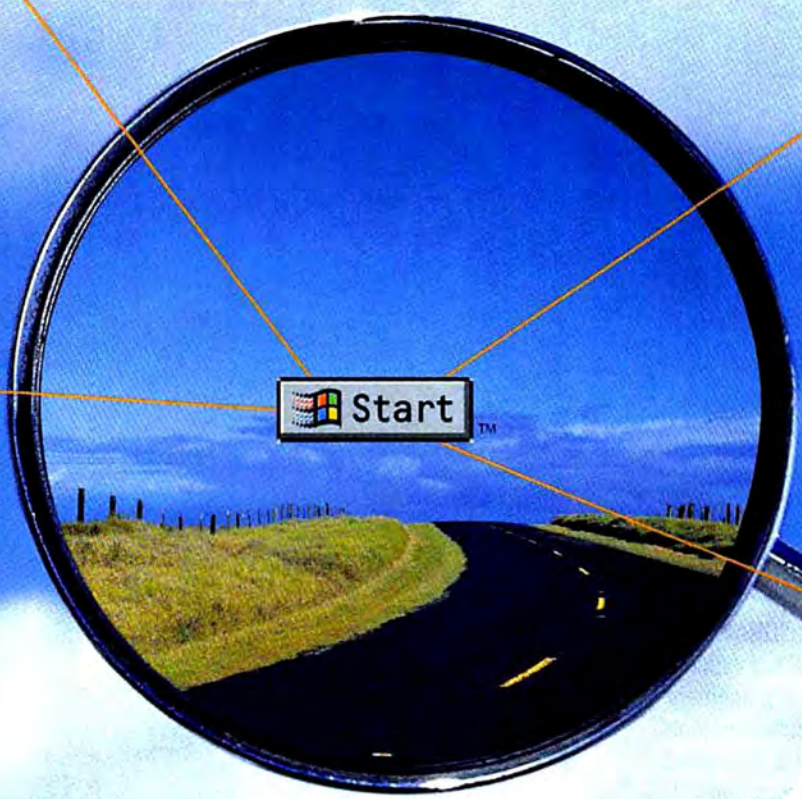

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Christmas Greetings: Watch Out for Humbugs!

The Yuletide cometh, that season of cheer, fellowship, and the obligatory consumer warnings. At the top of my Christmas list is a wish that we consumers didn't have to watch our wallets so carefully. The wonderful world of computers is all too often a realm of half-truths, gotchas, and outright humbugs.

Take the box for Star Trek Omnipedia, which calls the product "A Voice-Activated Guide to the Future" and bears a sticker reading "Designed for Windows 95." Crack the shrink-wrap and you get a somewhat different story. The manual admits that the voice recognition accuracy is 70 percent at best, and the manual is being very optimistic. It also reveals that Windows 95 (but not 3.1) users have to do special things like copying a .dll file from one directory to another and editing a file called omni_sp.ini to get speech recognition to run at all. In other words, the product is in no sense "designed for Windows 95." For truth in packaging, try the phrase that appears on Broderbund's Learn the Art of Magic: "Performs Under Windows 95."

The box for CardScan Plus, a business card scanner, proclaims "Automatically Scans, Reads, and Files Business Cards With No Typing!" Well, not quite—unless you're willing to accept a database full of states like "Tex.as" and companies like "ss)Ot-oiledalltS„-e)S-;:M—a-DO;-EX::ASH:;,"

Then there's the miracle of 32-bitness. Journalists who don't know a bit from an expense account have reported more than once that 32-bit code is twice as fast as 16-bit. Bah, humbug! If you believe that, try running the lethargic 32-bit Microsoft Office 95. In the real world, software only occasionally gets a speed boost from 32-bit instructions. Programmers get more speed advantages than the programs do.

Barnum Would've Loved It

How come my monitor and yours don't measure up to their claimed diagonal specifications? You're lucky if a 17-inch screen can actually show you 15½ inches. The practice of including the part of the monitor that can't display a picture is the kind of chutzpah that P. T. Barnum would have loved.

My personal bête noire is the way many manufacturers report refresh rate info for graphics cards and monitors. What you want to know is the maximum vertical refresh rate at each of the standard resolutions. To my eyes, 72 Hz is the lowest acceptable rate if you want to avoid screen flicker, and higher is better. But what you often get in the ads is a meaningless range ("60 tó 100 Hz") or no refresh information at all ("up to 1280 by 1024 resolution"). That's about as useful as the wildly inflated amplifier power ratings we got in the early days of hi-fi equipment—before the Federal Trade Commission stepped in to clean up the mess.

And then there's MPEG, likely to be a short-term source of confusion. MPEG-1 is a video compression specification capable of producing full-screen, full-motion video—a very big cut above what we've had until now. PCs can play back MPEG video with the help of hardware or even just software, but it is not yet clear what combination of the two you'll need to get acceptable results.

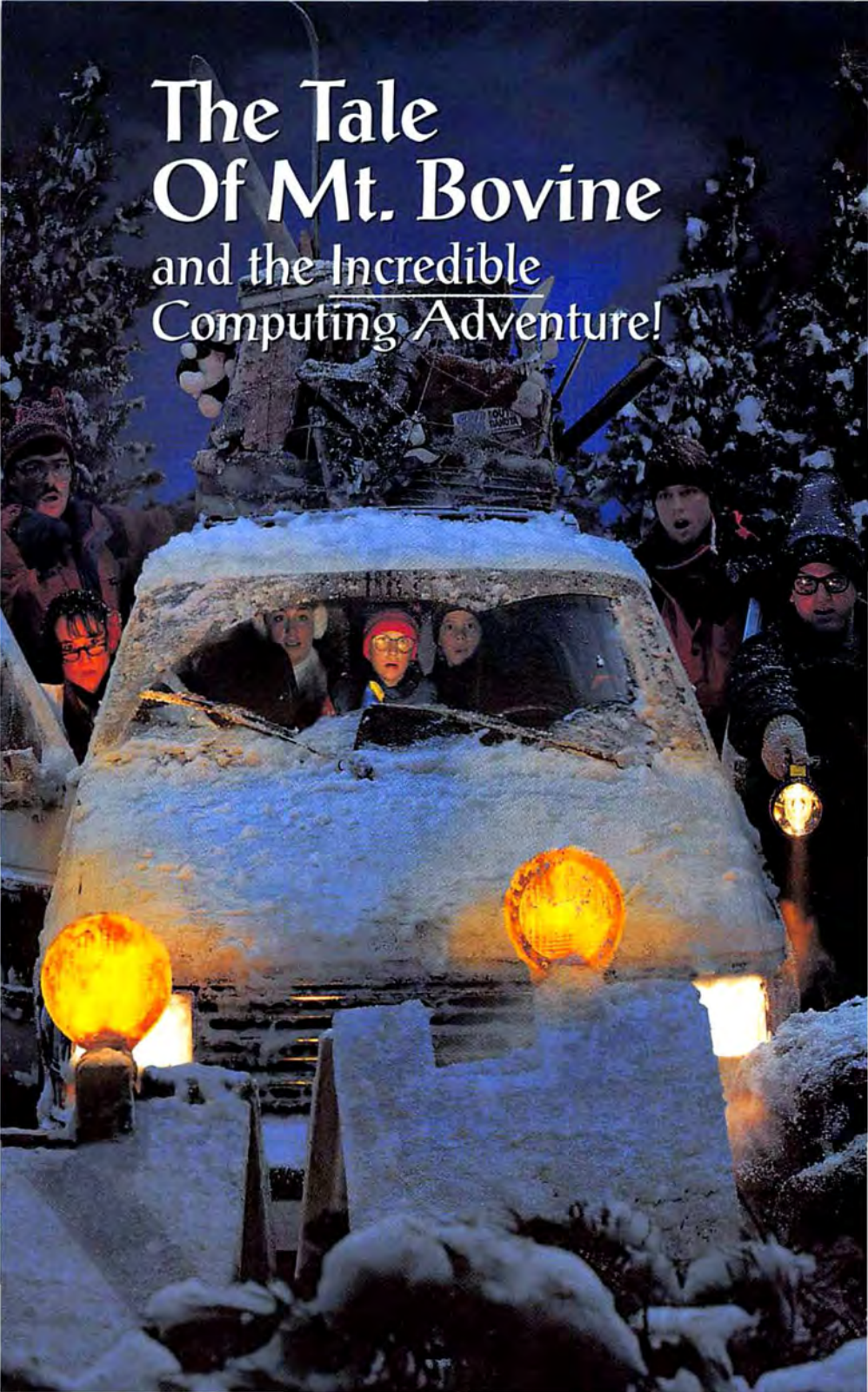
It may not matter for long anyway. Although there are plenty of MPEG-encoded titles available abroad (particularly in Japan, where CD-I players that can run MPEG movies are popular), no glut of MPEG software is on the horizon here. Besides, MPEG-1 is a rather compromised interim standard designed to work with the technical limitations of CD-ROM, and often looks worse on the up-close perfect pixels of a computer than on a more distant, blurrier TV screen, which tends to soften blocky "artifacts" of the decoding process. The much better MPEG-2 standard may deliver it a knockout blow, courtesy of DVD, the digital video disc that offers better performance and more storage than current CD-ROMs and should be available by Christmas next year. Moral: Think twice before you shell out real money for MPEG.

This Christmas you had better watch your wallets: The wonderful world of computers is too often a realm of half-truths and gotchas.

A final consumer warning. If your Christmas includes a new computer, make sure you know what setup will involve. Last year's unpleasant surprise was the hour or more of work you had to do with many machines to get your software installed, configured, and backed up before you could get your PC to do anything of interest. I hear it'll be better this year, but when it comes to corporate promises, Santa and I are inveterate skeptics.

By Stephen Manes

PC World *contributing editor Stephen Manes is a columnist for the* New York Times *and coauthor of* Gates: How Microsoft's Mogul Reinvented an Industry *(Touchstone/Simon & Schuster, 1994, 800/223-2348).*


The Tale
Of Mt. Bovine
and the Incredible
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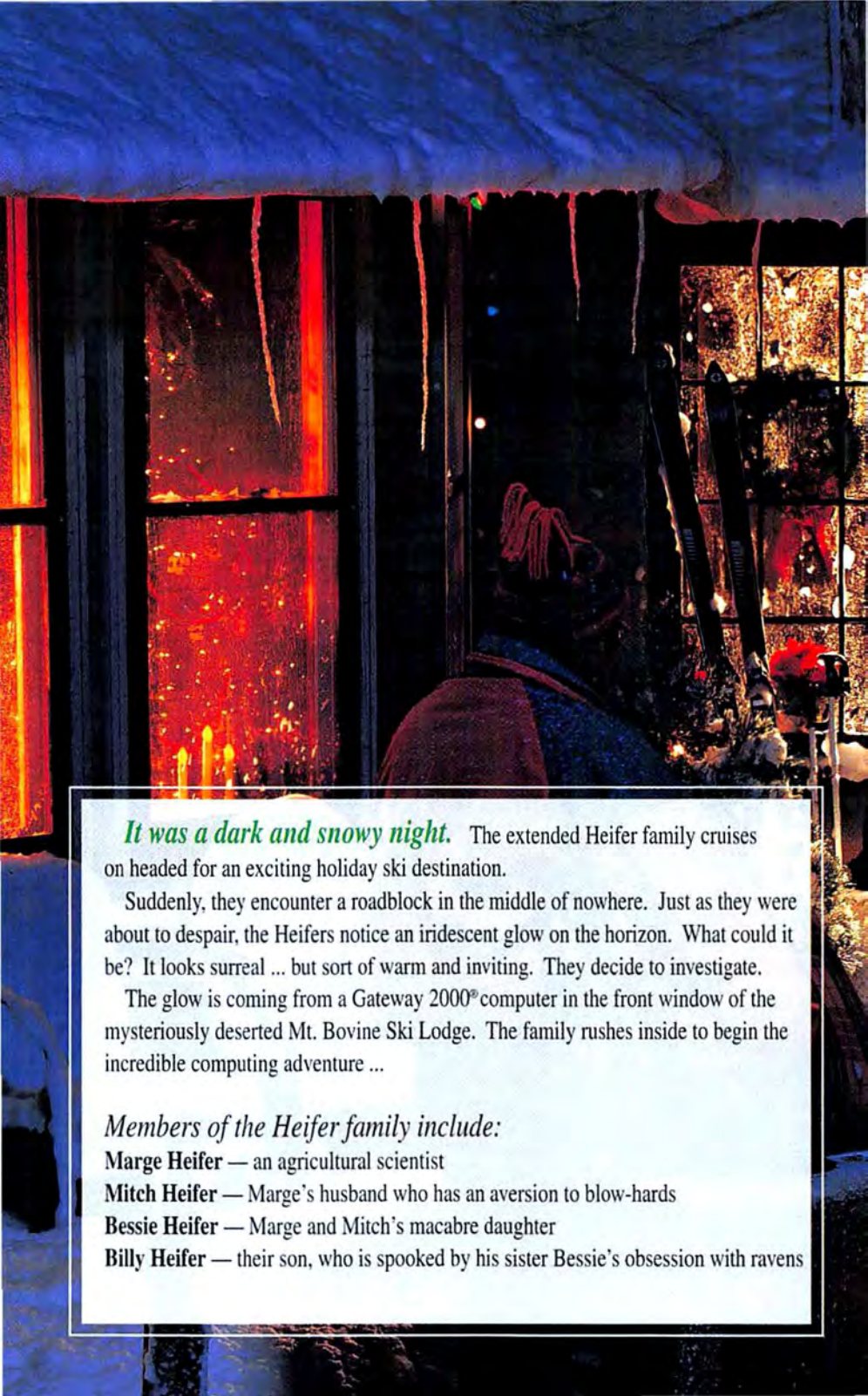


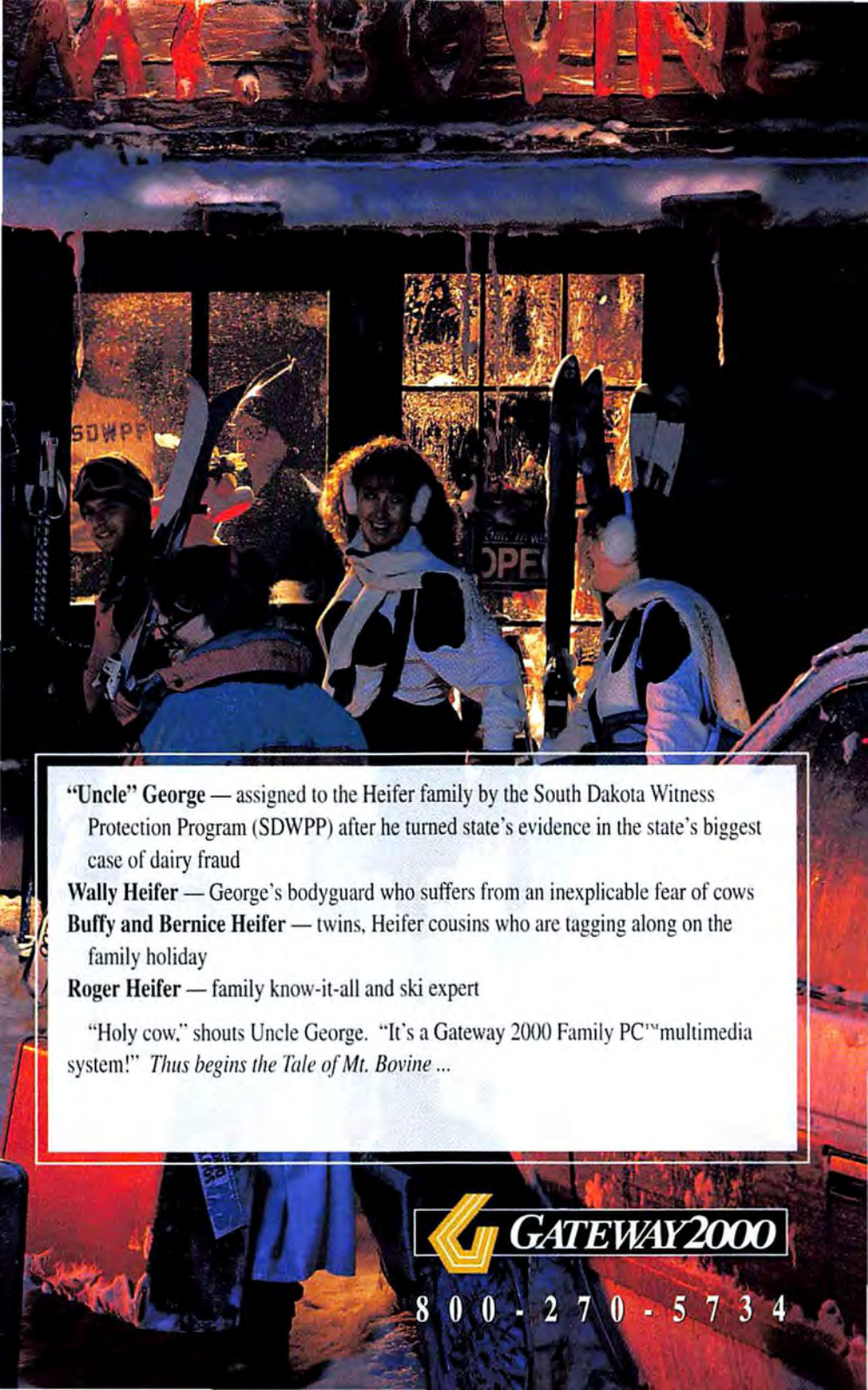
It was a dark and snowy night. The extended Heifer family cruises on headed for an exciting holiday ski destination.

Suddenly, they encounter a roadblock in the middle of nowhere. Just as they were about to despair, the Heifers notice an iridescent glow on the horizon. What could it be? It looks surreal ... but sort of warm and inviting. They decide to investigate.

The glow is coming from a Gateway 2000® computer in the front window of the mysteriously deserted Mt. Bovine Ski Lodge. The family rushes inside to begin the incredible computing adventure ...

Members of the Heifer family include:

Marge Heifer — an agricultural scientist
Mitch Heifer — Marge's husband who has an aversion to blow-hards
Bessie Heifer — Marge and Mitch's macabre daughter
Billy Heifer — their son, who is spooked by his sister Bessie's obsession with ravens



"Uncle" George — assigned to the Heifer family by the South Dakota Witness Protection Program (SDWPP) after he turned state's evidence in the state's biggest case of dairy fraud

Wally Heifer — George's bodyguard who suffers from an inexplicable fear of cows

Buffy and Bernice Heifer — twins, Heifer cousins who are tagging along on the family holiday

Roger Heifer — family know-it-all and ski expert

"Holy cow," shouts Uncle George. "It's a Gateway 2000 Family PC™ multimedia system!" *Thus begins the Tale of Mt. Bovine ...*

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MASTERS

"Wally, I'm happy as all get-out with this Gateway computer. Get out there and go skiing with your family. Anyway, there's no one here to recognize me," says Uncle George, busy at the keyboard the next morning. "And Wally ... quit whining about cows. I'm telling you, it's gotta be a theme resort, man. Just because it's called Mt. Bovine doesn't mean there's an Abominable Snow Cow herd out there." But George can't convince him. So Wally stays in with George, who is totally entranced by the **Gateway 2000® P5-100 Family PC™ multimedia system** standard with MPEG technology, and priced at only $2,199 — an unbeatable value!

New MPEG Technology For Movie-Quality Video

All Gateway 2000 Family PC multimedia systems now come standard with new MPEG (Motion Picture Experts Group) data compression technology for movie-like video performance. MPEG gives you incomparable full-screen, full-motion video right from your CD-ROM drive! Combined with the video scaler on all Gateway graphics cards (standard on our Family PC systems), moving pictures from all your MPEG multimedia applications will be smoother — no herky-jerky moving images here! And it won't be long until all your favorite flicks will be available on CD.

"Wally, get a load of this! In Gateway's Generations II software collection is Masters® Golf," exclaims George. "Check out all this live-action video and interviews with cool pros like Bobby Jones. I can't believe the video. It's just like being there! And Wally, I called the friendly folks at Gateway, and they say there are more MPEG-ready applications coming soon!"

850MB Hard Drives Minimum On All Gateway PCs!

Get the storage space you'll need to store today's and tomorrow's intensive software applications. Gateway 2000 introduces a new minimum standard — hard drives from 850MB to 2GB on all Gateway desktop PCs! Even with all the incredible pre-installed software on your Gateway system, you'll know that you still have plenty of room to go. These hard drives support DMA Mode 1 or 2, providing you with the best performance for multitasking environments like Windows® 95.

George can't believe his good fortune in discovering the Gateway P5-100 Family PC complete with MPEG technology. Meanwhile on Udder Trails, Buffy and Bernice think it's just plain rude for Uncle George and Wally to be so antisocial.

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Inseparable as always, the twins Buffy and Bernice head out to the moguls on Cud Pass. "I can't believe George and Wally are at that computer already this morning," pouts Bernice. "They are *so* ... hey Buffy, where is that incredibly cool music coming from? No way! Buff, that *computer* is pumping out those tunes!" So the twins spend their day with the **Gateway 2000® Holiday XL system**, while Mt. Bovine's entertainment, Disco Santa, lip synchs along to the high-fidelity sound.

Stereo Speaker Sound For The Audiophile At Heart!

You'll be in awe when you hear the amazing stereo sound of Gateway's Altec™ Lansing ACS-40 speakers now standard on all Gateway Family PC™ multimedia systems! Exclusively from Gateway 2000, these high-quality speakers are a step above any other standard speaker set in the industry.

Add our Altec Lansing ACS-250 subwoofer for only $75. Your speaker system will pump out an additional 40 watts of thumping bass on all your software applications and music CDs with this heart-pounding subwoofer.

Experience the full-bodied sound of a home stereo system with Altec Lansing ACS-400 speakers. These 1-foot-tall tower speakers include the ACS-250 subwoofer and Dolby® Pro-Logic Surround Sound for the epitome of stereo sound on all your multimedia applications and music CDs. The ACS-400s are available exclusively through Gateway 2000 as an upgrade from the ACS-40 speakers for just $120.

6X EIDE CD-ROM Drive For Super-Fast Performance

Be ready for tomorrow's technology with this lightning-fast 6X CD-ROM drive. It's the fastest EIDE CD-ROM found anywhere with 900KB/second data transfer rate and 214ms average access time. Combine the 6X CD-ROM with any Gateway

graphics accelerator standard on our Family PCs, and you'll get smooth full-motion video and be set for video scaling applications including MPEG and video conferencing.

"Bernice, I'm just blown away by the stereo sound of Gateway's Holiday XL speakers!" exclaims Buffy. "And I can't believe how cool and helpful those Gateway tech support people were today. Boy, I wish *we* knew that much about computers! Check out this Music Central™ 96 software application running on our really fast 6X CD-ROM." Meanwhile, back on Bull Run, Marge is anxious to try the business applications on one of those Gateway 2000 PCs, known for their high quality and value.

On a break from Bull Run, Marge and the kids, Billy and Bessie, are thrilled to find a **Gateway P5-120 Family PC™ multimedia system**. And Marge sees visions of the perfect holiday ahead with all the software applications available from Gateway.

Microsoft Windows 95 At Your Service

All Gateway 2000® PCs include Microsoft® Windows® 95 and are optimized to take full advantage of this new operating system! You'll be prepared to weather all the computing storms of tomorrow with Windows 95's 32-bit platform.

Gateway's New Generations II Software Collection!

You'll get 45 of the newest, most popular software programs in the world with Gateway's new Generations II software collection, pre-installed on all Gateway Family

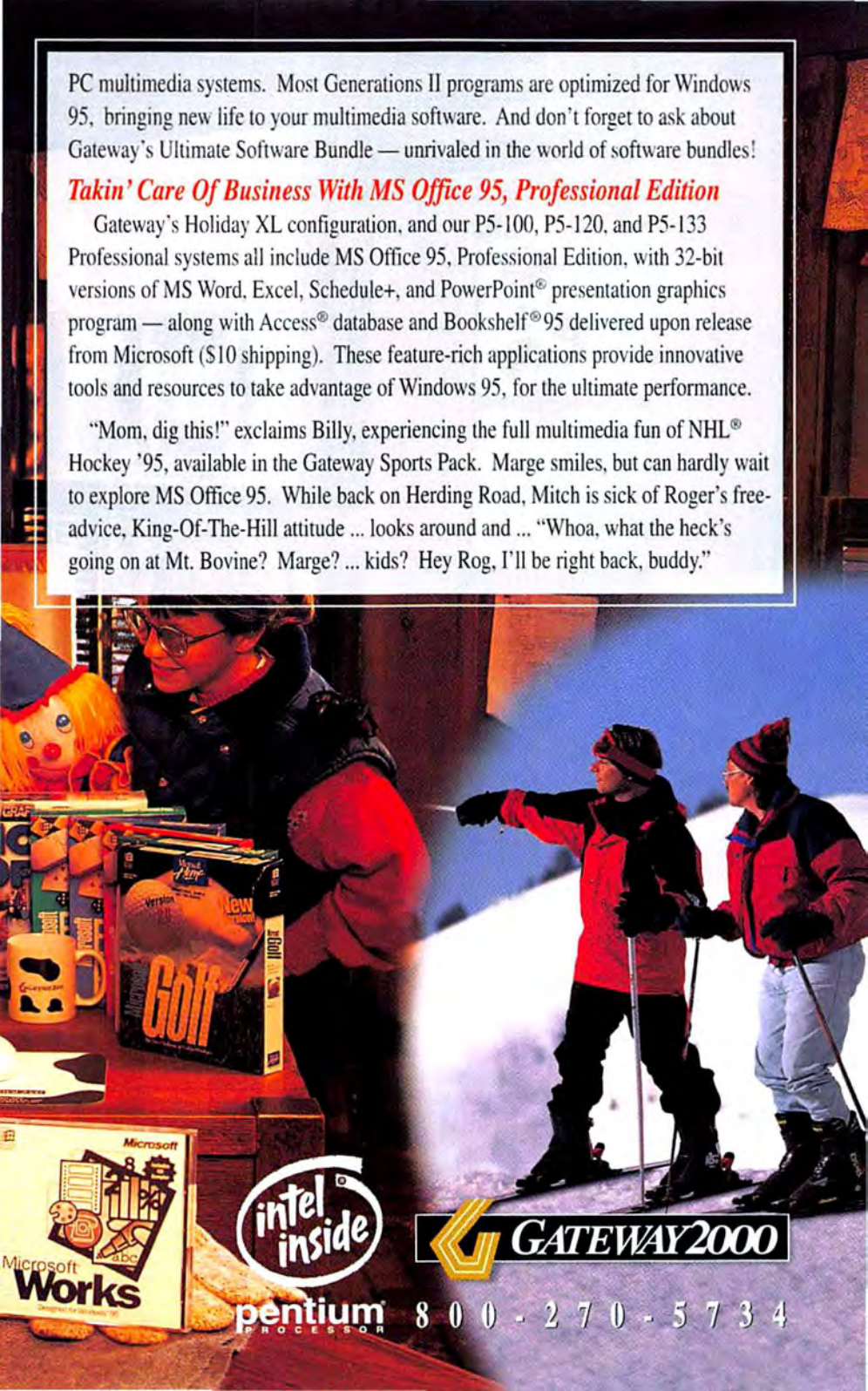
Featured with optional 17" CrystalScan® monitor.

PC multimedia systems. Most Generations II programs are optimized for Windows 95, bringing new life to your multimedia software. And don't forget to ask about Gateway's Ultimate Software Bundle — unrivaled in the world of software bundles!

Takin' Care Of Business With MS Office 95, Professional Edition

Gateway's Holiday XL configuration, and our P5-100, P5-120, and P5-133 Professional systems all include MS Office 95, Professional Edition, with 32-bit versions of MS Word, Excel, Schedule+, and PowerPoint® presentation graphics program — along with Access® database and Bookshelf®95 delivered upon release from Microsoft ($10 shipping). These feature-rich applications provide innovative tools and resources to take advantage of Windows 95, for the ultimate performance.

"Mom, dig this!" exclaims Billy, experiencing the full multimedia fun of NHL® Hockey '95, available in the Gateway Sports Pack. Marge smiles, but can hardly wait to explore MS Office 95. While back on Herding Road, Mitch is sick of Roger's free-advice, King-Of-The-Hill attitude ... looks around and ... "Whoa, what the heck's going on at Mt. Bovine? Marge? ... kids? Hey Rog, I'll be right back, buddy."



TOURIST INFORMATION
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"Know-it-all, big ski expert Roger," mutters Mitch as he enters the warm glow of Mt. Bovine lodge, "I've been itching to get in here with these computers for days anyway!" With that, Mitch stumbles into Mt. Bovine and almost lands right on a **Gateway 2000® P5-120 Family PC™ multimedia system** where he discovers a whole new world on the information superhighway!

Introducing The Gateway 2000 Information Highway CD

When you get a Gateway 2000 PC with fax/modem, your universe erupts with more information and communication capabilities at your fingertips than you ever thought possible! And we'll include our own Gateway 2000 Information Highway CD to make your navigation around this new universe easy. The Info Highway CD has a cool user interface with point-and-click graphical commands that lead you through trial memberships to CompuServe,® Prodigy,® America Online,® and Reuters Money Network online services. You'll also get GNN (Global Network Navigator®) for easy Internet browsing and FaxWorks™ with Voice communication software on CD.

Explore the entertainment world, access live chat lines and meet people from all over the globe, or converse with old friends and family! Reference early releases of publications such as *USA Today*, *People* and *BusinessWeek*. And get hooked into UseNet groups where people sharing common interests meet online for worldwide conversations and to exchange information. Access areas where you can download a million files of all types — free of charge! And for the world's most expert online technical support assistance, you can contact the Gateway 2000 BBS.

To get an edge on Roger, Mitch enters the ESPN site and talks to ski pros about all the latest slalom tips. But he's sidetracked and finds evidence that Uncle George donated his dairy heist money to the research of high-nutrition milk production. "Oh, just wait till I tell Marge! She's been wondering who gave her that anonymous grant money! And now that I'm online, there's nothin' stopping me from taking over as family know-it-all. See ya' Rog!"

Meanwhile Roger readies himself for Holstein Hill, Mt. Bovine's most treacherous downhill slope. He poises, glances around to make sure everyone's looking and ... "Hey! Where did they all go?! What *are* they doing? How could those Gateway computers possibly be more entertaining or informative than *me*? I'd better head back to Mt. Bovine to check out my competition!"

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"Hey Heifers! The roads are open. Let's go!" But Roger stops — in awe at the sight of the whole Heifer family happily computing on Gateway 2000® PCs. "Holy cow! You must be joking!" laughs George. "This is the coolest holiday this family's ever had! There's something for everyone here. Plus, Gateway gives you all the resources and technology to make initial start up, daily maintenance, and upgrading for the future easy. Boy, does that ever add to the overall value of a computer! And Gateway 2000 even has a 90-Day No Payment Program."

Value-Packed Pentium-Processors PCs For Today And Tomorrow!

Nearly all Gateway 2000 PCs include the Intel® Pentium® processor. All your applications will run better and faster with the extra oomph of this processor, and you'll be prepared to handle the new applications of the future!

Gateway 2000: Making Computing Easy For Everyone

Microsoft®'s new operating system makes working on your computer easier than ever. And all Gateway 2000 keyboards are designed with three keys specifically for Windows 95. The included MS IntelliType and IntelliPoint software will turn your keyboard and mouse into powerful, personalized computing tools.

All Gateway PCs are 100% Windows Plug and Play compatible. Plug and Play automatically recognizes and configures any new expansion hardware installed in your PC, making upgrading your system easier than ever.

You'll get all the resources you need, from Gateway's Quick Setup poster to our Information Highway CD, to award-winning toll-free tech support for quick, expert technical assistance. All Gateway PCs are built to order, so we'll custom-configure a computer to your exact specifications. And be sure to ask about our outstanding line of Gateway Solo™ portable PCs.

"Hey gang, we've gotta come back next year and bring the *whole* Heifer herd!" exclaims Roger, now a Gateway believer. "Just think of all the incredible stuff Gateway 2000 will have then. Mt. Bovine rules! Where do we make reservations?"

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90 DAYS
NO PAYMENTS
Ask About Our "90 Days No Payment" Program!

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Gateway 2000® Family PC™ Systems

P5-75 FAMILY PC

- Intel® 75MHz Pentium® Processor
- 8MB EDO Performance-Enhanced Memory
- **850MB 10ms DMA Mode 1 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **64-Bit PCI Graphics Accelerator w/ 1MB DRAM**
- 4X EIDE CD-ROM
- 16-Bit Gateway Sound Card
- **Altec™ ACS-40 Speakers**
- TelePath® 14.4 Fax/Modem Communication Center
- **Gateway Information Highway CD**
- 3.5" Diskette Drive
- 14" .28dp CrystalScan® Monitor
- 7-Bay Desktop Case
- **104+ Keyboard** & MS Mouse 2.0
- **Microsoft® Windows® 95**
- **Generations II Software Collection**
- **Gateway Gold™ Service & Support**

$1799

P5-120 FAMILY PC

- Intel 120MHz Pentium Processor
- 8MB EDO Performance-Enhanced Memory
- **1.62GB 9ms DMA Mode 2 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **64-Bit PCI Graphics Accelerator w/ 2MB DRAM**
- 6X EIDE CD-ROM
- 16-Bit Gateway Sound Card
- **Altec ACS-40 Speakers**
- **TelePath 28.8 Fax/Modem Communication Center**
- **Gateway Information Highway CD**
- 3.5" Diskette Drive
- **15" .26dp Vivitron™ Color Monitor**
- 7-Bay Desktop Case
- **104+ Keyboard** & MS Mouse 2.0
- **MS Windows 95**
- **Generations II Software Collection**
- **Gateway Gold Service & Support**

$2499

Gateway 2000 Manufacturing, North Sioux City, South Dakota is ISO 9002 Certified.

P5-100 FAMILY PC

- Intel 100MHz Pentium Processor
- 8MB EDO Performance-Enhanced Memory
- **850MB 10ms DMA Mode 1 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **64-Bit PCI Graphics Accelerator w/ 2MB DRAM**
- 6X EIDE CD ROM
- 16-Bit Gateway Sound Card
- **Altec ACS-40 Speakers**
- **TelePath 28.8 Fax/Modem Communication Center**
- **Gateway Information Highway CD**
- 3.5" Diskette Drive
- 15" .28dp CrystalScan Color Monitor
- 7-Bay Desktop Case
- **104+ Keyboard** & MS Mouse 2.0
- **MS Windows 95**
- **Generations II Software Collection**
- **Gateway Gold Service & Support**

$2199

Generations II SOFTWARE COLLECTION

■ Microsoft® Encarta® 96 ■ MS Cinemania®'96 ■ MS Julia Child: Home-Cooking with Master Chefs ■ MS Bob™, for Gateway 2000 ■ MS Works 95 ■ MS Publisher 95 ■ MS Money 4.0 ■ MS Golf ■ MS Music Central™ 96 ■ MS CD Sampler ■ MS Entertainment Packs 1-4 (31 fun games!) ■ Cash Graf Home Office Plus™ ■ Mayo Clinic® Family Health Book ■ Mediamatics Arcade™ MPEG Player ■ The Masters®: Interactive Journey Through Its 60-Year History, for MPEG

Gateway 2000® Family PC™ Systems

HOLIDAY XL

- Intel 133MHz Pentium Processor
- 16MB EDO Performance-Enhanced Memory
- 256K Pipelined Burst Cache
- **1.62GB 9ms DMA Mode 2 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **Matrox® MGA™ 2MB WRAM Graphics Accelerator**
- **6X EIDE CD-ROM Drive**
- 16-Bit Ensoniq® Wavetable Sound Card
- **Altec ACS-40 Speakers w/ ACS-250 Subwoofer**
- **TelePath 28.8 Fax/Modem Communication Center**
- **Gateway Information Highway CD**
- 3.5" Diskette Drive
- 17" .28dp CrystalScan Color Monitor
- 9-Bay Tower Case
- **104+ Keyboard**
- MS Mouse 2.0
- **MS Windows 95**
- **Gateway's Ultimate Software Bundle**
- **Gateway Gold Premium Service**

$3699

Ultimate Software Bundle!

Call today and ask how you can get both Generations II Software Collection and Microsoft Office 95, Professional Edition pre-installed on any Gateway 2000 desktop PC, along with Gravis GamePad™ — all for an unbeatable value!*

** MS Office 95, Professional Edition includes Word, Excel, PowerPoint® presentation graphics program and Schedule+, along with MS Access database and Bookshelf® '95 shipped upon release from Microsoft ($10 shipping fee)*

GATEWAY GOLD™ SERVICE & SUPPORT

Service When You Need It

- Toll-Free Technical Support 24 Hours A Day, 7 Days A Week
- Free Software Technical Support for all Gateway-provided operating systems & applications (includes Windows 95 Support)
- Industry-Leading Response Times For Toll-Free Support
- 1-Year On-Site Service Agreement**
- Next Business Day Response On-Site Service†
- Extended On-Site Service Hours (6a.m.-10p.m. Monday-Friday, 8a.m.-5p.m. Saturdays)
- Scheduled On-Site Service (2-hour appointment window)
- 3-Year Parts Only Limited Warranty**
- Express Replacement Parts Delivery
- Club Gateway™ Membership
- *GW2k™: Gateway Magazine*
- Gateway Bulletin Board (BBS) Service
- Automated FaxBack Service

†Pending parts delivery.
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Professional Systems

P5-75

- Intel® 75MHz Pentium® Processor
- 8MB EDO Performance-Enhanced Memory
- **850MB 10ms DMA Mode 1 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **64-Bit PCI Graphics Accelerator w/ 1MB DRAM**
- 4X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- 14" .28dp CrystalScan® Color Monitor
- 7-Bay Desktop Case
- **104+ Keyboard** & MS Mouse 2.0
- **MS Windows® 95**
- **MS Works 95**
- **Gateway Gold™ Service & Support**

$1599

P5-100

- Intel 100MHz Pentium Processor
- 8MB DRAM
- 256K Pipelined Burst Cache
- **1GB 10ms DMA Mode 2 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **64-Bit PCI Graphics Accelerator w/ 1MB DRAM**
- 4X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- **15" .28dp CrystalScan Color Monitor**
- 7-Bay Desktop Case
- **104+ Keyboard** & MS Mouse 2.0
- **MS Windows 95**
- **MS Office 95, Professional Edition***
- **Gateway Gold Service & Support**

$1999

Professional Systems

P5-120

- Intel 120MHz Pentium Processor
- 16MB DRAM
- 256K Pipelined Burst Cache
- **1GB 10ms DMA Mode 2 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **64-Bit PCI Graphics Accelerator w/ 2MB DRAM**
- 4X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- **15" .26dp Vivitron™ Color Monitor**
- 7-Bay Desktop Case
- **104+ Keyboard** & MS Mouse 2.0
- **MS Windows 95**
- **MS Office 95, Professional Edition***
- **Gateway Gold Service & Support**

$2499

P5-133

- Intel 133MHz Pentium Processor
- 16MB DRAM
- 256K Pipelined Burst Cache
- **1.62GB 9ms DMA Mode 2 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **64-Bit PCI Graphics Accelerator w/ 2MB DRAM**
- 4X EIDE CD-ROM Drive
- 3.5" Diskette Drive
- **15" .26dp Vivitron Color Monitor**
- 7-Bay Desktop Case
- **104+ Keyboard** & MS Mouse 2.0
- **MS Windows 95**
- **MS Office 95, Professional Edition***
- **Gateway Gold Service & Support**

$2799

Service Options

Gateway Gold Premium

- Extended Three-Year On-Site Agreement**
- Priority 800 Number For Access To Technical Experts **$99**

Gateway Gold Á La Carte

- On-Site System Installation
- On-Site Upgrade/Add-On Installation
- Hardware and Software Customization/ Integration

Ask your sales representative for details and pricing information.

*** Call or write us for a free copy of our on-site agreement.*

CALL TODAY! **for information on Gateway 2000's new Intel Pentium Pro processor-based systems.**

** MS Office 95, Professional Edition includes Word, Excel, PowerPoint® presentation graphics program, Schedule+, along with MS Access® database and Bookshelf® 95, shipped upon release from Microsoft ($10 shipping fee)*

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Get All The Sights and Sounds of

Incredible holiday extras from Gateway 2000, all at outstanding values. All peripherals and software sold only with the purchase of a Gateway system.

Multimedia

Audio Multimedia Kits

Everything you need to add multimedia to a Gateway 2000® PC. Choose a Gateway 16-bit CD-quality sound card or an Ensoniq® Soundscape™ 16-bit wavetable sound card. Both are Sound Blaster™ compatible and include two Altec™ ACS-40 speakers.

$95 *(Gateway 16-bit sound card and ACS-40 speakers)*

$115 *(Ensoniq Soundscape 16-bit wavetable sound card and ACS-40 speakers)*

Multimedia Speaker Upgrades

Upgrade the speakers in any Gateway multimedia kit by adding the all-new Altec Lansing ACS-250 subwoofer to provide up to 40 watts of additional bass.

$75 *(upgrade from systems which include Altec ACS-40 speakers)*

The Dolby Pro-Logic Surround Sound ACS-400 speaker system will make your CD audio multimedia applications come alive with theater-like surround sound. Complete with two Altec Lansing ACS-400 satellites and ACS-250 subwoofer.

$120 *(upgrade from systems which include Altec ACS-40 speakers)*

6X EIDE CD-ROM Drive

Access your software applications and documents faster than ever with this 6X EIDE CD-ROM drive from Gateway 2000 giving you 900KB/second data transfer rate and 214ms average access time. Supports multisession photo CDs and XA format, enabling simultaneous audio and data with additional hardware.

$100 *(upgrade from systems with 4X CD-ROM drive)*

4X Three-CD Changer

Enhance the value and usefulness of your PC with the 4X three-CD changer. It supports multisession photo CDs and XA format, enabling simultaneous audio and data with additional hardware. You'll have access to three times the amount of information of a regular CD-ROM drive.

$100 *(upgrade from 4X CD-ROM drive)*

CH FlightStick

The CH Flightstick is engineered specifically to look and feel like a jet joy stick. Features advanced throttle control, contour jet grip with two fire buttons and seven-foot cable. **$35**

Gateway accepts most major credit cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers. You can also apply for the Gateway 2000 DuoLine™ MasterCard® card, issued by Dial National Bank, Des Moines, Iowa.

90 DAYS
NO PAYMENTS

Ask About Our "90 Days No Payment" Program!

Gateway 2000 Extras!

Software

HOT PRICE **10th Anniversary Software Bundle**

Our special 10th Anniversary bundle includes BioForge™, Wing Commander III: Heart of the Tiger, Magic Carpet II: The Netherworlds, and a Gateway 2000 10th Anniversary T-shirt! **$49**
(BioForge may not be suitable for younger children.)

NEW **Kids Backpack™ II**

Our new Kid's BackPack II combines learning and fun in a software package specifically designed for kids. Includes What is a Bellybutton?; The Tale of Peter Rabbit; Cinderella; The Original Fairy Tale; Freddi Fish™ and the Case of the Missing Kelp Seeds™; and Pocahontas Reading Adventure, along with a Gateway cow-spotted backpack! **$59**

Starter Pack: The Sequel

A new twist on our favorite software bundle! Includes Tuneland™, Cyberia™, SimCity, Rand McNally TripMaker™, Hometime® Weekend Home Projects, 70 Million Households Phone Book, Consumer Survival Kit, and The 7th Guest™. Also includes 12-CD flip case holder. **$99**

Sports Pack

Includes Unnecessary Roughness '95™, Hardball 4™, FIFA International Soccer, PGA Tour® Golf, NHL® Hockey '95, and NASCAR® Racing. Also includes Gravis GamePad™ and 20-disc storage rack. **$99**

Flight Pack

Includes TFX™: Tactical Fighter Experiment, Aces Over Europe, Maximum Comanche®, Strike Commander, Privateer, Wing Commander™ Armada, and Warplanes. You also get a joystick and 20-disc storage rack. **$99**

Gateway's Ultimate Software Bundle:
MS Office 95, Professional Edition & Generations II

Call today and ask how you can get both Microsoft Office 95, Professional Edition and Gateway 2000's Generations II Software Collection pre-installed on any Gateway 2000 desktop PC, along with Gravis GamePad® — all for an unbeatable value!

Communications & Storage

TelePath® 28.8 Fax/Modem Communication Center

Internal fax/modem, 28,800bps modem, V.34, with 28,800bps fax capability. Sends and receives data and faxes, and also includes full voice mail capabilities. Includes the Gateway Information Highway CD giving you trial memberships to CompuServe®, Prodigy®, America Online®, Reuters Money Network online services, and GNN® for easy Internet browsing. **$149** *(Upgrade from TelePath 14.4 to 28.8 Fax/Modem $70)*

Colorado Memory Systems® Jumbo™ 1400 TBU

CMS Jumbo 1400 internal tape backup unit with up to 1.36GB compressed (680MB native) storage capacity per tape. Comes with MS Windows®and DOS® software, one tape and cable. **$199**

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More Gateway Ways To Make

Monitors

Gateway Vivitron™ Color Monitors

Non-interlaced color monitor using Sony® Trinitron® tube technology, capable of 1280 x 1024 resolution.

Gateway 15-Inch Vivitron Color Monitor, .26 dot pitch

Upgrade from a 14" CrystalScan® to 15" Vivitron monitor **$160**

Upgrade from a 15" CrystalScan to 15" Vivitron monitor **$75**

Gateway 17-Inch Vivitron Color Monitor, .26 dot pitch

Upgrade from a 15" CrystalScan to 17" Vivitron monitor **$365**

Upgrade from a 15" Vivitron to 17" Vivitron monitor **$290**

Gateway CrystalScan Color Monitor

Non-interlaced color monitor capable of 1280 x 1024 resolution.

Gateway 15-Inch CrystalScan Color Monitor, .28 dot pitch

Upgrade from a 14" CrystalScan to 15" CrystalScan monitor **$85**

Gateway 17-Inch CrystalScan Color Monitor, .28 dot pitch

Upgrade from a 15" CrystalScan to 17" CrystalScan monitor **$265**

(Upgrade prices good only at time of system purchase.)

Networking

3Com Ethernet Adapters

High-performance 16-bit Ethernet cards.

16-bit Triple Media Card with BNC, AUI and RJ-45 connectors **$109**

16-bit Card with only RJ-45 connector **$89**

SMC PCI Ethernet Adapter

32-bit card with both RJ-45 and BNC connectors **$139**

Printers

Epson® Stylus™ IIS Color Ink Jet Printer

Photo quality printing in color and black-and-white with 720dpi on high-quality glossy paper. Great for home use, this printer features easy-to-use drivers compatible with virtually all MS applications. **$339**

Epson Stylus™ II Color Ink Jet Printer

Perfect for the small business or home office, providing vivid color and crisp black-and-white printing at 720dpi on plain paper. Plus, it's quiet and compact. **$449**

Epson ActionLaser 1400 Printer

Features a high-performance RISC-based processor optimized to perform operations in fewer clock cycles than a standard CISC, as well as 600 x 600dpi with edge smoothing technology. **$499**

Lexmark Optra™ 12R

Corporate-quality printer with networking capabilities. Features a 25MHz RISC processor, 2MB memory, true 1200 x 1200 dpi, and prints 12ppm. **$1299**

Epson ActionPrinter 3260

This letter-quality, dot-matrix printer prints at 360 x 360dpi with a choice of 10 built-in typefaces and can be upgraded to color. **$209**

All printers include parallel cable.

Call for additional printer options!

Your Holidays Brighter!

Software Upgrades

Gateway's following special Microsoft Windows 95 and Office 95 Professional offers are available to existing Gateway 2000 customers only, as upgrades to DOS, Windows or MS Office.

Microsoft Windows® 95 Upgrade

Only available to our valued customers. Microsoft's new operating system will make your system faster and easier to use, and you'll get Gateway 2000 toll-free technical support for Windows 95 installation, configuration, and problem resolution. Order your copy today! **$94** *(On diskettes $104)*

Microsoft Office 95 Professional Upgrade

Microsoft Office 95, Professional Edition is designed to work specifically with the Windows 95 operating system, and includes 32-bit versions of Word, Excel, Schedule+, PowerPoint® presentation graphics, Access® database, and Bookshelf® 95 on CD. **$264**

Windows 95 & Office 95 Professional Upgrade

For an unbeatable combination value, get both MS Windows 95 and MS Office 95, Professional Edition. Microsoft Windows 95 operating system will make your system faster and easier to use. And you'll get Gateway 2000 toll-free technical support for Windows 95 installation, configuration, and problem resolution. Microsoft Office 95, Professional Edition is designed to work specifically with the Windows 95 operating system, and includes 32-bit versions of Word, Excel, Schedule+, PowerPoint presentation graphics, Access® database, and Bookshelf 95 on CD. **$349**

Service & Support

Gateway Gold™ Premium service and support is available to all new customers as an upgrade to Gateway Gold standard with all Gateway desktop systems. If you are already a Gateway customer and you purchased your Gateway computer on or after September 1, 1994, you can also upgrade to the Gateway Gold Premium service option for $99.

Gateway Gold Premium

- Extended Three-Year On-Site Agreement
- Priority 800 Number For Access To Technical Experts **$99**

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Portables

GATEWAY SOLO™

- Active Matrix Color Display
- Intel® Pentium® Processor
- 256K L2 Pipelined Burst Cache
- 1MB Video RAM
- Lithium-ion Battery & AC Pack
- 2 PCMCIA Type II, or 1 Type III Slots
- EZ Pad™ Pointing Device
- Removable Hard Drive
- 3.5" Modular Floppy Drive
- Integrated 16-Bit Sound with Stereo Speakers
- 86-Key Keyboard
- Parallel, Serial, Keyboard, Mouse, VGA & PS/2® Ports
- Built-In Mic, Headphone and Line-In Jacks and External Volume Control Dial
- Starting at 5.6 Lbs.*
- MS Automap® Road Atlas 4.0 (CD-ROM) & Ascend® personal information manager (for use with Franklin Day Planner®)
- Microsoft® Windows® 95**

V75

- 10.2" VGA (640 x 480) Display
- 75MHz Intel Pentium Processor
- 8MB RAM (expandable to 40MB)
- 540MB Hard Drive
- MS Works 95

$3499

$3699 (with CD-ROM Drive)

V90

- 10.2" VGA (640 x 480) Display
- 90MHz Intel Pentium Processor
- 8MB RAM (expandable to 40MB)
- Modular CD-ROM Drive
- 540MB Hard Drive
- MS Works 95
- Carrying Case

$3999

† MS Office 95, Professional Edition includes Word, Excel, PowerPoint® presentation graphics program and Schedule+. MS Access database and Bookshelf® '95 shipped upon release from Microsoft ($10 shipping fee)

S120 BEST BUY

- 10.4" SVGA (800 x 600) Display
- 120MHz Intel Pentium Processor
- 16MB RAM (expandable to 40MB)
- Modular CD-ROM Drive
- 1.2GB Hard Drive
- Desktop IR Receptor
- Extra Battery
- 28.8 PCMCIA Fax/Modem
- MS Office 95, Professional Edition†
- Deluxe Leather Travel Bag

$5999

S90

- 10.4" SVGA (800 x 600) Display
- 90MHz Intel Pentium Processor
- 16MB RAM (expandable to 40MB)
- Modular CD-ROM Drive
- 720MB Hard Drive
- MS Works 95
- Carrying Case

$4999

V75 DELUXE

- 10.2" VGA (640 x 480) Display
- 75MHz Intel Pentium Processor
- 16MB RAM (expandable to 40MB)
- Modular CD-ROM Drive
- 720MB Hard Drive
- MS Office 95, Professional Edition†
- Carrying Case

$4499

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Designed for Microsoft Windows 95

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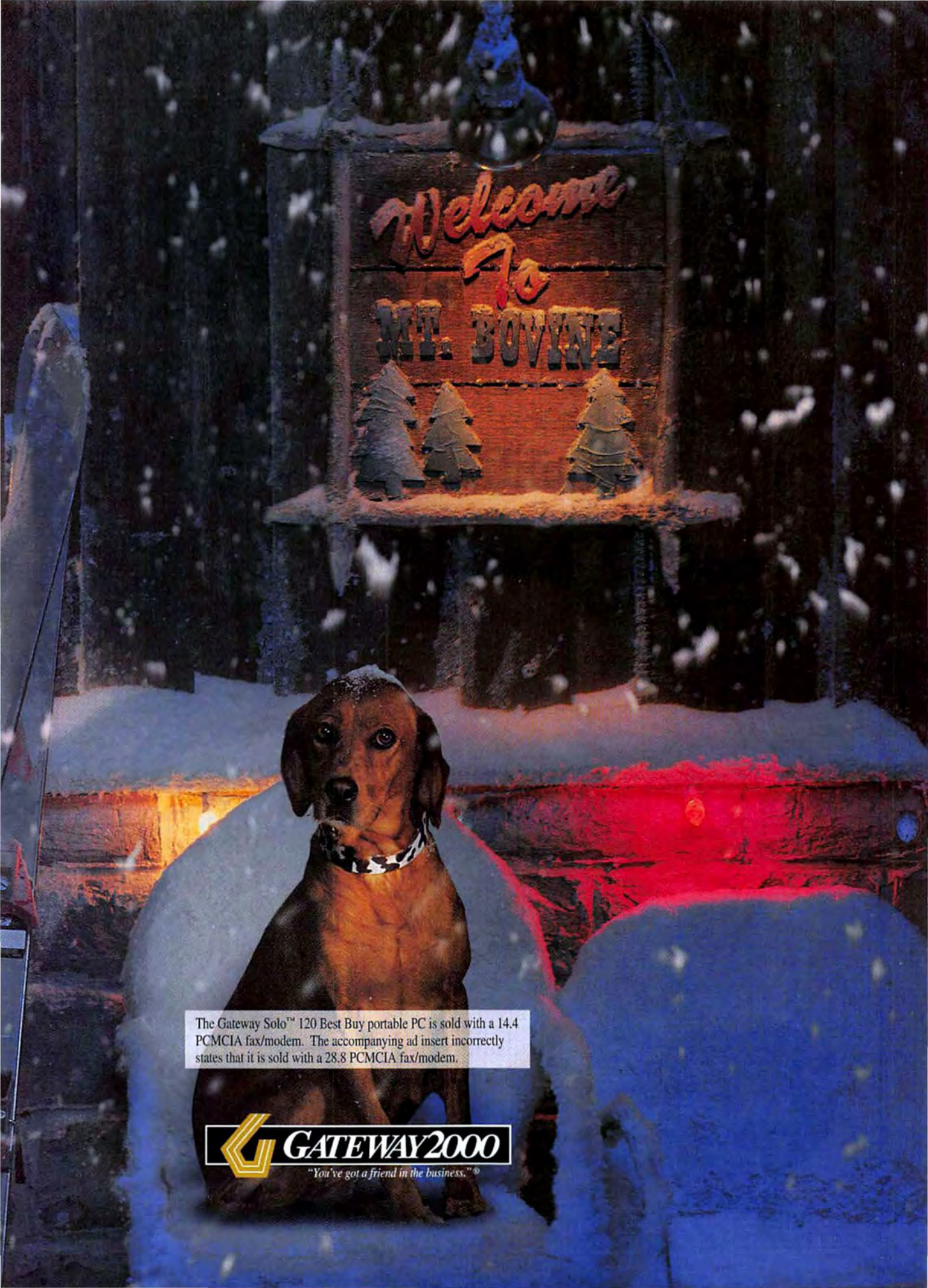

The Gateway Solo™ 120 Best Buy portable PC is sold with a 14.4 PCMCIA fax/modem. The accompanying ad insert incorrectly states that it is sold with a 28.8 PCMCIA fax/modem.

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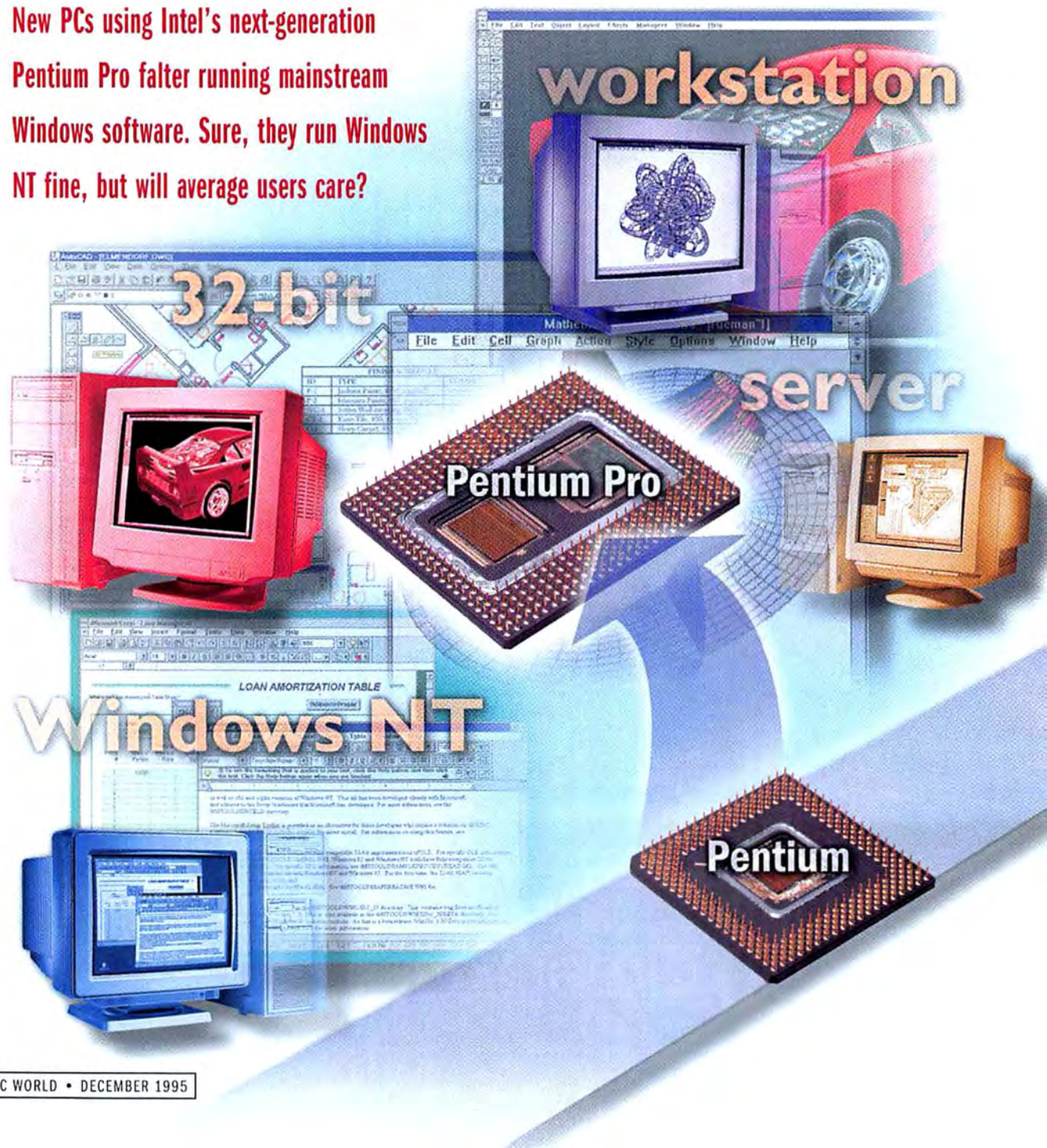
PENTIUM PRO VEERS

New PCs using Intel's next-generation Pentium Pro falter running mainstream Windows software. Sure, they run Windows NT fine, but will average users care?



Edited by Andy Reinhardt

OFF COURSE

Most people buy a new PC based on two criteria: how fast it will run their applications and how much it costs. By these measures, for general business and home users the first systems based on Intel's new Pentium Pro—the successor to the popular Pentium processor—have landed with a resounding thud.

Running 16-bit Windows 3.1 applications on Windows for Workgroups 3.11, preproduction 150-MHz Pentium Pro systems from Dell, Hewlett-Packard, IBM, and Micron were slower on average than comparable 133-MHz Pentium PCs. Windows 95 performance is expected to be better, but not by much (hardware incompatibilities prevented us from running Win 95 apps on the early Pentium Pro systems we tested).

On the other hand, Pentium Pro PCs hold their own—and sometimes fly—running Windows NT with native applications. For instance, combined Microsoft Word and Excel macros took on average 26 percent less time to run on Pentium Pros than on Pentium-133s. These new machines will thus compete less with commodity PCs than with UNIX- and NT-based workstations and servers based on chips like the Alpha, PowerPC, and SPARC. Pentium Pro systems could do well against these rivals, thanks to their full *x*86 software compatibility.

Given that Pentium Pro PCs will likely cost $1000 to $2000 more than today's top-of-the-line Pentium-133s, the message is clear: Unless you plan to run Windows NT in the next few months, don't buy a Pentium Pro. In the words of none other than Lew Pacely, Intel's marketing director for the Pentium Pro, mainstream users of Windows 3.1 and 95 "will find systems with today's Pentium processor a better value."

Why the poor showing with Windows 3.*x*? After all, the Pentium Pro offers improvements such as higher clock speed, a built-in secondary cache, enhanced pipelining, and more logic for executing instructions in parallel. Intel's explanation: The Pentium Pro's designers chose years ago to pump up 32-bit performance at the expense of 16-bit speed—the promise of 32-bit computing was in the air—which is why NT runs well on the chip while Windows 3.1 does not. In other words, Intel wagered that 32-bit software would be the rule by now—and lost the bet.

Power users who hunger for the fastest machine possible may still be tempted by Pentium Pro systems. But it's a safe bet that 150- and 166-MHz Pentium PCs, which should reach market early next year, will run Windows 3.1 and 95 faster than 150-MHz Pentium Pros and cost hundreds of dollars less. Moreover, Cyrix's 6x86 should offer price/performance similar to the Pentium-150's before the end of this year (see November's *Top of the News*).

All Souped Up and Nowhere to Go

The Pentium Pro systems we tested—the Dell Dimension XPS Pro 150, HP Vectra XU 6/150 PC, IBM PC 300 Pentium Pro, and Micron Pro 150 Magnum—sport similar designs and configurations (32MB of RAM, gigabyte-plus hard drives, fast CD-ROM drives, and graphics accelerators). The IBM and Dell machines use the same Intel motherboard, while the Micron uses a similar Micronics motherboard. In fact, with only one source for chip sets in the short term and with the secondary cache

Breaking News

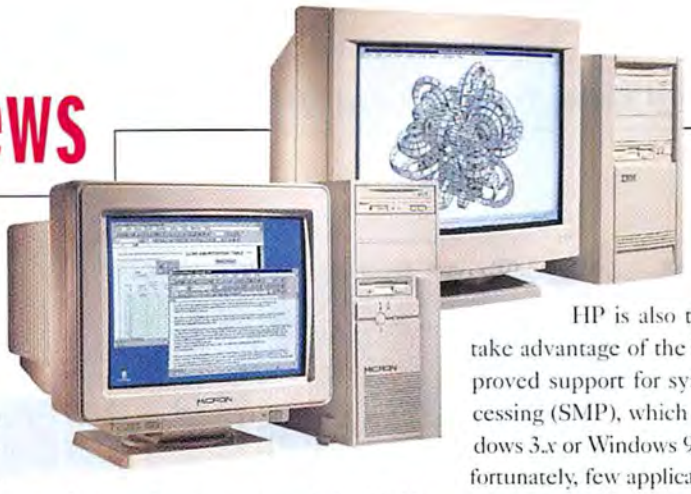
CHIPS AHOY: Sources tell us that PCs based on 90- and 120-MHz Pentium processors will soon become scarce because Intel is making prices for those chips unattractive to system makers. The result will be three-tier Pentium lineups from many vendors, with PCs clustering around 75-, 100-, and 133-MHz speeds. New 150- and 166-MHz Pentium PCs will start showing up in early 1996, analysts say.

Competitors aren't napping. IBM Microelectronics has announced its version of the Cyrix-designed 5x86 chip, slated to offer Pentium-75 performance for about 20 percent less cost, the company says. And AMD, which is planning to merge with rival NexGen, has delayed its K5 Pentium competitor again but will try to fill the gap with a low-end processor. Called the Am5x86 and expected in January, the chip—like the Cyrix 5x86—will fit into a 486 socket and offer Pentium-75 performance. —L. M.

NEW WEB SEARCH TOOL: If you're often dissatisfied with the results of Web site searches, Architext's excite (http://www.excite.com) can help. This online product uses unique conceptual search-engine technology to scan its growing database of cataloged Web sites for related concepts rather than just specific words, as other popular Web search tools do. The site is free, supported by advertising from the likes of MCI and Honda. In addi-

(continued on page 69)

LEFT: JEFF BERLIN; ABOVE: JEFFREY PELO



PENTIUM PRO PCs: Micron (left) and IBM PC 300.

(a key differentiator among Pentium PCs) built into the CPU itself, there's not a lot to distinguish one Pentium Pro from another. Instead, most vendors will try to outdo each other with hot peripherals.

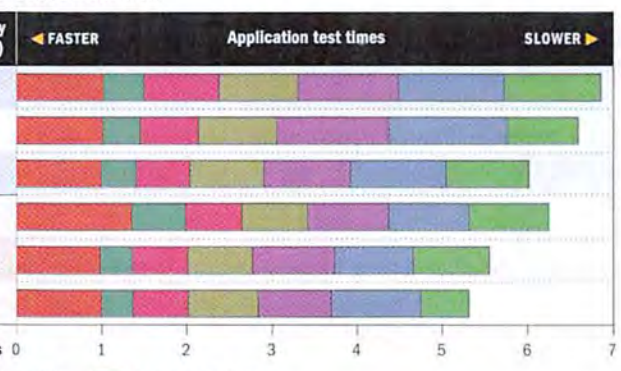
HP is the only company with its own motherboard, and the difference is apparent in features and performance. The Vectra XU 6/150 has three standout elements: a built-in Ultra SCSI interface for the largest, fastest hard drives available; a built-in Creative Labs sound chip; and support for dual interline memory modules. Unlike SIMMs, which must be added two at a time, DIMMs install one by one, which makes upgrading easier and cheaper.

HP is also the only vendor to take advantage of the Pentium Pro's improved support for symmetric multiprocessing (SMP), which NT (but not Windows 3.*x* or Windows 95) can exploit. Unfortunately, few applications are now optimized for SMP, so we ended up scrapping our dual-processor tests of the Vectra XU 6/150 when its results fell behind those for a single-CPU configuration. With a single

TEST REPORT

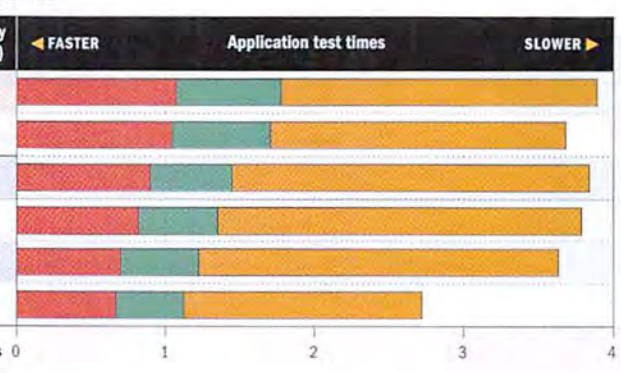
150-MHz Pentium Pro PCs Trail Pentium-133s Under Windows 3.1

	System	CPU	RAM (MB)	Secondary cache (K)
PENTIUM PRO	Micron Pro 150 Magnum	150-MHz Pentium Pro	32	256
PENTIUM PRO	IBM PC 300 Pentium Pro	150-MHz Pentium Pro	32	256
PENTIUM PRO	HP Vectra XU 6/150 PC	150-MHz Pentium Pro	32	256
	Quantex QP5/133 SM-2	133-MHz Pentium	32	256
	Tangent MediaStar 5133	133-MHz Pentium	32	256
	Cyrix M1 reference system	100-MHz 6x86	32	1024



Pentium Pro PCs Hold Their Own With 32-Bit Windows NT

	System	CPU	RAM (MB)	Secondary cache (K)
	Quantex QP5/133 SM-2	133-MHz Pentium	32	256
	Tangent MediaStar 5133	133-MHz Pentium	32	256
PENTIUM PRO	IBM PC 300 Pentium Pro	150-MHz Pentium Pro	32	256
PENTIUM PRO	Dell Dimension XPS Pro 150	150-MHz Pentium Pro	32	256
PENTIUM PRO	Micron Pro 150 Magnum	150-MHz Pentium Pro	32	256
PENTIUM PRO	HP Vectra XU 6/150 PC	150-MHz Pentium Pro	32	256



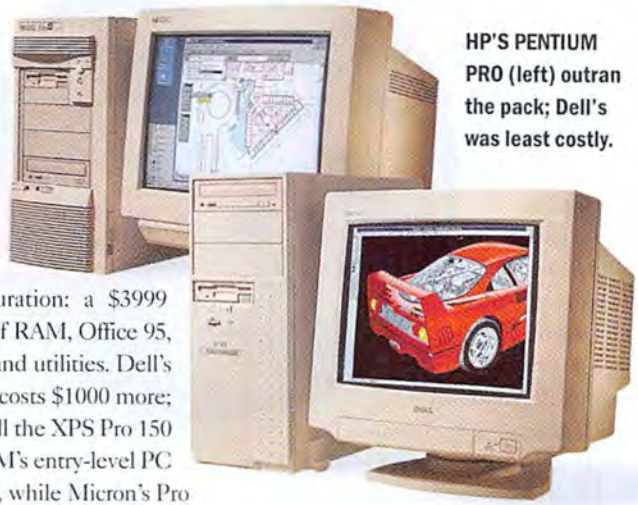
Methodology

We ran tests on Pentium, Pentium Pro, and 6x86 PCs configured with 32MB of system RAM and 64-bit graphics boards. The Dell, Micron, Cyrix, and Quantex systems had 2MB of VRAM; the Tangent had 2MB of graphics DRAM; the HP and IBM had 4MB of VRAM. Three systems had 2GB hard drives: the HP and Micron used SCSI interfaces, and Dell's was Fast-ATA/EIDE. The Quantex and Tangent had EIDE drives sized at 1.6GB and 1GB, respectively; the IBM and Cyrix drives were 1.2GB. On all systems, we set the graphics display to 800 by 600 resolution with 256 colors and small fonts. Systems were loaded with default configurations of Windows for Workgroups 3.11 and Windows NT 3.51. On Windows for Workgroups, we ran the standard PC World Test Center applications benchmark suite. On Windows NT, we ran macros in Microsoft Word 6.0 for NT and Excel 5.0 for NT. With Adobe Photoshop 3.0.4 for NT, we timed file operations and complex graphic operations (horizontal flip, filter-pixelate-mezzotint) on a large TIFF file.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

Pentium Pro processor, the Vectra racked up the best scores of the bunch, with a particularly impressive 50 percent lead over its nearest rival in the NT Photoshop test.

The Vectra is expected to sell for $6400; an additional $1600 nets you a second CPU. HP won't sell the computer with Windows 95, and it discourages its use with Win 3.*x*.



HP'S PENTIUM PRO (left) outran the pack; Dell's was least costly.

Dell is the only company offering a Windows 95 configuration: a $3999 package with 16MB of RAM, Office 95, and nine 32-bit apps and utilities. Dell's Windows NT model costs $1000 more; the company won't sell the XPS Pro 150 with Windows 3.*x*. IBM's entry-level PC 300 is priced at $5500, while Micron's Pro 150 Magnum will sell for $5899.

There's Still Life in the Old Chip

With P-133 prices dipping below $3000, only dedicated NT users seem likely to shell out for a Pentium Pro. But before you dismiss Intel's latest progeny, remember that the 150-MHz version won't be the last. Intel plans to release 166-MHz versions before year-end; these should offer about 10 percent better performance than 150s. In fact, every PC we tested seemed designed for processor upgrades. Stuart Cohen, worldwide marketing director for IBM's PC 300 line, acknowledges this possibility. "We're confident that our system will take faster chips, but without samples we can't say for sure," he says.

Intel may have misread its crystal ball this time, but consumers stand to win out: The unexpected fork in the path of *x*86 chip succession will heighten competition at both ends of the market. And there's always a possibility that the Pentium Pro could help push Windows NT into the mainstream. If that happens, other chips that also run NT will gain viability, and sizzling speed could become more affordable.

—Eric Knorr

Dell Dimension XPS Pro 150

Key Features: 32MB RAM, 2.1GB drive, 6X CD-ROM drive, 4MB graphics RAM, 17-inch monitor (NT version); 16MB RAM, 1.6GB drive, 4X CD-ROM, 2MB graphics card, 17-inch monitor (Win 95 version)
Pricing: $4999 (NT); $3999 (Win 95)
Dell Computer, 800/289-3355
Reader service no. 889

IBM PC 300 Pentium Pro

Key Features: 32MB RAM, 1.2GB drive, 6X CD-ROM, 4MB graphics RAM
Pricing: $5500
IBM PC Co., 800/426-4329

HP Vectra XU 6/150 PC

Key Features: 32MB RAM, 2GB SCSI drive, 4X CD-ROM, 4MB graphics RAM, speakers
Pricing: $6400
Hewlett-Packard Co., 800/322-4772
Reader service no. 890

Micron Pro 150 Magnum

Key Features: 32MB RAM, 2GB SCSI drive, 6X CD-ROM, 2MB graphics RAM, 17-inch monitor, Sound Blaster AWE-32 card, speakers
Pricing: $5899
Micron Electronics, 800/223-6571
Reader service no. 891

Breaking News

(continued from page 67)

tion, excite offers reviews of Web sites—100,000 should be posted by the end of this year. —G. M.

ALL-IN-ONE MULTIMEDIA CHIP: Chromatic Research has announced a chip that combines all the multimedia functions you can think of: 2-D graphics, 3-D graphics, video, MPEG, wavetable audio, fax-modem, telephony, and videoconferencing. The Chromatic design will bring down the cost of PCs while boosting their capabilities, says Toshiba, one of the firms that will manufacture the chip. Expect to see it on motherboards and add-in cards in the second quarter of 1996. —B. G.

SETBACK FOR E-SHOPPING: A squabble over Internet credit card standards could stymie development of online commerce and lead to higher transaction fees. To make online commerce viable, credit card information must be protected from hackers as it travels over the Net. Competitors from the worlds of personal finance (Visa and MasterCard) and software (Microsoft and Netscape) had been cooperating to develop such a standard. But now everything has fallen apart: Visa and Microsoft preemptively published two security specs of their own, leaving MasterCard, Netscape, IBM, CyberCash, and GTE to support a third. Critics charge that Microsoft and Visa are keeping key parts of their

(continued on page 71)

PHOTOS: JOHN GREENLEIGH; ILLUSTRATION: JEFFREY PELO

Windows 95: The First 30 Days

August 23, 1995: Retailers across the country open at midnight to sell the first copies of Windows 95. "I was at CompUSA at 12:01, and it was pretty much the **biggest collection of geeks** you've ever seen," says Thomas Failor, a systems specialist for TGI Fridays restaurants. "My wife thought I was the biggest dork in the world. But it was there. I had to have it."

Failor estimates there were 100 people waiting at midnight at the CompUSA store in Addison, Texas, near Dallas. "I was up at 3 a.m. installing it," he adds, with no big hitches except having to call Canon to get new drivers for his BJC-4000 ink jet. In the morning, the CompUSA store had three cash registers just for Windows 95.

The Egghead Software store in Cambridge, Massachusetts, welcomed the line of people stretching out the door with junk food, including a **bowl of Oreos and cheese doodles.** Mmmm.

Initial Sales Burst

In only eight days—from August 24 to 31—Windows 95 and the Plus add-on topped retailer charts as the best-selling products for the whole month. About 8 million copies of Windows 95 shipped to all sales channels in the first month, estimates analyst Rick Sherlund of Goldman, Sachs. About 7 million of those were sold, says Microsoft, **leaving 1 or more million sitting in warehouses or on shelves.** What about 32-bit Windows 95 apps? Distributor Intelligent Electronics tallied about 100 new programs in the first 30 days.

I Need Help!

Many customers worried that getting through to Microsoft technical support after Windows 95's release would be like trying to call Toys R Us on Christmas Eve. **By lunchtime on August 24, calls were running at capacity,** says Linda Glenicki, Microsoft's general manager of end-user support. During the first two weeks, the company received more than the 20,000 calls per day it had planned for—and nobody knows for sure how many callers were turned away by busy signals.

The calls also took longer than expected, contributing to the crunch during the first two weeks. **People waited as long as 45 minutes to get through to tech support** during the first weekend. But by now, the worst is over, Microsoft says.

Return to Windows 3.1

"At the user group meeting, I got advice to **wait for the first Windows 95 revision,**" says Diran Afarian, a general manager at Novita, a manufacturing company based in Pasadena, California, that serves the jewelry industry. "I'll listen better next time."

Start Me Up

Microsoft's marketing machine kicks into gear: More than 2500 people flocked to the company's Redmond, Washington, campus on August 24 for a circuslike official announcement of Windows 95.

Number of retail outlets that offered Windows 95 on August 24
20,000+

Number of in-store customer demos of Windows 95 prior to its launch
1.2 million

19th Nervous Breakdown

First Windows 95 call to technical support
12:08 a.m., August 24

Number of people staffing the lines for Microsoft tech support calls
1600

Average length of call
25 minutes

Hits to support-related areas of Microsoft's Web page
200,000 to 300,000 per week

(Source: Microsoft)

LEFT: NAJLAH FEANNY/SABA; ABOVE: HAVIV/SABA

JAMES B. NORMAN saw a slowdown.

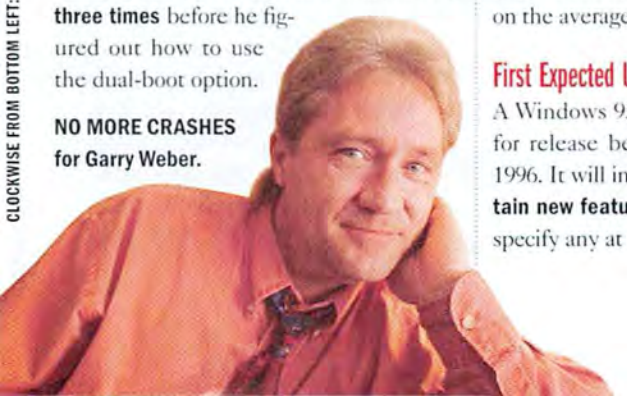
Afarian installed Windows 95 just days after the launch. Then he started doing the tech support shuffle: He couldn't get his modem to work right, even after three calls to Microsoft, two to U.S. Robotics, and finally the purchase of a new modem. "These kind of problems keep me from doing my job," he says, so he **purged Windows 95 from his PC at work** and reinstalled Windows 3.1.

Then he loaded Windows 95 on his home PC—and soon had printing problems with his LaserJet 4P and DeskJet 660C. "I call HP, they tell me it's Microsoft's drivers; I call Microsoft, they say it's HP's printer," he says. Now he's taking his friends' advice and waiting for the next release of Windows 95.

Forgive, Yes; but Forget?

If you've got a powerful system, it's easy to be happy with Windows 95, says Garry Weber, who runs his own photography company in Shaker Heights, Ohio, and uses a Pentium-133 with 16MB of RAM.

Weber encountered some initial aggravating glitches. He **installed Windows 95 three times** before he figured out how to use the dual-boot option.



NO MORE CRASHES for Garry Weber.

CLOCKWISE FROM BOTTOM LEFT: STEVEN BLOCH; ROGER MASTRIANNI; JEFFREY PELO

Then he had modem problems. As it turns out, his Diamond video board wouldn't let his modem be set to the COM port he was using. But now that Weber has Windows 95 up and running, all is forgiven. "It's real stable. I never crash anymore," he says.

Put Your PC in the Slow Lane!

James B. Norman, a cultural historian for the Oregon Department of Transportation, will tell you that despite what Microsoft might argue, **not all PCs are better off with Windows 95.** He installed the program easily on his home PC (a 33-MHz 486DX with 8MB of RAM), but then noticed a significant slowdown in his Win 3.1 apps.

"I turned off the wallpaper and screen savers, and most things run okay," Norman says. "But I still have problems with large apps, like Word." Under Windows 3.11, he says, Word loaded in about 9 seconds; under Win 95, it takes 15 seconds. "**Microsoft should have been a little more up front** about the effects Win 95 would have on the average user's equipment," he says.

Best-Selling Windows 95 Software, August 1995

1. Windows 95 Upgrade, Microsoft
2. Plus, Microsoft
3. Mosaic in a Box, Spry
4. Norton Utilities Windows 95 Upgrade, Symantec
5. Softram, Syncronys
6. Norton AntiVirus Windows 95 Upgrade, Symantec
7. Office 95 Upgrade, Microsoft
8. Norton Navigator Windows 95 Upgrade, Symantec
9. After Dark 95, Berkeley Systems
10. Word 95 Upgrade, Microsoft

(Source: PC Data)

First Expected Update to Windows 95

A Windows 95 "service pack" is planned for release between January and March 1996. It will include **bug fixes and may contain new features,** though Microsoft won't specify any at this time.

—Laurianne McLaughlin

Breaking News

(continued from page 69)

specs secret. Banks and vendors must choose between the competing camps or face the complications of supporting both. End users will likely end up bearing the cost. —D. M.

ONE PORT, 126 PERIPHERALS: By the middle of 1996, a new four-prong connector could replace the myriad ports on the back of your PC. The new Universal Serial Bus connection will let you daisy-chain up to 126 devices to a single port. Initially USB is expected to replace keyboard and mouse connectors; eventually it could also eliminate serial and parallel ports, says the USB committee, which includes giants such as IBM, Compaq, and Microsoft. Standardizing on this single interface is expected to make USB peripherals less expensive than their current counterparts. No vendors have yet announced specific plans to ship USB-compliant products. —G. M.

LOOK, MA, NO WIRES: A new chip from VLSI Technology will let makers of notebooks, printers, and add-in cards inexpensively support wireless infrared communications at speeds of up to 4 megabits per second, or 30 times faster than today's Infrared Data Association (IrDA) ports. Yet VLSI's chip costs only a dollar more than its predecessor, meaning it will add little to vendors' costs. VLSI says products using the chip should start showing up in early 1996. —A. R.

Edited by Randy Ross

The Packard Bell Trade-Off: Price vs. Satisfaction

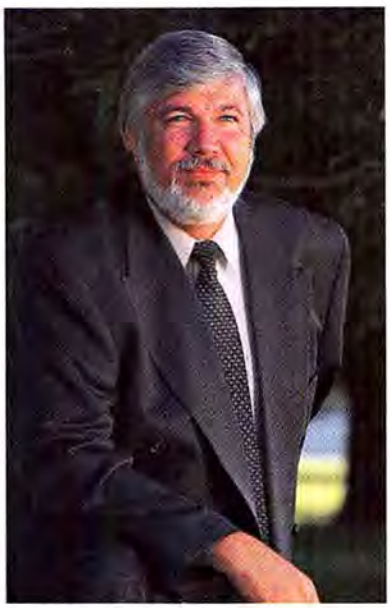
You've never seen commercials for Packard Bell during *Monday Night Football* or *Mad About You*. But open up your Sunday paper, and you'll be bombarded with pictures of Packard Bell systems. They fill up the front pages of circulars for computer superstores, office supply stores, and home electronics chains, all pushing the low-price PC of the week.

Packard Bell started selling through retail stores in 1986, long before its competitors, and since that time its PCs have become household names. While Compaq, IBM, and others courted big sales to Fortune 1000 companies, Packard Bell sold systems under labels such as Legend and Force to home customers, one PC at a time.

The business proposition was simple: Packard Bell offered customers the cheapest PCs, the fastest-changing and most up-to-date configurations, and the widest availability. Consumers responded by the millions, and nearly half of all PCs bought through U.S. retail stores from January to August 1995 were from Packard Bell, says Audits and Surveys, a market research firm in New York.

Are these best-sellers a good deal? In many respects, yes. If you're buying from a store, you can't beat the variety of features or the prices of Packard Bell PCs. The perks for first-time buyers are many: easier setup, tons of free software, and Navigator, the oldest and best of the Windows shells.

But a closer look at Packard Bell reveals some troubling problems. It consistently gets negative ratings for service, with its customers among the least likely to return for a second system, according to *PC World*'s Reliability and Service Monitor fax-back survey. Analysts also question the quality of Packard Bell PCs, saying they're less compatible and less reliable than those from competitors such as Compaq, Hewlett-Packard, and IBM.



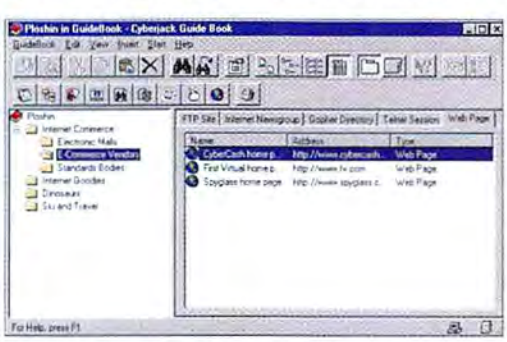
THE COMPAQ LAWSUIT HASN'T HURT, says Packard Bell's Mal Ransom.

These charges have not slowed the growth of Packard Bell; its sales rose an amazing 140 percent last year. But competition in home PCs is heating up: Hewlett-Packard, one of the most widely recognized brands in consumer electronics, is now making an aggressive bid to sell home computers; Compaq and IBM—names synonymous with high quality—have recently updated their lines and dropped prices to lure more home PC buyers. And just about every company is copying from the Packard Bell playbook.

Delrina Steps Up to Windows 95

Delrina's CommSuite 95 offers one-stop shopping for all your Windows 95 communications needs. This $99 software suite includes 32-bit Windows 95 updates of Delrina's well-regarded WinFax Pro and WinComm Pro, plus a new Internet program called Cyberjack.

New to WinFax Pro are on-the-fly compression, which speeds transmissions to fax machines that can handle it, gray-scale faxes for sharper photos and graphics, queuing, which lets you reorder outbound faxes, and hard-copy confirmation of transmissions. WinComm Pro offers an image viewer to display graphics as they download, a built-in .zip file manager to decompress files, and antivirus software that automatically scans zipped and unzipped files.



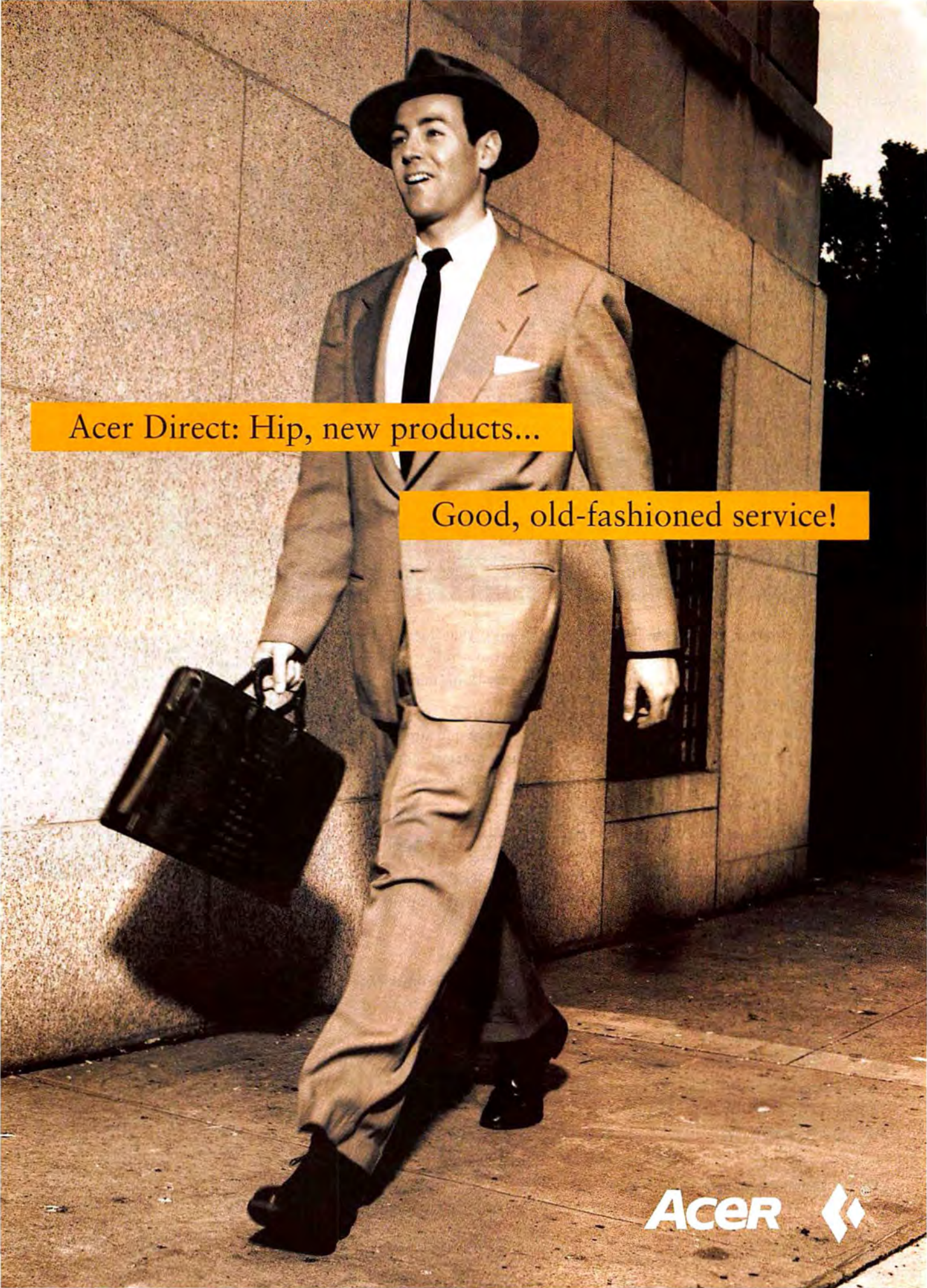
DELRINA'S CYBERJACK Internet software lets you set up GuideBooks pointing to all your favorite Internet resources.

The slickest new addition is Cyberjack, which provides a Web browser plus a full set of Internet tools, including Internet Relay Chat, Telnet, and FTP. All these features are accessible from the same screen. The only other product currently offering a similar integration of Internet applets is Wollongong's Emissary (see *New Products*, October). Cyberjack has a GuideBooks feature that lets you create a pick list of favorite Internet and Web sites, and it's Winsock compatible, so it works with your existing Internet account.

Delrina's CommBar wasn't ready for testing in the beta version of CommSuite 95 I examined. The app is designed to manage telephony features, including voice calls, Caller ID, voice mail, and auto-dial. Delrina Corp.; 800/268-6082, 416/441-3676. Reader service no. 888

—Peter Loshin

ROBERT HOLMGREN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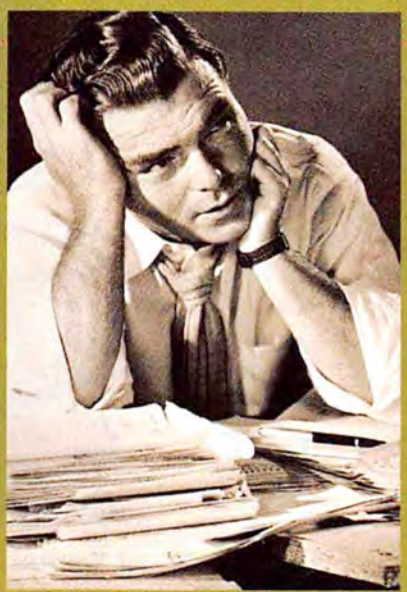
p? A: AcerNote Pro!

Back at your desk, you need a complete PC setup! Plug AcerNote Pro into its desktop docking station and access full-size monitor, keyboard, and desktop peripherals!



Now that you don't have to choose between a laptop or a desktop, you can take your work with you wherever you go!

AcerNote Pro P75MHz

75MHz Intel Pentium Processor
- **8MB System RAM (Expandable to 40MB)**
- **10.4" Dual-Scan LCD Displays 256 Colors**
- **500MB Externally Removable 2.5" Hard Disk Drive**

256KB L2 Cache
2 PCMCIA Type II/1 Type III Slot
Externally Removable 1.44MB Diskette Drive
Secondary Lithium Ion Battery Option
1MB PCI Bus Video with Graphics Accelerator
- **16-Bit Sound Blaster™- and Windows® Sound Systems-Compatible Stereo Audio Onboard with Built-In Speaker and Microphone**

Slim 8.97" x 11.7" x 1.97" System Case Weighs 6.4 lbs., Including NiMH Battery
Personal Organizer and Hoyle® Classic Card Games Included
- **Microsoft® Windows 95**
- **Three-Year Limited Warranty with One-Year Next-Business-Day Replacement in the U.S. and Canada**

Free Extra Battery with every AcerNote Pro

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SAME CONFIGURATION AS ABOVE WITH:
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intel inside pentium

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Docking Station Features Include:
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onday through Friday 6 AM-6 PM and Saturday 8 AM-4 PM Pacific Time. Acer computers are also available at fine retailers and resellers. hen calling, please reference #125 ACD. Specifications and pricing are subject to change. Prices valid through December 31, 1995.

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Circle 102 on reader service card

Something for Everyone

Link Resources, a market researcher in New York City, estimates that 90 percent of home PCs bought this year will come from retail stores, and Packard Bell's appeal to those millions of customers is simple: price.

"I shopped around quite a bit and looked at all the major brands," says Robert Blakely, a manager at Southwestern Bell in Oklahoma City. Blakely wound up buying a Legend. "I couldn't justify spending more money when Packard Bell had the same features," he says.

While Packard Bell PCs usually cost less than those from Compaq or IBM, they feature state-of-the-art technology, says Bruce Stephen, vice president of worldwide personal systems research for International Data Corporation, a market researcher in Framingham, Massachusetts: "[Packard Bell is] very good at taking new technologies—from CPUs to hard drives to multimedia—putting them into systems, and getting them to market quickly."

The company's new manufacturing facility in Sacramento, California, was designed with that speed in mind. Though executives won't disclose the capacity of the 750,000-square-foot facility, Mal Ransom, vice president of marketing, says it's "well beyond the 2.2 million PCs that we shipped last year."

However, says Seymour Merrin, president of Merrin Information Services in Palo Alto, California: "Packard Bell doesn't have the world-class manufacturing of Compaq or Hewlett-Packard." As with many competitors, Packard Bell uses outside suppliers for most components and subsystems, but it does design and make some of its own motherboards and has developed a few custom cards, such as an innovative fax/modem/sound/telephony board it introduced late last year.

Flexibility is essential for Packard Bell, given its many product lines and configurations. At any time, the company may have up to 100 different models for sale, says Fred Kerns, vice president of product marketing. Thus, though nearly every big retailer sells Packard Bell PCs, it's hard to find the same system at any two stores (see the chart "Doing the Configuration Shuffle").

THE "CORNER" PC is typical of Packard Bell's clever packaging.

Retailers Before Consumers?

This profusion of choices speaks volumes about Packard Bell's approach to consumers. The company has product lines for four different types of stores. The many configurations offer something for everyone, but also make it hard to compare prices across outlets—and thus to take advantage of stores' price protection pledges.

Retailers also appreciate that Packard Bell offers only a one-year warranty on its home PCs (some top makers have three-year plans), because this lets them sell lucrative extended warranties. For consumers it's a mixed bag: The one-year warranty keeps prices low, but they may end up paying more for service in the long run.

Despite its recent investment in a new manufacturing facility and growing use of in-house engineering, Packard Bell is not generally regarded as a leader in system design. Rather, its strength lies in an ability to respond quickly to changing markets. How does this approach to making and selling systems affect quality? In responses to *PC World*'s monthly Reliability and Service Monitor, Packard Bell consistently falls in the middle: In our most recent survey report (see "From Apple to Zeos: Rating Today's PCs"), its PCs were rated "fair" for reliability, matching those sold by Acer, Gateway, and Leading Edge. By comparison, Compaq and HP, among others, were rated "best" for reliability, and IBM and Dell got "good" scores.

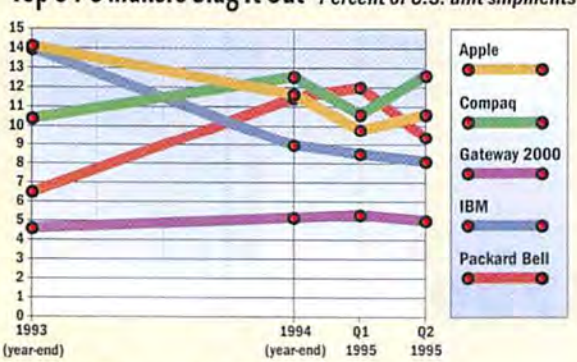
Sensing a weakness, Packard Bell's closest rival is attacking the quality of its PCs. In a suit filed last spring, Compaq alleges that Packard Bell reuses parts from returned PCs and sells the systems as new. This practice lets Packard Bell sell PCs at drastically lower prices, giving it an unfair edge over competitors, Compaq says.

Packard Bell responds that recycling some parts from returned systems is common in the PC industry, adding that it employs rigorous standards to ensure that only like-new parts are reused. "All components are tested...and only components that pass that test are recycled," says company attorney Marshall Grossman.

JOHN GREENLEIGH

Top 5 PC Makers Slug It Out

Percent of U.S. unit shipments



Source: Dataquest, San Jose, California

PACKARD BELL'S MARKET SHARE HAS SOARED over the last two years, but it dipped slightly in the second quarter of 1995 under increased pressure from archrival Compaq.

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INTRODUCING QEMM 8.
MORE MEMORY, MORE MEMORY, AND STILL MORE MEMORY
FOR WINDOWS 95, WINDOWS 3.1 AND DOS.

AMAZING NEW TECHNOLOGY

The world's best-selling memory management program is now bigger than ever.

Quarterdeck's QEMM 8 breaks through barriers to squeeze every last byte of memory out of your computer. With a program that's generations ahead in technology, safety and ease of use. And comprehensive enough to let you run all the applications you need, from 32-bit Windows 95 all the way back to DOS.

QEMM 8 uses three key technologies:

QEMM's memory multiplying technology is a proprietary method that compresses physical memory. This, combined with a unique technique to speed up virtual memory gives you maximum available Windows memory. So you don't need to fork out hundreds of dollars for expensive RAM chips.

Just point and click to optimize your PC.

QEMM's resource manager frees up Windows 3.1 User and GDI resources. So you can open more programs simultaneously without those dreaded 'Out Of Memory' messages.

QEMM's system memory management squeezes up to 634K out of the 640K, with patented Stealth technology that maps system ROM into other areas of memory. This doesn't just make your programs and games under the DOS prompt scream right off your screen, it gets Windows the memory it needs.

Manifest gives you a 'view under the hood' of your PC.

No other memory program does so much.

Or does it so well. All this power comes to you in a package that's incredibly easy to set up, optimizes your PC automatically and lets power users fine-tune the settings.

QEMM 8 also comes with Manifest®, so you can see what's happening with your memory and other system components like PCMCIA adapters.

Not that you'll ever have anything to worry about. Over 10 years of experience in memory management makes QEMM 8 one of the most dependable programs.

You couldn't do more for your computer than visit your local dealer today. For more information, go to www.quarterdeck.com or call 1-800-683-6696.

Circle 179 on reader service card

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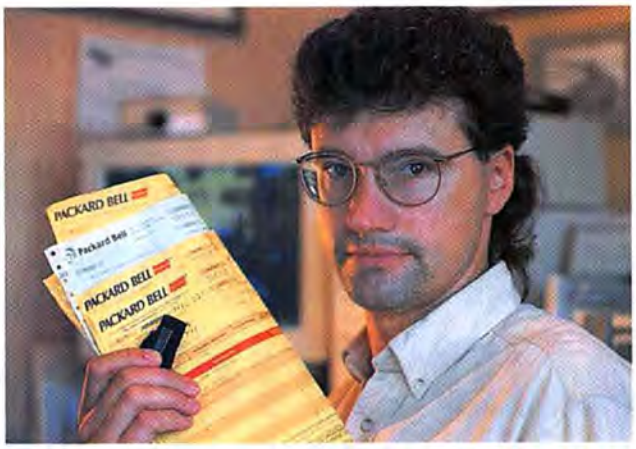
The case, scheduled to go to trial in February, prompted a class action suit by Packard Bell system owners, as well as investigations into the company's manufacturing practices by attorney general offices in several states. The Federal Trade Commission is also reportedly investigating the recycling issue, but an FTC spokesperson would not confirm this.

While denying that it engaged in wrongdoing, Packard Bell quickly settled the class action suit and in October countersued Compaq, charging unfair competition, defamation, and false advertising. The complaint calls Compaq's suit a "ruthless smear campaign...to discredit Packard Bell and mislead consumers and businesses" and alleges that Compaq misrepresents its own practice of recycling parts from returned PCs. Compaq says the Packard Bell charges are without merit.

Service Woes

Packard Bell's other weak spot is service, and a confluence of events in the last two years has not helped. In January 1994 the company's headquarters were destroyed in an earthquake that hit Southern California. The service operation had to start over from scratch, relocating to Magna, Utah, with a core staff of just 90 people to answer thousands of calls a day. Although the firm is hiring 100 to 200 technicians per month, staying on top of calls is an uphill battle when you're growing so quickly, says John Hlavac, vice president of international service and support.

These difficulties are reflected in five consecutive Reliability and Service reports since June 1994, in which *PC World* readers rated Packard Bell's service as among the "worst" of all firms reported on. In the latest report, respondents said it took an average of 40 hours to reach a Packard Bell technician who helped solve their problems, compared to the 30-hour average for all companies. Repair times are also longer than average, and Packard Bell owners who responded to the survey reported one of the lowest levels of satisfaction with any company in our report.



NOT A HAPPY CAMPER: Packard Bell customer Bob Brockmeyer calls his travails with product support "a big waste of my time."

Catching Up

Bob Brockmeyer, a car dealership service manager in St. Louis, has owned Packard Bell desktop and notebook computers and says he was satisfied with them until he needed customer service. When his notebook's battery and charger failed, it took five months to get a replacement. He wound up returning his desktop system after repeated problems trying to get a memory upgrade. "As far as I'm concerned, it was a big waste of my time," says Brockmeyer.

There are now roughly 2000 support technicians answering phones at Packard Bell's Utah facility; Hlavac says the goal is to get hold times down to less than 2 minutes. The company is installing a new phone system that includes fax-back capabilities for quick answers to common questions, and new customer tracking software designed to help technicians diag-

The Web Browser: Shopping for PC Hardware on the Net

When you shop for software using your state-of-the-art 28.8-kbps modem, you can get whatever you buy via the same modem. But you can't download a laser printer or a new hard drive, so why bother shopping for hardware online? Think of it as a new breed of interactive catalog: The Internet Shopping Network at http://www.internet.net/ includes daily sales specials and links to product reviews. You can buy products with an encrypted credit card number...BizWeb organizes more than 1000 vendors into a Yahoo-like hierarchy at http://www.bizweb.com/, highlighting recently updated pages and vendors that take orders online...Would you rather buy by phone? Try the Guide to Computer Vendors at http://www.ronin.com/SBA/, which maintains a bank of toll-free numbers and a list of resellers...If you're interested in this month's *PC World* Top 20 PCs, the vendor with the most complete product information, support, and sales assistance is Dell, at http://www.dell.com/. You still have to place orders over the phone. And Dell hasn't figured out how to squeeze a Pentium PC through a phone wire, so you'll still have to wait awhile for delivery.

—Richard Overton

PRODUCTS ON THE INTERNET SHOPPING NETWORK are grouped by platform, category, vendor, and new products. When you find what you want, you can buy online—and save a trip to the mall.

PHOTO: STEVEN BLOCH; ICON: JEFFREY PELO

QUARTERDECK

CLEANSWEEP 95™ FOR WINDOWS 95 WILL UNINSTALL ALL YOUR OBSOLETE PROGRAMS.

(LIKE, OH FOR INSTANCE, UNINSTALLER.®)

Sorry Uninstaller, but the new Quarterdeck® CleanSweep 95 just swept you under the carpet. While you may be excellent at uninstalling those bitty 16-bit programs, that skill won't get you very far in Windows 95.

Windows 95 is big, with big 32-bit programs. CleanSweep 95 is smart and powerful, with native 32-bit power to remove any program in the Windows 95 world – both 16- and 32-bit.

And it does it much faster than other (uh-hmmm) uninstallers, so you don't have to twiddle your thumbs for hours every time you uninstall something, archive it or go searching for leftover bits of unwanted files.

Quarterdeck CleanSweep 95 is also much safer to use than other uninstallers. Much easier, too. Wizards do most of the work for you – all that's left to do is simply click.

To see for yourself everything CleanSweep 95 can do, call 1-800-683-6696 for your free trial edition. Or you can download a copy from our Web site at www.quarterdeck.com.

Even better, pick up the real thing. You may also qualify for a specially priced competitive upgrade from any participating retailer.* Or you can order by phone: 1-800-683-6696.

HURRY! UPGRADE OFFER ENDS DECEMBER 15, 1995.

Circle 225 on reader service card

*Special upgrade offer applies to registered users of Microhelp Uninstaller, Vertisoft Remove-It, Landmark Uninstall-It, IMSI Windelete, and, of course, Quarterdeck CleanSweep. Dealer prices may vary.

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nose problems more quickly. But while these are steps in the right direction, they merely bring Packard Bell into line with what many other PC vendors have done for years.

Equally telling is that Packard Bell has only recently started hiring technicians based on sales projections instead of booked orders. Until the policy was changed, the company was constantly playing catch-up with its own success.

Bigger Fish to Fry

The brouhaha over used parts and the ongoing concerns about service come at a bad time for Packard Bell: Having conquered the consumer market, it's turning its attention to business customers, establishing a separate division with its own sales, marketing, and product development teams to target corporate accounts. Although quick to note that Packard Bell is still committed to consumers, marketing vice president Ransom says there's huge opportunity for the firm in the business world as well.

Ransom insists the Compaq lawsuit hasn't hurt Packard Bell in the consumer market. But the controversy could damage its reputation with corporate buyers. "They'll be put under a microscope in the medium and large business market," says IDC analyst Stephen. "Price isn't the full measure of value of a product; [these customers] also need to consider the cost of ownership, of servicing the product, or of supporting it on a network." A relationship with NEC Technologies, which acquired roughly 20 percent of Packard Bell in July, could boost its credibility with business customers.

Meanwhile, Packard Bell's bread-and-butter consumer franchise is being targeted by Compaq, Hewlett-Packard, and IBM. If price differentials between the company's systems and competing PCs decrease, other factors, such as service, support, and reliability, will assume greater importance in buying decisions. To be a long-term player, Packard Bell must focus more on customer satisfaction. "The real pressure hasn't been applied yet," says Stephen. When the battle for consumers goes into high gear, he says, "it's going to get ugly."

—Roberta Furger

Additional research and reporting by Angela Freeman.

Doing the Configuration Shuffle

n/a = not applicable

	Circuit City	CompUSA	Price-Costco	Staples
Packard Bell model	Legend	Force	Pack-Mate	Axcel
Model number	406CD	480CD	3987CD	467
Processor	Pentium-75	Pentium-75	Pentium-75	Pentium-75
RAM	8MB	8MB	8MB	8MB
Hard drive	850MB	850MB	720MB	1.3GB
CD-ROM drive	4X	4X	4X	4X
Price with monitor	$1819.94	n/a	$1799.77	n/a
Price without monitor	n/a	$1599.99	n/a	$1698.97
Other retailers selling this model	The Good Guys, Sears	Computer City	none	Office Depot, Office Max

COMPARISON SHOPPING BETWEEN PACKARD BELL MODELS at different retailers is difficult because the systems are sold under various names and in slightly different configurations.

Bug Watch Drives Corrupted in PCI Systems

▶ Bug: A large number of 486 and Pentium PCI system boards contain a faulty PCI-to-IDE interface chip that can corrupt data on the hard disk. The problems with the PC-Tech RZ1000 chip occur under OS/2 version 2.1 and later and Windows NT 3.1, but not with DOS, Windows 95, or versions of Windows NT newer than 3.1.

The RZ1000 is used on many PCI bus PCs sold by Dell, Gateway, AT&T, and others. Intel Premiere and Plato motherboards using the Neptune chip set, plus some non-Intel boards, have the chip; new Intel boards based on the Triton chip set do not.

Developer PowerQuest has a free text-mode OS/2 program, iotest.exe, that tests for the faulty chip. The archive file iotest.zip is on the firm's Web page at http://www.powerquest.com/download/ and in the General Hardware library of CompuServe's PC Hardware Forum (go pchw).

▶ Work-around: Some system BIOSes offer a "PCI IDE prefetch buffers" setting that, if disabled, prevents the error from occurring. This will cause a noticeable drop in hard disk performance. Not all machines with the bad chip let you change this setting.

▶ Fix: IBM has created an OS/2 IDE driver patch (contained in the archive file pj19409.zip) that kills the bug by disabling IDE prefetch buffers. The file's on CompuServe in the IBM Files (SUPP) library of the IBM OS/2 Support Forum (go os2suppo), on AOL in the Patches/Fixes library of the OS/2 Forum (keyword os2), and via FTP at ftp://ftp.software.ibm.com/ps/products/os2/fixes/v3.0warp/english-us/. Microsoft's NT 3.1 patch, pciatdisk.exe, is available via BBS at 206/936-6375 and at http://www.microsoft.com/KB/softlib/BackOffice/q_miscnt.htm.

—Scott Spanbauer

JEFFREY PELO

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MAGNARAM.

Now that MagnaRAM's around, you'll be seeing a lot fewer "RAM doublers" in the neighborhood. How can they possibly compete against the 32-bit memory multiplying power of MagnaRAM?

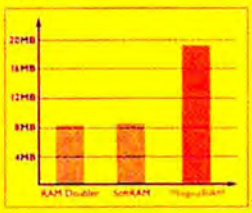
MagnaRAM doesn't double. It multiplies. It takes your physical memory and compresses it until you have maximum memory. And it combines this ultra-safe compression technology with a proprietary method for improving virtual memory speed.

It's a good combination because it means you have more usable memory for Windows® 95 and Windows 3.1. You can open more and bigger programs without getting that annoying little "out of memory" box. And because you don't go to the disk as often, the programs run much faster.

The proof is charted on a simple, graphical screen. If you want to see how much your system's memory and performance has improved, you can easily find out.

If you want to fine-tune speed and memory, you can do that, too. MagnaRAM is fully configurable.

It's all very simple. There are no chips to install, no technicians to pay. You can install it in seconds, and it runs in the background.



Best of all, MagnaRAM costs a lot less than you'd pay for RAM chips or SIMM modules.

To find out more, see your retailer, visit our website at www.qdeck.com, or give us a call at 1-800-683-6696.

(No cute little puppies were harmed in the making of this ad.)

Circle 190 on reader service card

*Test was performed using an HP Vectra 486s/33XM, 16 MB RAM, running Windows 3.1, Solidarity, Microsoft Works, Lotus 1-2-3, MS-DOS, Shoot Video Light, Corel Draw 5.0, Adobe Photoshop, VidGrid, and Corel Chart. Test conducted with products available at the time.

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From Apple to Zeos: Rating Today's PCs

What's your idea of a dream PC? Would it include a Pentium processor? Windows 95? A quad-speed CD-ROM drive with hi-fi speakers? All the latest bells and whistles are great, but when it comes right down to it, we all want something much more basic: a computer that runs. And runs. And runs. From the day you take it out of the box until the day you buy a replacement. That means no annoying incompatibilities when you try to install a new CD-ROM title, no hard drive failures when you're burning the midnight oil, and no catastrophic component failures just after the warranty expires.

In this update of our reliability and service rankings, we rate 22 computer companies, based on approximately 19,800 questionnaires returned to *PC World* in the first half of 1995.

First, though, some overall stats. As with our last report ("Reliability and Service: Boom or Bust?" June), slightly more than half of all respondents reported one or more problems with their desktop PCs. Roughly 11 percent of all respondents' PCs had one or more components dead on arrival (DOA). Wait times for customers needing service were equally distressing. On average, respondents said it took over 30 hours to reach a person who was able to help them with their problem, compared to an average wait of 25 hours in our last report. The 70 percent of respondents who say they would buy another PC from the same company, based on the service and support they received, has not changed since our last report.

THE WAIT IS OVER, says Linda Bernstein, who got through to Gateway on the second ring.

At the top of our charts are some longtime reliability and service leaders—Apple, Compaq, and Hewlett-Packard. IBM, which dropped to the second tier in our June 1995 report, is back on top. Micron rounds out the list of companies offering the most reliable PCs and the best service, with steady improvements in reliability that have landed it in the top tier. Digital, which has bounced around within the top two tiers, has dropped to the second level again.

At the other end of the spectrum, the big news is Zeos, which seems to be in a free fall, dropping to the bottom of our overall rankings. This former mail-order powerhouse was in the second tier of the overall ratings in our initial report on reliability and service in June 1994. Since then, its performance has dropped steadily.

The picture's brighter for competitor Gateway 2000. Last

SHONNA VALESKA

Winners and Losers

With this report, Micron Computer, the fast-growing mail-order firm based in Nampa, Idaho, jumps into the Best category in our Overall rankings. IBM also moves back into the top tier, after a drop in our previous report. Apple, Compaq, and Hewlett-Packard all retain their spots in the Best category overall, but only Apple and Compaq also land in the top tier in the individual rankings for Reliability and Service.

Source: PC World Reliability and Service Monitor, based on questionnaires returned between January and July 1995. See following pages for complete methodology.

OVERALL	RELIABILITY	SERVICE
BEST	**BEST**	**BEST**
Apple	Apple (168 responses)	Apple (37)
Compaq	Compaq (1361)	Compaq (337)
Hewlett-Packard	Digital (197)	IBM (361)
IBM	Hewlett-Packard (248)	**GOOD**
Micron	Micron (587)	Dell (457)
GOOD	**GOOD**	DTK (33)
AST Research	AST Research (502)	Hewlett-Packard (69)
Dell	Dell (1617)	Micron (150)
Digital	DTK (104)	Pionex (70)
DTK	IBM (1307)	**FAIR**
NEC	NEC (146)	AST Research (134)
FAIR	**FAIR**	Compudyne (60)
Acer	Acer (496)	Digital (51)
Compudyne	ExpoTech (118)	Midwest Micro (70)
ExpoTech	Gateway 2000 (3311)	NEC (42)
Gateway 2000	Leading Edge (187)	**POOR**
Leading Edge	Packard Bell (1775)	Acer (179)
Pionex	**POOR**	ExpoTech (40)
POOR	Compudyne (189)	Gateway 2000 (1071)
Midwest Micro	Pionex (163)	Leading Edge (69)
Packard Bell	Quantex (545)	Quantex (219)
Quantex	Zeos (592)	**WORST**
WORST	**WORST**	Comtrade (46)
Comtrade	Comtrade (144)	Insight (45)
Insight	Insight (106)	Packard Bell (613)
Zeos	Midwest Micro (173)	Zeos (205)

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April the company opened a second support center in Kansas City, Kansas, which now boasts an estimated 1000 staffers. Other improvements, according to Al Giazzon, Gateway's director of marketing, include a new phone system (with a fax-back option), as well as software tools to expedite problem diagnosis. A month-by-month analysis of hold times and repair times shows that Gateway's efforts to improve service are paying off (though these changes have not been in place long enough to affect the company's overall service score). In January of this year, hold times among our respondents averaged 14 minutes. By July, the hold times were down to 8 minutes. And repair times have fallen dramatically.

"Things are so completely different from just a year ago," says Linda Bernstein, a writer in New York City. When the power supply on her 486 failed last June she called tech support and braced herself for a long wait. "I dialed the phone and put it on the speaker. I was on the other side of the room, expecting to wait half an hour on hold, when they answered," she recalls. And the quality of the service? "They were wonderful," says Bernstein.

A month-by-month analysis of hold times and repair times shows that Gateway's efforts to improve service are paying off. Both have dropped dramatically.

Like Gateway, Packard Bell is looking to both people and technology to solve its problems. Besides adding staff, Packard Bell is scheduled to go online with a new phone system and new diagnostic tools for its technical support staff. Stay tuned for our next report—in March, 1996—to see if the investment pays off.

—Roberta Furger

First 8X CD-ROM Drive Doesn't Live Up to Its Name

Here we go again! Six months after we reviewed the first 6X CD-ROM drives, an 8X CD-ROM drive has hit the shelves—but this time we're not impressed. The Diamond 8X IDE-interface drive is part of the company's $599 Ultra Kit 8000 multimedia upgrade package, which includes a 16-bit Sound Blaster–compatible sound card, a pair of Yamaha stereo speakers, and a handful of CD-ROMs. In theory, the drive should run at a data transfer rate of 1200 kilobytes per second, or eight times faster than the standard rate of the first CD-ROM drives and a third faster than a 6X drive. In our tests, the device ran more like a 4X drive. Pricewise, the kit was no bargain either.

The drive *can* transfer data at 1200 K/sec, but in tests it only occasionally reaches that speed. Its sustained transfer rate was considerably slower than a Plextor SCSI-based 6PleX 6X drive that we tested, which sells by itself for about $50 more than the Diamond kit. Not surprisingly, tests of software installation and database searches—two tasks that are usually improved by high data transfer rates—repeatedly showed that Diamond's drive didn't come close to full-fledged 8X performance. And its average access time was an unacceptably slow 259 milliseconds. By comparison, the Plextor drive has an average access time of 144 ms.

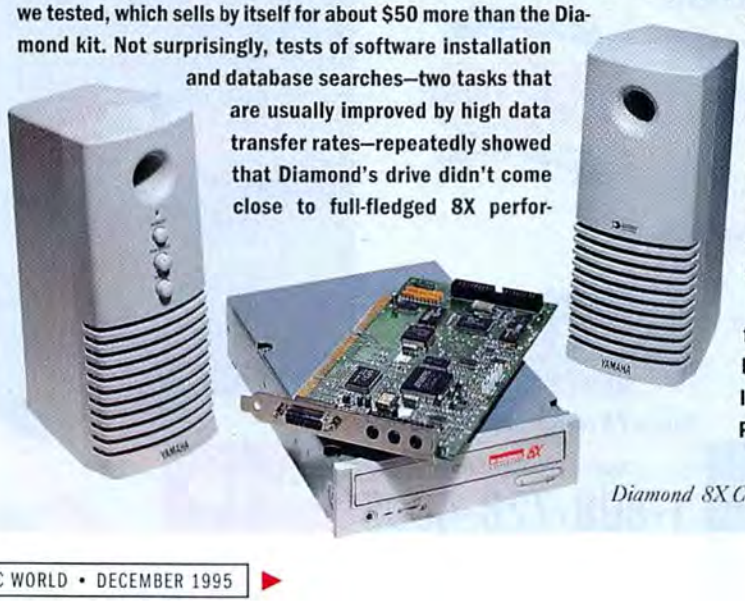
In addition, our tests showed that Diamond's drive placed a relatively high load on the CPU. That's another factor limiting its performance numbers, especially in multimedia applications. Multimedia users beware: High-speed drives may do little to improve the performance of multimedia titles because those discs are typically recorded, and played back, at 2X speeds. As usual in the PC business, software lags the hardware.

So what's Diamond up to? Ted Pine, chair of market research firm InfoTech, says it's a "specsmanship war," with Diamond "going for it" to differentiate itself in an ultracompetitive market. And competition is heating up. As we went to press, Turtle Beach started shipping an 8X CD-ROM drive. Plextor expects to an offer 8X drive some time in 1996.

The specsmanship war won't end there: Some pundits think 10X and 12X drives are in the cards for late 1996. In the longer term, the solution is expected to be faster Digital Video Disk drives, with media holding almost 5GB of data as opposed to the 680MB maximum on current CD-ROMs. But don't wait—they probably won't be available until Christmas next year.

Meanwhile, the Diamond Ultra Kit 8000 is expensive for its so-so performance. If you're willing to spend that kind of money to get a fast CD-ROM drive, put out a little more for a SCSI-based 6X drive like those from Plextor or NEC. Diamond Multimedia Systems, Inc., 800/468-5846 Reader service no. 886

—Stan Miastkowski



Diamond 8X CD-ROM

JOHN GREENLEIGH

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Reliability and Service: Best to Worst

Problem rate

System DOA rate

Component DOA rate

Time to talk

Time to resolve

Unresolved problems

Buy again based on service

Low satisfaction

High satisfaction

★★★★★ BEST									
Apple Top of the charts in most categories.	★★★★★★	★★★★★★	★★★★★★	★★★★★★	★★★★★★	★★★★★★	★★★★★★	★★★★★	★★★★★
Compaq Superb service and reliability.	★★★★★	★★★★★★	★★★★★★	★★★★★	★★★★★	★★★★★	★★★★★★	★★★★★	★★★★★
Hewlett-Packard Reliable PCs backed by good service.	★★★★★	★★★★★★	★★★★★	★★★★★	★★★★★★	★★★★	★★★★★★	★★★★★★	★★★★
IBM Higher-than-expected problem rate and unresolved problems are Big Blue's only weak points.	★★★★	★★★★★★	★★★★★	★★★★★★	★★★★★★	★★★★	★★★★★★	★★★★★	★★★★★
Micron Steady improvements in reliability move Micron into the top tier.	★★★★★★	★★★★★	★★★★★	★★★★★	★★★★★	★★★★	★★★★★★	★★★★★	★★★★★★

★★★★ GOOD									
AST Research An increase in unresolved problems mars otherwise solid scores.	★★★★	★★★★★★	★★★★★	★★★★★	★★★★★	★★★	★★★★★	★★★★	★★★★
Dell Service could be faster, but customers keep coming back for more.	★★★★★	★★★★	★★★★★	★★★★	★★★★	★★★★★	★★★★★★	★★★★★	★★★★★★
Digital Stumbles a bit on service, but customers say they'll buy again.	★★★★★	★★★★★★	★★★★	★★★	★★★★★	★★★	★★★★★★	★★★★★	★★★★★
DTK Minuscule system DOA rate and few unresolved problems boost an otherwise so-so company.	★★★★	★★★★★★	★★★★	★★★★	★★★★	★★★★★★	★★★★	★★★★	★★★★★
NEC Strong in reliability, but slow service causes customer satisfaction to plummet.	★★★★★	★★★★★	★★★★	★★★	★★★	★★★★★	★★★★★	★★★★	★★★

Methodology

The Reliability and Service Monitor is a questionnaire bound into every issue of PC World. The rankings and scores presented in this article were generated from the results of approximately 19,800 questionnaires returned to PC World between January and July, 1995.

Because the Reliability and Service Monitor is not a random-sample questionnaire, its results are not statistically projectable either to the larger base of PC World readers or to PC owners in general. However, because the questionnaire is not inherently biased in favor of any particular brand, it does provide valuable insight into relative differences among companies reported on here.

We limit our reporting to companies about whom we have received at least 100 usable questionnaires. We also limit our discussion to PCs that were purchased after January 1993 to focus our analysis on contemporary systems and service experiences.

The Star System

Stars correspond to companies' relative rankings generated from raw scores in individual categories. Following are the actual ranges of raw scores in each of the nine categories.

PROBLEM RATE: The percentage of respondents reporting one or more non-DOA problems. Five stars: 33 to 35 percent. Four stars: 37 to 40 percent. Three stars: 42 to 45 percent. Two stars: 46 to 50 percent. One star: 52 to 55 percent.

SYSTEM DOA RATE: The percentage of all questionnaire respondents who reported one or more of the following computer components DOA: hard drive, motherboard, CPU, or power supply. Five stars: 1.0 to 1.8 percent. Four stars: 2.5 to 2.9 percent. Three stars: 3.3 to 3.4 percent. Two stars: 4.2 to 5.6 percent. One star: 8.1 to 10.4 percent.

COMPONENT DOA RATE: The percentage of respondents who reported one or more "non-system-level" components dead on arrival. Five stars: 3.0 to 4.6 percent. Four stars: 5.0 to 6.1 percent. Three stars: 6.7 to 7.5 percent. Two stars: 8.3 percent. One star: 10.2 to 16.0 percent.

TIME TO TALK: How long it took for respondents reporting problems to reach a support staffer who could help them. Five stars: 12 to 15 hours. Four stars: 18 to 22 hours. Three stars: 26 hours. Two stars: 30 to 40 hours. One star: 46 to 58 hours.

TIME TO RESOLVE: How long it took to repair the problems reported by respondents. Five stars: 4½ to 7 days. Four stars: 7¾ to 8 days. Three stars: 8¾ to 9¾

★★★ FAIR									
Acer High problem rate and slow service.	★★	★★★★	★★	★★★	★★	★★	★★★	★★★	★★★
Compudyne Fast service can't quite compensate for high problem rate.	★	★★	★★★	★★★★★	★★★★	★★★★	★★	★★★	★
ExpoTech Lots of problems and slow on the phones.	★★	★★★★	★	★	★★★	★★★	★★	★★★	★★★
Gateway 2000 Service problems early in the year, although fixed, keep Gateway's score down.	★★	★★★★	★★★	★★	★★	★★★	★★★★	★★★	★★★
Leading Edge Low system DOA rate and few unresolved problems.	★	★★★★★	★	★★	★★	★★★★★	★★	★★★	★★
Pionex Excessive hardware problems pull down otherwise respectable scores.	★	★★★★	★	★★★★	★★★★★	★★★	★★★★	★★★	★★★

★★ POOR									
Midwest Micro Poor reliability and so-so service.	★★	★	★	★★	★★	★★★	★★★★	★★★	★★★★
Packard Bell Service woes continue.	★	★★★★	★★★★	★★	★★	★★	★★	★★	★
Quantex More problems and slower service bump this relative newcomer down a notch.	★★	★★	★	★	★★★	★★★	★★★★	★★★	★★

★ WORST									
Comtrade Some slight improvements, but still among the worst in reliability and service.	★★	★★	★	★	★★★	★★	★	★	★
Insight Phone response time is only bright spot in otherwise bleak picture.	★	★	★	★★★★	★	★★	★★	★★★	★★★
Zeos Some of the highest problem rates and the slowest at repairs.	★	★★★	★	★	★	★	★★	★★	★★

days. Two stars: 10 to 11 days. One star: 13¾ days.

UNRESOLVED PROBLEMS: The percentage of respondents reporting that their problems were never resolved. Five stars: 0.0 to 3.2 percent. Four stars: 4.7 to 5.1 percent. Three stars: 5.6 to 7.8 percent. Two stars: 10.1 to 11.1 percent. One star: 12.3 percent.

BUY AGAIN BASED ON SERVICE AND SUPPORT: The percentage of all respondents reporting problems who would buy from the company again, based on the service and support they received. Five stars: 80 to 85 percent. Four stars: 71 to 75 percent. Three stars: 66 to 69 percent. Two stars: 53 to 60 percent. One star: 46 percent.

LOW SATISFACTION: The percentage of all respondents reporting less than average satisfaction with service and support. Five stars: 13 percent. Four stars: 16 to 21 percent. Three stars: 24 to 34 percent. Two stars: 40 to 43 percent. One star: 52 percent.

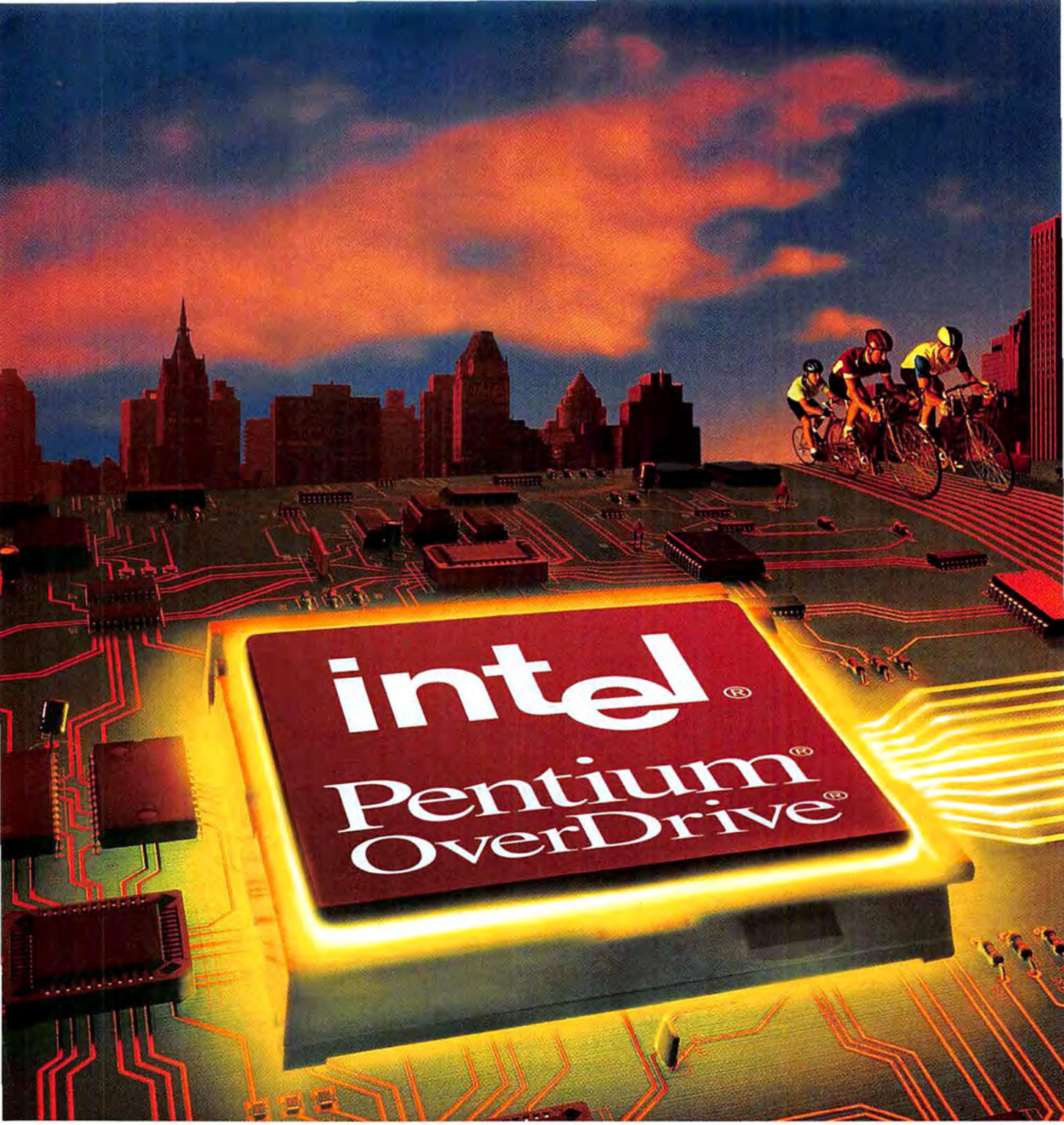
HIGH SATISFACTION: The percentage of all respondents reporting better than average satisfaction. Five stars: 61 to 63 percent. Four stars: 52 to 57 percent. Three stars: 41 to 50 percent. Two stars: 33 to 38 percent. One star: 28 to 31 percent.

Scores and Rankings

To determine the reliability ranking for each company in this report, we measured three categories: percentage of respondents who had a non-DOA problem, 50 percent weighting; percentage with a "system-level" DOA (that is, PCs that had a faulty motherboard, CPU, hard drive, or power supply right out of the box), 30 percent; and percentage reporting one or more other components DOA, 20 percent.

To determine the service ranking for each company, only respondents reporting on their service experience were counted. We measured six categories: the average time it took respondents to talk to the person who could help them, 10 percent weighting; the average time it took to resolve the problem, 20 percent; the percentage who reported their problem was never resolved, 30 percent; the percentage who would buy the same brand again based on service, 20 percent; the percentage reporting a low satisfaction with service, 10 percent; and the percentage reporting a high satisfaction with service, 10 percent.

For each of the nine service and reliability categories, we ranked companies on a scale of 1 to 5 in order to determine star ratings. We determine a company's overall ranking based on the sum of its reliability and service scores, as well as the number of stars awarded in individual categories.



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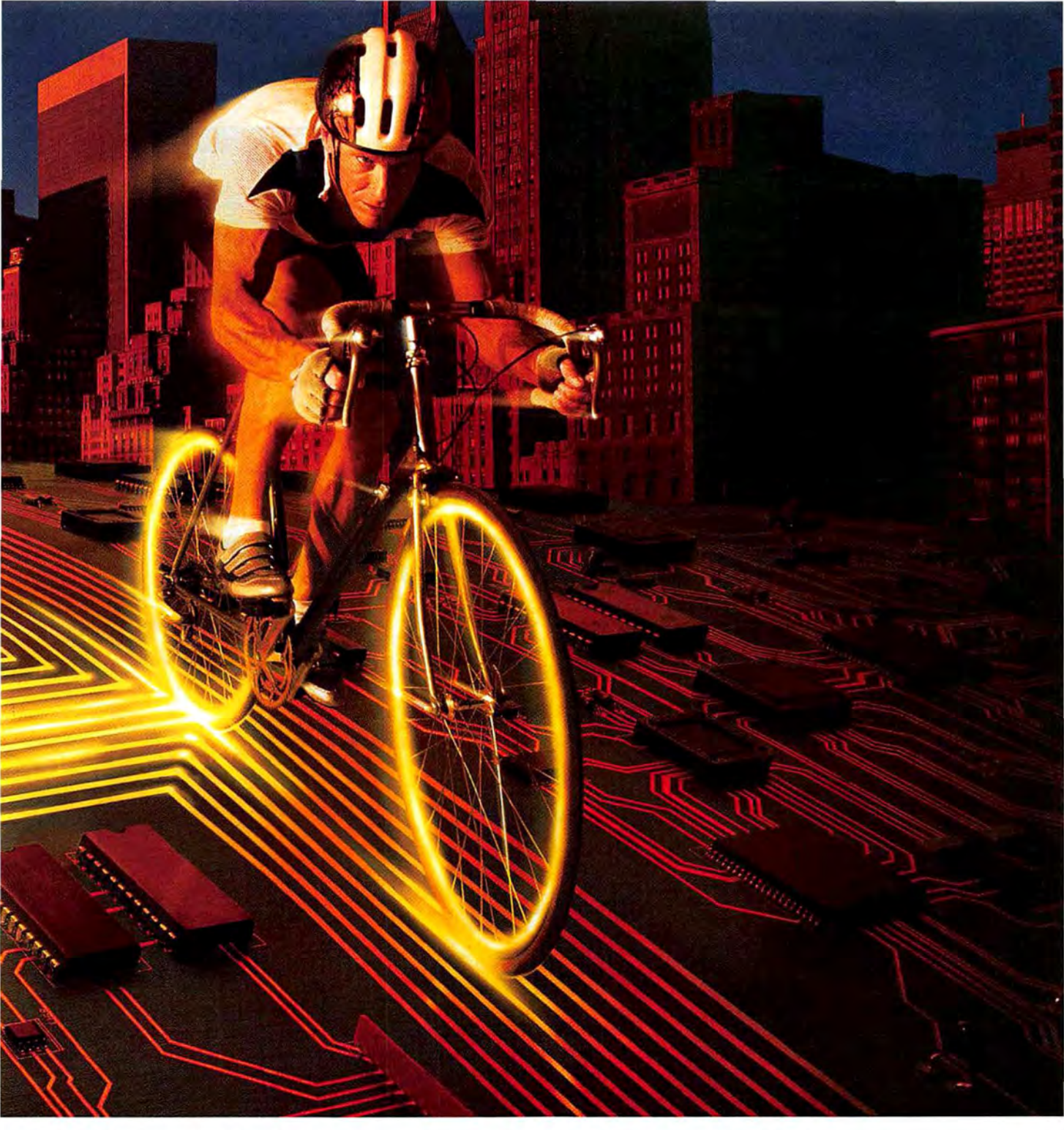

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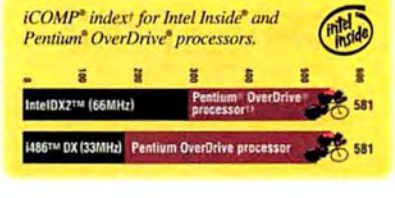

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New Notebooks Pack Desktop Power

Notebooks have come a long way in the past couple of years: They're now lighter, faster, and packed with multimedia features. Despite these improvements, many people who need the horsepower or storage of a high-end desktop have been out of luck if they required a mobile PC. Two new notebooks, the Dell Latitude XPi P120ST and the Compaq LTE 5100 810 CD CTFT, take mobile computing to a whole new level and address the needs of power users.

Pentium-120 Power

Dell is one of the first big vendors to offer a 120-MHz Pentium system at a reasonable price: $4399 for the entry model. The Latitude XPi comes with a 420MB removable hard drive, 8MB of RAM expandable to 40MB, a 256K secondary cache, and a 10.4-inch active-matrix screen. The notebook weighs just 6.2 pounds. (A competitor, IBM's ThinkPad 760C, comes with a 12.1-inch active-matrix screen, a 120-MHz Pentium CPU, and a 1.2GB hard drive—and a price tag of about $6599.)

The price alone makes the Latitude worth a close look. But the notebook also comes with standard features such as two PC Card slots that together accept two Type I or Type II cards or one Type III card. The 420MB hard drive is small by current standards, but it's removable, so when you've filled it up you can pop in a new one from Dell. Replacement hard drives range from a 420MB for $459 to a 1.2GB that costs $1259.

The Latitude XPi's lithium-ion battery lasts for between 2 and 3.3 hours, the vendor says. If you need to change the battery on the fly, the unit can handle a "warm" swap: A simple command suspends the system, sending it into sleep mode so you can safely change the battery. If you want to use the Latitude as your primary computer, you can slip it into Dell's DeskDock docking station, which can come with either an ethernet or token ring adapter. The DeskDock's price is $199; the ethernet-ready model is $299, while the token ring configuration costs about $100 more.

PLUG AND GO: The Compaq LTE 5100 810 CD CTFT is highly customizable, with hard drive upgrades and CD-ROM drive attachments at your fingertips.

Expandability and Then Some

If storage capacity is your concern, check out Compaq's new LTE 5100 810 CD CTFT, the slickest in a new five-model line of notebooks. This 90-MHz Pentium–powered PC includes an 810MB hard drive (a 1.35GB drive is also available). The $5899 model comes with a modular quad-speed CD-ROM drive that snaps in and out of the unit. Compaq gives you 8MB of RAM, but the LTE can take up to 72MB if you need it. You have a choice of either lithium-ion or less expensive nickel–metal-hydride batteries.

Many components can be swapped in and out of the LTE's front-loading slots, so you can reconfigure the notebook to meet your needs. The LTE's two modular slots will accept a CD-ROM drive, a floppy drive, a hard drive, or a battery. For example, you can pop in a second hard drive for up to 2.7GB of internal storage or use the space for a second battery to extend the notebook's life to nearly 8 hours, according to the vendor.

With the addition of a docking station, the LTE is able to function as a desktop PC. Compaq's new MultiBay Expansion Base docking station increases the LTE's storage capacity to a maximum of 5.4GB. Modular devices such as CD-ROM drives and floppy drives snap into the front of the MultiBay, and snap out just as easily. The MultiBay features an infrared port for wireless connectivity, useful for small offices that haven't installed a full network. The docking station also includes two PC Card Type III slots, integrated ethernet, and stereo speakers. Like the Dell Latitude, the LTE allows you to warm-dock it.

—Gabrielle Mitchell

Dell Latitude XPi P120ST, Compaq LTE 5100 810 CD CTFT

Two notebooks as full-featured as a desktop.

Dell Computer Corp.
800/289-3355, 512/338-4400
http://www.dell.com
Pricing: $4399
Reader service no. 767

Compaq Computer Corp.
800/345-1518
http://www.compaq.com
Pricing: $5899
Reader service no. 768

Speedy 6X Drives Make CD-ROM Searches a Snap

Did you ever wonder why they make cars that can go twice as fast as speed laws allow? It's for the same reason that CD-ROM drives can go twice as fast as today's titles require: the need for speed. When the time comes to load Microsoft Office for Windows 95 onto your computer, you can wait an hour or just 10 minutes for the software to load, depending on the speed of your CD-ROM drive.

Quad-speed drives are currently the industry standard, but at least a half-dozen manufacturers have developed or released speedier 6X CD-ROM drives to date.

Aztech Labs' contribution is the CDA 668-01I. This external CD-ROM drive is fairly easy to install if you already have an Enhanced IDE motherboard; it took me about 5 minutes. (If not, you must install Aztech's included adapter card in one of your system's free slots.)

CDA 668-01I

6X Enhanced IDE CD-ROM drive is easy to set up.
Aztech Labs, Inc.
800/886-8859
List price: $249
Reader service no. 772

XM-3701

"6.7-speed" SCSI CD-ROM drive uses little CPU power.
Toshiba America Information Systems Inc.
714/457-0777
Pricing: Not available at press time
Reader service no. 773

To get the kind of power the Toshiba XM-3701 drive offers, you'll need a SCSI card. Installing the card, setting the IRQs, and getting it all to work well took me about an hour.

In my informal testing to determine some benchmarks, I ran some of my own applications and games. I sampled Star Trek: A Final Unity from Spectrum HoloByte and Sierra On-Line's Space Quest 6 because both titles test your drive's speed before they run. In addition, I used Phantasmagoria (also from Sierra On-Line) to check the difference in video streaming between my 4X Mitsumi drive and the 6X Aztech and Toshiba drives.

I found that the Aztech was nearly twice as fast as my Mitsumi quad-speed drive. Files loaded a few seconds faster from the Toshiba, but that was mainly with smaller applications. Video sequences ran noticeably faster and smoother on both of the 6X drives. Searches are also quicker on the 6X drives: It took me just seconds to search an address CD-ROM for all the Mooneys in Washington state.

The downside to the Aztech CDA 668-01I is that it requires a lot of CPU processing power, which is a drain on your system resources if you're trying to multitask.

Toshiba says the XM-3701 is a "6.7-speed" drive that breaks the 1MB-per-second barrier with a sustained transfer rate of 1043 K/sec. When I ran the same titles on the Toshiba and the Aztech, the Toshiba was quicker. And, unlike the Aztech drive, the Toshiba uses little CPU processing power.

If you want a simple set-up, the Aztech drive is a good choice. But if you don't mind spending extra time on a more powerful drive, the Toshiba is a better bet.

—Shane Mooney

SIMPLY SATISFYING: Toshiba's zippy, powerful XM-3701 CD-ROM drive comes in both internal and external versions.

Handy New Pointing Device

A lot of mice enter your office and home uninvited, tagging along with new PCs. Because you may use a pointing device for hours every day—more time than you spend with your carefully chosen exercise shoes—it's important to use one that's comfortable. I tried out the Felix, an alternative to traditional mice. It has its advantages over conventional mice, but ultimately you'll have to compare, then decide what's right for you.

The $69 Felix is less than an inch thick and has a U-shaped base that sits flat on your desk (though I was more comfortable when I used a wrist rest). On top is a 1-inch-square digitizing tablet covered by a flat, oval device with two click buttons. Using your fingers, you slide the stopwatch-size oval around to navigate on screen: The Felix's optical-encoder technology maps your movement from the tablet and moves the pointer. The manufacturer says you need to use only your fingers to slide the oval, but I sometimes found myself wiggling my wrist left and right to make it move. You can pick up the device and use it in your lap, which may appeal to gamers and Net surfers.

The Felix uses Microsoft Mouse drivers. It's currently available in a serial port version only; a PS/2 version is expected by the end of November.

—Laurianne McLaughlin

Felix

Flat device uses motion similar to a trackball's.
Altra
800/726-6153
Street price: $69
Reader service no. 774

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Software Bolsters Backup Drives Under Windows 95

Hard drive crashes are like opinions: Everyone has them. But you can minimize the effect of a crash if you regularly back up your hard drive. Your backup drive, however, is only as good as the software that supports it.

Windows 95 comes with a backup utility, but the applet lacks many basic features, such as support for unattended operation. Two software products from Conner and HP Colorado, though, extend the applet's capabilities and your backup drive's usefulness.

HP Colorado designed Windows 95's backup applet, so it's not surprising that the interface of Colorado Backup for Windows 95 is similar. But along with basic functions such as formatting and erasing tapes, you get a scheduler for automatic, unattended backups, as well as features for unerasing, renaming, and retensioning tapes. Windows 95 users can download Colorado Backup for free from the company's BBS at 970/635-0650 or by FTP at **col.hp.com/dist/hp-colorado**. Shipping and handling costs $7.95 if you order it by phone.

I tried the software with HP Colorado's new backup unit, the T1000. This internal Travan drive plugged right into my floppy controller and fits in either a 3½-inch or 5¼-inch drive bay. It retails for $218, which includes an 800MB cartridge. The software also supports most Colorado QIC tape drives, the PowerTape family, and the HP SureStore line of digital audiotape drives.

Backup Exec for Windows 95, from Conner Tape Products Group, can multithread and multitask to quickly back up your hard drive. For novices, the $49.95 software comes with Wizards for step-by-step operation. It includes a scheduler for unattended operation, as well as support for Plug and Play to make installation a breeze.

Conner's new Tape-Stor 3200 comes with Backup Exec for Windows 95 and a 3.2GB compressed cartridge. This $329 Travan tape backup device can use 1.6GB cartridges as well. It's also compatible with Irwin AccuTrak-250 and Sony QIC-Wide tape cartridges. Backup Exec supports parallel, floppy, SCSI, QIC-Wide, and Travan tape devices.

If you're considering a hardware-software combination, the Conner's easy setup makes it a better choice.

–Shane Mooney

HP Colorado T1000 (with Colorado Backup for Windows 95), Tape-Stor 3200 (with Backup Exec for Windows 95)

Big backup drives with feature-rich apps.

HP Colorado
800/810-0133 (hardware), 800/416-8596 (software)
Pricing: T1000 $218, Colorado Backup $7.95 (free download)
Reader service no. 769

Conner Tape Products Group
800/531-0968
Pricing: Tape-Stor 3200 $329, Backup Exec $49.95
Reader service no. 770

DATA SAFE: Conner's Tape-Stor 3200 Travan tape backup drive comes with a copy of Backup Exec for Windows 95.

Quick-and-Dirty Backup

While everyone knows the importance of backing up your hard drive, it's easy to put it off. Tape backup systems can be costly, and installing them can be difficult.

Iomega's Ditto Easy 800 takes a lot of the pain out of doing backups. Not only is this tape backup drive's $149.95 street price about half that of comparable units, but the device also plugs easily into your parallel port (with pass-through capability for your printer).

The Ditto Easy can back up 800MB of uncompressed data. And it supports all the leading QIC tape formats, including Travan and QIC-Wide.

The Ditto Easy's niftiest feature is what Iomega calls "1-Step" software: The program's icon resides on the Windows 95 taskbar; one click and the Ditto Easy backs up your data. The drive is preset to back up every 8 hours, so if you forget to perform a backup manually, your data is still safe.

Even though the Ditto Easy is a parallel port device, it has all the same utilities—such as tape retensioning—as higher-priced models, but at a price that won't break the bank. Geared toward the small-office and home user, this external drive is fully compatible with Windows 95 and also works with Windows 3.*x*, OS/2, DOS, Novell NetWare, and LANtastic operating environments.

–Shane Mooney

Ditto Easy 800

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Iomega
800/697-8833, 801/778-1000
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Circle 30 on reader service card

PageMaker Gains Ground, Publisher Easier Than Ever in Windows 95

The Windows 95 versions of the two top desktop publishing programs continue the tradition established with earlier releases. Microsoft Publisher is the best choice for desktop publishing novices and most home and small-business users. Adobe PageMaker, however, is a solid choice for those who frequently produce professional documents requiring higher-end typographic and color capabilities.

I looked at the shipping version of Microsoft Publisher CD Deluxe for Windows 95 and a late beta of Adobe PageMaker 6.0. I was impressed by both products. Each is fully compliant with Windows 95, includes some nifty feature enhancements, and is worth the upgrade price.

Publisher: Simpler to Use

Microsoft Publisher offers improved PageWizards—groundbreaking, step-by-step guides that walk you through the process of creating professional-looking brochures, business cards, letterhead, newsletters, and similar items.

The 16 included PageWizards—each for a different type of document—now provide more design variations. In the previous version of Publisher, for instance, you could choose only the Jazzy, Modern, or Classic newsletter designs. In the new version, you have these choices along with Art Deco, Watercolor, Headline, School News, and two Holiday options. Also new is the Design Gallery, which provides hundreds of designs for headlines, pull quotes, sidebars, and other page elements you can use with any document.

Advanced users will appreciate the new "gamut" alarm feature, which warns you if a color you select will not output properly on your printer. And unlike PageMaker, Publisher lets you create stylish color gradients from within the program.

Publisher comes with more than 1000 well-designed clip art images (up from 125 in the previous version). You can now rotate both graphics and text to any angle—an omission in the previous version that posed a serious limitation.

Despite these enhancements, Publisher is still no PageMaker. It lacks precise typographic controls and tools for creating color separations, tables of contents, and indexes.

PageMaker Gains on Quark

The latest PageMaker adds more than 50 new features while retaining the "artist's pasteboard" interface that won popularity among graphic designers when it was introduced in 1985. Though it's since lost ground to QuarkXPress, this new version helps PageMaker regain some of that turf. And, while it's compliant with Windows 95, PageMaker still runs under Windows 3.1.

PageMaker is now tightly integrated with Adobe's other graphics packages—Photoshop and Illustrator—so you can do minor image editing within the program. You can, for instance, import Kodak Photo CD images and alter them in eye-catching ways using Photoshop-compatible filters.

Adobe has also improved PageMaker's color publishing tools. PageMaker now supports the Kodak Precision Color Management System, which ensures that the correct colors print out. PageMaker also supports the Pantone Hexachrome libraries, which help you choose the right colors in the first place.

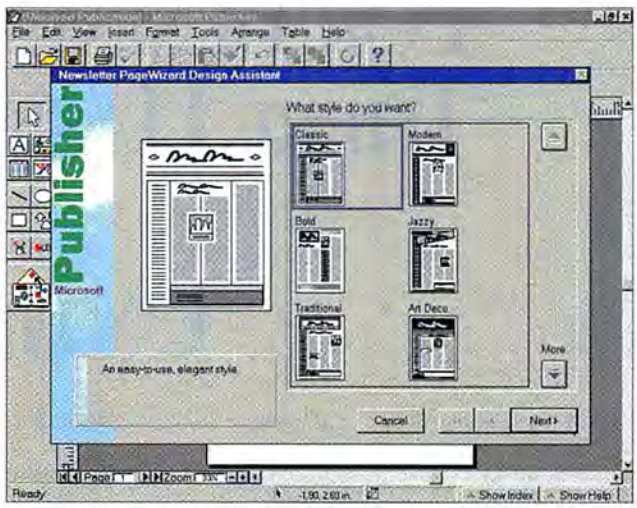
The new version includes cool tools for distributing documents over the Internet or corporate networks. Using Plug-ins (formerly called Additions), you can now save a PageMaker document as either a Hypertext Markup Language or Adobe .pdf file.

Like QuarkXPress, PageMaker allows multiple master pages, which are useful for imparting a consistent look to different sections of a document. But PageMaker's master pages are limited to a maximum of two pages per set, which can restrict your flexibility.

Other beefs: The table editor, dropped in version 5.0, is back—and it's still clunky. And it would be nice to be able to drag and drop text within sentences and paragraphs, as you can with Quark.

All in all, PageMaker 6.0 may not have what it takes to bring in Quark users, but it has what it needs to keep PageMaker fans in the fold.

—Reid Goldsborough



HOLDING YOUR HAND: Microsoft Publisher beefs up its best feature—PageWizards, templates that automate design.

Microsoft Publisher CD Deluxe for Windows 95

Reigning DTP package for small business and home.
Microsoft
800/426-9400, 206/882-8080
Street price: $79.95
Reader service no. 679

Adobe PageMaker 6.0

New features for high-end publishing.
Adobe Systems
800/422-3623, 206/622-5500
List price: $895
Reader service no. 680

(THAT'S IN THE PIPELINE. MEANWHILE, YOU WON'T FIND A FAX PROGRAM MORE ADVANCED THAN NEW DELRINA WINFAX PRO 7.0 FOR WINDOWS 95.)

Alas, Delrina developers still haven't figured out how to fax into someone's brain after 11 P.M. (when rates are lower) without waking him or her up. Fortunately, their latest release – new Delrina WinFax™ PRO 7.0 – is as easy and powerful as one would expect from the best-selling, most award-winning fax software in the world. It fully exploits new Windows® 95's 32-bit multi-tasking, multi-threading talents for true background faxing, greater speed and more. But it doesn't stop there. With the new TalkWorks™ telephony option and your voice modem, WinFax PRO 7.0 turns your computer into an integrated in-box for faxes, e-mail and voice mail. It even takes phone messages, distinguishes between fax and voice calls, has fax on demand and identifies callers before you pick up. And there's more. Built-in compression cuts fax transmission time (and phone bills) by up to one-third. It now supports gray-scale faxing, integrates with Microsoft® Exchange, and includes OCR, 101 ready-to-use fax cover sheets and tools to design your own. You can even get WinFax PRO as part of new Delrina CommSuite™ 95, the complete, affordable, integrated communications software solution for Windows 95. All of which should suffice until the new alpha wave faxing program is ready. (Hmm. Perhaps if we *partition* your brain so that one half can receive faxes while the other remains undisturbed...)

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Std./Max. Memory	8MB/136MB	8MB/136MB	16MB/192MB	16MB/192MB
Hard Drive	630MB or 1GB	630MB or 1GB	630MB or 1GB	1GB
Cache Internal	16KB	16KB	16KB	16KB
Cache External	256KB (optional)	256KB (optional)	256KB	256KB
Architecture	PCI	PCI	TriFlex/PCI	TriFlex/PCI
Video Memory/Max.	1MB/2MB	1MB/2MB	1MB/2MB	1MB/2MB
Compaq 150 Color Monitor	Yes	Yes	Yes	Yes
Diskette Drive	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB	3.5" 1.44MB
Expansion Slots (Total)	3	3	4	5
Drive Bays (Total)	3	3	4	5
Ports: Serial/Parallel	1/1 (ECP)	1/1 (ECP)	1/1 (ECP)	1/1 (ECP)
Security Features	Yes	Yes	Yes	Yes
Processor Upgradable	Yes	Yes	Yes	Yes
101-Key Keyboard, Mouse	Yes	Yes	Yes	Yes
Software Preinstalled (Choice of)	MS-Windows® 95 or MS-Windows 3.1	MS-Windows 95 or MS-Windows 3.1	MS-Windows 95 or MS-Windows 3.1	MS-Windows 95 or MS-Windows 3.1
Energy Star Compliant	Yes	Yes	Yes	Yes
Limited Warranty*	3-Year	3-Year	3-Year	3-Year
Price†				
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Antivirus Software Targets Multiple Platforms and Thousands of Viruses

The word *virus* can cause panic in any computer user. It's not mere paranoia: Viruses do exist. There were more than 6900 at last count, and experts say that three to five new ones are created every day. Antivirus software developers are in a perpetual race to keep up with the virus creators. I looked at three contenders' multiplatform products: S&S Software's Dr. Solomon's Anti-Virus Toolkit 7.5, IBM Anti-Virus 2.2, and McAfee's VirusScan for Windows 95. (Norton Anti-Virus, which isn't discussed here, works only under DOS and Windows 3.*x*.) Antivirus programs basically work the same: After scanning the hard disk boot sector on start-up and scanning memory for viruses, these system watchdogs work in the background, checking for viruses at user-defined intervals. But each of these products has a unique method of virus detection.

Dr. Solomon's Anti-Virus Toolkit 7.5

Bells and whistles plus years of experience.
S&S Software Int'l
800/701-9648, 617/273-7400
http://www.drsolomon.com
List price: $125
Reader service no. 681

IBM AntiVirus 2.2

Slick technology, but a weak interface and no Windows 95 support.
IBM
800/742-2493
http://www.brs.ibm.com/ibmav.html
List price: $49

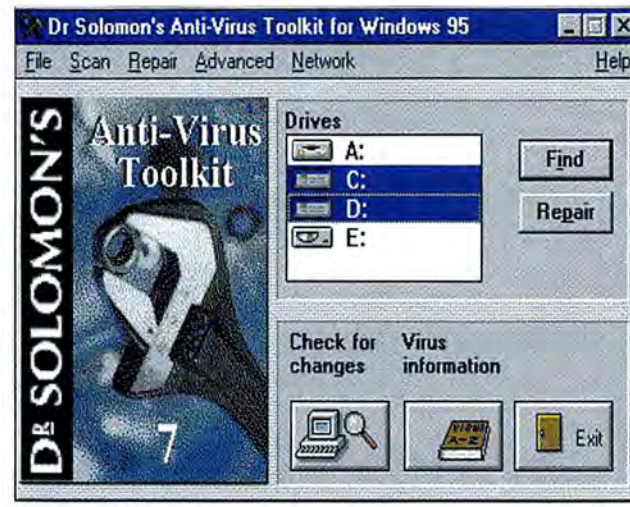
VirusScan for Windows 95

Fastest and slickest of the three packages.
McAfee
408/988-3832
http://www.mcafee.com
List price: $65
Reader service no. 682

Dr. Solomon's: More Than Ten Years of Experience

Based in the United Kingdom, S&S Software has been battling viruses since 1984. At $125, S&S's Dr. Solomon's Anti-Virus Toolkit 7.5 is the most expensive of the pack. But you're paying for the vendor's years of experience, along with a few bells and whistles such as an extensive online encyclopedia of known viruses that provides detailed information on specific varieties—how they work and what kind of damage they can cause. This version checked for 6809 different viruses and actually found one on my system. The interface is well designed and straightforward.

Dr. Solomon's is available in several versions, offering protection for DOS, OS/2, NetWare, and all releases of Windows. (I tested the Windows 95 beta version.) The heart of the program is *Advanced Heuristic Analysis:* Instead of just looking for the unique binary signatures of known viruses, AHA seeks out suspicious code and programming techniques that may indicate a virus. This isn't as easy as it sounds, because code that may be innocent in one program could be malignant in another. The software, though, does not attack code without notifying the user.



DR. SOLOMON'S ANTI-VIRUS TOOLKIT includes an encyclopedia that covers everything you ever need to know about viruses.

IBM AntiVirus: Weak Interface

IBM's antivirus package does not include support for Windows 95—but the company says it will in 1996. I tested version 2.2, which has DOS, Windows, and OS/2 support in one $49 package. On my dual-boot Windows-OS/2 system, AntiVirus used different interfaces but a single core engine for both operating systems.

In addition to checking for specific viruses, the product ferrets out new ones based on their behavior, according to IBM. AntiVirus has cutting-edge technology, but its installation is a bit esoteric, and the interface looks as if IBM spent about 20 minutes developing it. But once the program is up and running, you can pretty much forget about it, because there's obviously a great deal of technology and protection behind its plain interface.

McAfee's VirusScan: The Market Leader

McAfee is plainly the 500-pound gorilla of antivirus software developers. Industry analysts say that the company holds more than 75 percent of the market. In addition to offering a commercial version, McAfee still distributes VirusScan as shareware (both versions cost $65). It is available for DOS, OS/2, NetWare, and all versions of Windows; I tested the Windows 95 version.

The program integrates with Windows 95's Explorer so you can launch VirusScan by right-clicking a folder, a drive, or a program icon. Another thing that sets the package apart is its speed in manual scans—it's by far the fastest of the three.

For many people, choosing an antivirus product depends on the interface they prefer. Of these three products, I liked Dr. Solomon's because of the company's decade-long experience with combating viruses.

—Stan Miastkowski

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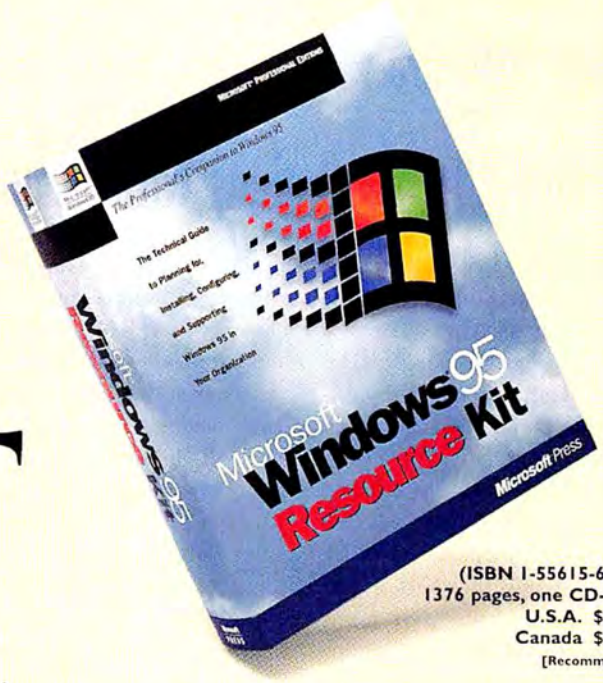

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Weigh All Your Options With DecideRight for Windows

If you sometimes feel as irresolute as a character in a Woody Allen movie, Avantos Performance Systems' $99 DecideRight can help. This inexpensive 16-bit program, which runs under both Windows 95 and Windows 3.1, can help you make up your mind—whether you're trying to decide which car to buy or whether you should upgrade your staff's computers to Windows 95.

Although DecideRight offers a couple of ways to build a decision matrix, I found Quick Build to be a painless six-step process that lets you complete one screen at a time and edit the screens later.

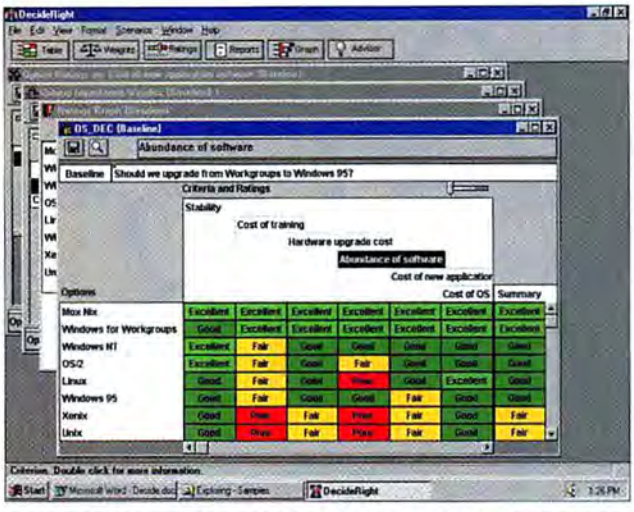
First, you tell DecideRight the decision you need to make. Suppose you're making the Windows 95 upgrade decision. Enter your options, including other available operating systems. Then enter your criteria, such as stability and training, and costs for new hardware.

You weigh each criterion by importance and rate your options as excellent, good, fair, or poor. You can assign numerical values if you want to be more precise. You can always add more options, import text summaries, and change the criteria, weights, or ratings. You can also view what-if scenarios without changing your original model.

Once you enter—and perhaps revise—all the options and criteria on your decision, you (or even Woody) can easily make intelligent decisions with DecideRight. In this example, you're better off sticking with Windows NT, for now at least.

DecideRight includes some context-sensitive help functions and an on-screen adviser that weren't functional in the beta I tested. When these features are implemented in the final release, DecideRight should be even easier to use.

–Joe Peschel



DECISIONS, DECISIONS: DecideRight helps you analyze situations, make decisions, and examine what-if scenarios.

DecideRight for Windows

Inexpensive decision builder.
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800/282-6867, 510/654-4600
Street price: $99
Reader service no. 683

Off-Site, Online Meetings Get Better

Meetings may be the mainstay of business, but two new low-cost document-conferencing packages, FarSite 2.0 and LiveShare Plus, are the next best thing to being there.

DataBeam's FarSite 2.0 is designed for conducting online meetings between two PCs connected by a phone line or among multiple systems on a LAN. You can't share applications across a phone line, but a whiteboard lets participants draw or type on a screen that everyone can see. You can import and show presentations created in programs like PowerPoint, and send files to others at the same time. You can also capture screens from your other apps to share with colleagues.

At $99 per user, FarSite's basic edition is inexpensive. The $199 corporate edition adds compliance with the T.120 data-conferencing protocol, allowing users connected through a LAN in one office to hold a conference with users in another location.

For voice transmission, FarSite requires a separate phone line or Digital Simultaneous Voice/Data modems. That's where PictureTel's $249 LiveShare Plus stands apart. It contains LiveTalk, a module that adds voice to online conferences via software. LiveTalk doesn't require DSVD modems, but each user does need a sound card and at least a 9600-bps modem.

LiveShare goes beyond other document conferencing packages by offering full-fledged application sharing—for example, two people can work on an Excel worksheet at the same time. But the current version is solely for one-on-one meetings.

Both FarSite and LiveShare Plus are currently available in Windows 3.*x* versions, which the companies say will work under Windows 95. Full 32-bit Windows 95 versions are promised for 1996.

–Stan Miastkowski

FarSite 2.0

Conduct online meetings via phone or LAN.
DataBeam Corp.
606/245-3500
List price: basic edition $99, corporate edition $199
Reader service no. 684

LiveShare Plus With LiveTalk

Application sharing with voice support for any modem.
PictureTel Corp.
800/716-6000
List price: $249
Reader service no. 685

"MOST BANG FOR THE BUCK."

(BUT DON'T TAKE OUR WORD FOR IT!)

PC WORLD BEST BUY

JUNE 1995 BYTE BEST OVERALL V.34 EXTERNAL MODEM

ProClass 288 LCD V.34

New Estimated Street Price: $359

PC WORLD June 1995
BEST BUY

- "the best combination of price, performance, features, and support"... way ahead of the pack."
- "best overall value in a V.34 modem."
- "the clear Best Buy in this roundup."

BYTE/NSTL LAB REPORT June 1995
BEST OVERALL

- "top honors in almost every aspect of our benchmarks."

EDITORS' Home Office COMPUTING PICK

COMPUTERWORLD U.S. BRAND PREFERENCE 1995 BEST PRICE/PERFORMANCE

ProClass 288 MT V.34

New Estimated Street Price: $289

Practical Class 288 Mt II V.34

New Estimated Street Price: $199

HOME OFFICE COMPUTING Jan. 1995
EDITORS PICK AWARD

- "represents the cutting edge of today's telecommunications technology...and better priced."

PC MAGAZINE March 14,1995

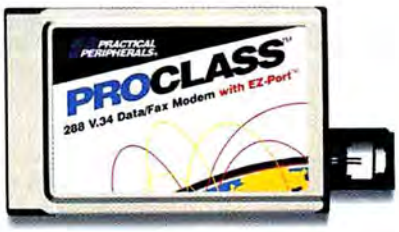
- "it's performance out distances even much more expensive modems."
- "by far a top performer overall."
- "best - performing modem."

COMPUTERWORLD U.S. BRAND PREFERENCE 1995 BEST PRICE/PERFORMANCE

JUNE 1995 BYTE BEST OVERALL V.34 PC CARD MODEM

PCWEEK LABS ANALYST'S CHOICE DEC. 26, 1994

Mobile FIRST CLASS



ProClass 288 EZ-Port™

New Estimated Street Price: $289

PC WEEK April 3, 1995
ANALYST CHOICE

- "provided the most efficient built-in power management."
- "best combination of price and performance."

BYTE/NSTL LAB REPORT June 1995
BEST OVERALL

- "the modem ran extremely well, finishing first in our PC Card fax testing."

When it comes to value, industry editors and buyers think Practical. Our latest line of high-speed modems has been capturing all the awards, making Practical an incredible value. And with 7 day technical support and a lifetime limited warranty,* you will be very satisfied. For more information on the complete line of Practical modems, call PRACTIFAX at 800-225-4774 and select Document #3010, or call 800-964-2937, Ext. 600 for a dealer referral.

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*Five year warranty on PCMCIA modems.

Circle 191 on reader service card

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COMPAQ LTE 5000

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Circle 83 on reader service card

End the Suffering: Electronic Expense Reports Made Easy

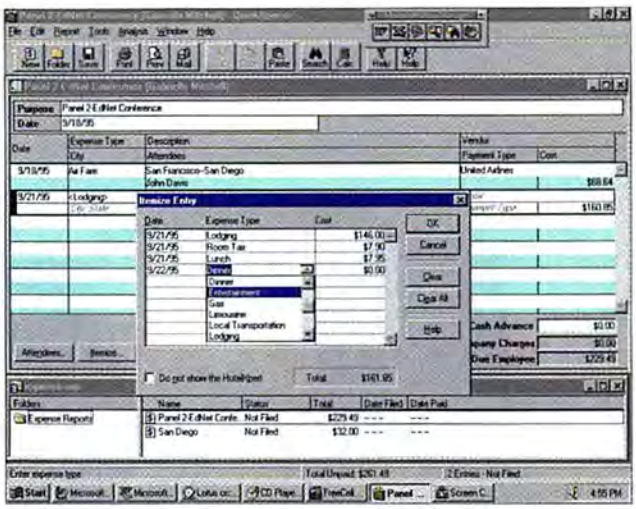
The worst part of any business trip is filling out expense reports. Many companies have developed spreadsheet templates that make filing reports less agonizing. But the process can be made painless with Portable Software's QuickXpense 1.6 for Windows 95, an easy-to-learn program that lets you exchange information with other applications.

QuickXpense's checkbook approach resembles a standard spreadsheet but is easier to use because it doesn't require you to repeatedly enter the same information, such as the names of hotels and restaurants. QuickXpense comes equipped with drop-down menus that list common airlines, hotels, and service stations, among other things. If you enter a favorite hotel that isn't already in its lists, QuickXpense adds it to the drop-down menus.

QuickXpense offers a number of advantages over a competing product, Quicken's ExpensAble (see the review in this month's *@Home* section). QuickXpense is designed for Windows 95 and takes advantage of functions such as drag and drop. It also includes an XpenseLink feature that lets you download credit card charges from a BBS. (At press time, only GE Capital Corporate MasterCard customers could take advantage of this feature.)

QuickXpense includes 35 modifiable expense report templates (ExpensAble includes 20). If your company insists on using its own expense report forms, Portable Software can create a comparable template for $99.95 (free if you purchase three or more copies of the software).

—Gabrielle Mitchell



BILLING BREAKDOWN: Hotel receipts are a snap to itemize with QuickXpense's HotelXpense feature.

QuickXpense 1.6 for Windows 95

Robust expense reporting with several unique features for Windows 95.
Portable Software
800/478-7411, 206/637-8808
Street price: $69.95, upgrade $29.95
Reader service no. 686

Sidekick and Dashboard Do Windows 95

You can do a lot with $50: rent 16 movies, buy a stack of paperback novels, or purchase either of two new Windows 95 utilities by Starfish Software. The 32-bit versions of Sidekick, a basic personal information manager, and Dashboard, a desktop organizer and control panel, are inexpensive and worth considering.

Sidekick 95 requires only 4MB of hard drive space and takes a no-fuss approach to tracking your contact records, appointments, and tasks. The program retains its predecessor's day-planner interface but adds more flexibility. For example, you can customize contact files, or scan your daily appointments and to-do's with a new Reminder screen. Sidekick 95 also offers time-savers such as a basic word processor and an expense-report creator. An improved phone dialer updates the contact log after you place a call.

On the downside, Sidekick still doesn't let you link other documents to contact names, a limitation I find unacceptable in a PIM. (Higher-end programs, such as the $99 NetManage Ecco Professional, have document-linking capabilities.)

Dashboard 95 provides fans with a familiar face under Windows 95. This utility is a launch panel for organizing and accessing applications, documents, and system information. Dashboard 95 is highly customizable and sits along the top or side of your screen. You can group applications into tabbed folders (which form the border of the panel) or let Dashboard do the work, creating folders of related programs such as "publishing."

New gauges keep track of system resources. For convenience, "quick launch" toolbars snap off the main Dashboard panel. You can hide or resize most of Dashboard's panel elements to suit your tastes.

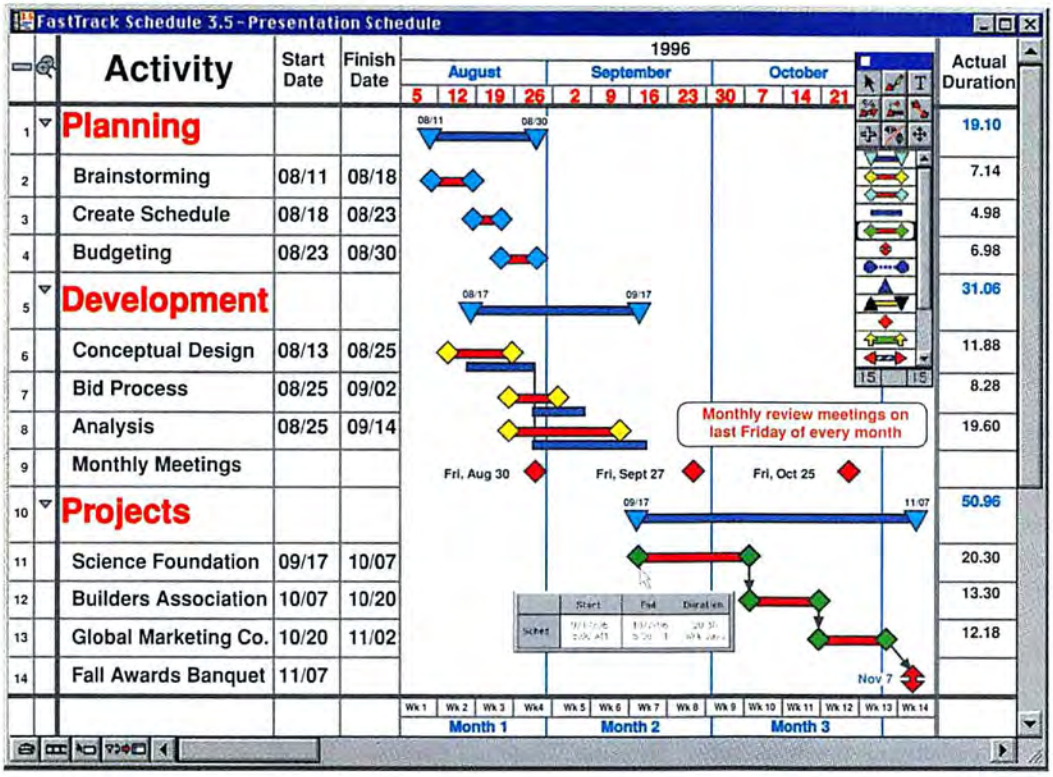
If you're happy with Windows 95's taskbar, you probably won't need Dashboard 95. But longtime Dashboard users will like having an old favorite in their corner.

—Laurianne McLaughlin

Sidekick 95 and Dashboard 95

Sidekick boasts greater flexibility; Dashboard offers a friendly control panel for Windows 95.
Starfish Software
800/765-7839
Street price: $49 each; upgrade $39
Reader service nos. 687, 688

Simple Scheduling. Impressive Power.



FastTrack Schedule™ for Windows95

No other scheduling tool is as easy-to-use or as powerful as FastTrack Schedule. There's no need for cumbersome project management packages, spreadsheets, or time-consuming drawing programs. Simply click and drag—or use your keyboard—to create presentation quality schedules in no time. And if you have questions, the extensive on-line help can assist, tutor, or remind you of every step.

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Start

WINDOWS MAGAZINE 1993 RECOMMENDED

"FastTrack Schedule... matches or exceeds the competing products in all aspects of project scheduling."

Windows Magazine

Zap-it Keeps Messages Flying

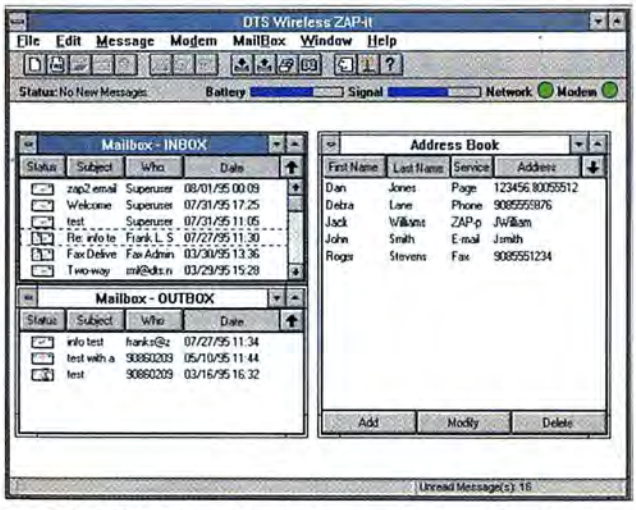
Mobile business people will appreciate the convenience and reasonable price of DTS Wireless's new Zap-it service, which provides wireless, two-way nationwide paging, e-mail, telephone messaging, and faxing over the RAM Mobile Data Network in 7700 U.S. cities.

For $9.95 per month plus message charges (which start at 39 cents for each e-mail), Zap-it works in conjunction with a notebook or Hewlett-Packard palmtop computer and any wireless modem that conforms to the Mobitex standard for data packet switching. DTS will lease you a Motorola InfoTAC wireless modem for $30 per month or sell it for $749; the InfoTAC is slightly larger and heavier than an HP palmtop.

Zap-it's software integrated easily with my HP 100LX, including the palmtop's address book. A single message can be sent to one or more people through multiple means. Using text-to-speech conversion, Zap-it can even deliver your messages via telephone. During setup, you can create personal voice greetings and fax cover sheets, as well as fax and e-mail attachments.

If you also need a telephone on the road, consider a cellular telephone–PDA combo such as the Simon from BellSouth (800/746-6672). Simon adds a telephone to the feature mix offered by the combination of an HP palmtop, the InfoTAC modem, and the RAM network—for half the initial price and less overall bulk. Still, the month-to-month expense of Zap-it should be much less. Which option will suit you better? It's your call.

–Joe Abernathy



THE ZAP-IT SERVICE provides wireless e-mail, voice mail, and faxing via the RAM Mobile Data Network over much of the United States.

Zap-it

Economical wireless messages from notebooks and palmtops.
DTS Wireless
800/967-0943, 908/602-1144
Pricing: $9.95 per month plus 39 cents for e-mail, 99 cents per voice message or faxed page; setup $34.95
Reader service no. 650

Easy File Transfers–No Cables Required

Adaptec's new line of low-cost infrared adapters—dubbed AIRport—make transferring and synchronizing files between notebook and desktop computers easier. Instead of fiddling with cables and connectors, you can create an instant wireless connection between your two PCs.

Many current notebooks have built-in infrared ports, but the IR link on your notebook is lonely without a partner. The AIRport 2000 cures that isolation. It's a 1½-inch-by-4-inch IR receiving unit that uses a 6-foot cable to hook up to your desktop PC's serial port.

But don't worry if your notebook doesn't have a built-in IR link—that's where the AIRport 1000 comes in. Considerably smaller than the 2000, it snaps onto the serial port of virtually any notebook PC, the vendor claims. (It was, however, a *very* tight fit in my Zenith Z-Star EX.) The AIRport 2500 kit contains both units.

All versions come with TranXit, a Windows 3.1 utility that transfers files in either direction and synchronizes the directories on both PCs; it works with Windows 95. TranXit doesn't have all the bells and whistles of Traveling Software's LapLink, but it does the job. It's finicky about serial ports and Windows serial drivers, though—it locked up the first time I tried to run it. The latest version of Serial.386 from Microsoft's area on CompuServe solved the problem.

With TranXit running on both PCs, you point the desktop's AIRport 2000 at the notebook's IR port or AIRport 1000, within three feet of each other, and they start communicating. The maximum transfer rate is 115,200 bps, but I had to bump down to 57,600 to get a reliable connection in an office with bright fluorescent lighting—the flickering light confused the AIRports.

AIRport is handy and not much more expensive than a cable-based software transfer utility such as LapLink. Its main drawback is size: too big to leave attached to your notebook, but small enough to misplace easily.

–Stan Miastkowski

AIRport

Transfer and synchronize notebook and desktop files.
Adaptec
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Reader service no. 651

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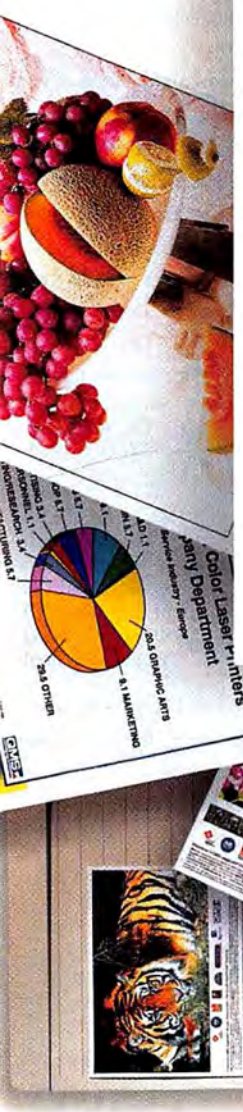

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Circle 181 on reader service card

New Back-UPS®: $119 blackouts, brownouts

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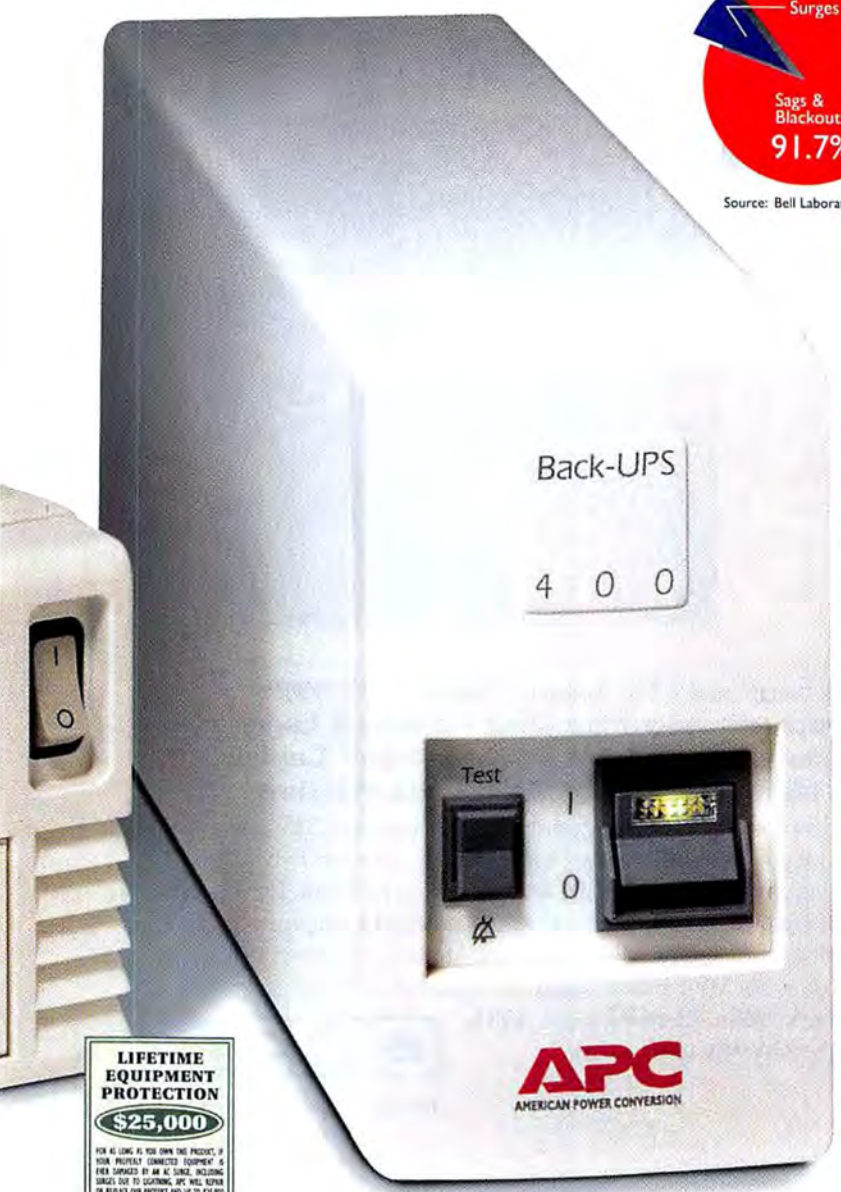
That's why we've just introduced new models in our award-winning Back-UPS line, now delivering reliable protection for just $119.

Source: Contingency Planning

Source: Bell Laboratories



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IN THE NEXT THREE MONTHS, MORE THAN 30,000,000 PCs WILL BE HIT BY POWER PROBLEMS...

Who needs power protection? If you use a computer, you do. A study in a recent *PCWeek* showed that the largest single cause of data loss is bad power, accounting for almost as much data loss as all other causes combined. Every PC plugged into an outlet is vulnerable. In fact, you have better odds of winning the lottery than of escaping the sting of power problems. One study found a typical PC is hit over 100 times a month, causing keyboard lockups, hard drive damage, and worse.

Simply put, if power problems are the least of your troubles, you've got one chance to keep it that way. You insure your car and home with the best policy you can afford. It just doesn't make sense to leave your PC (which is at far greater statistical risk) vulnerable to loss or damage.

WHY A $119 APC UPS COSTS LESS THAN A $9.99 "SURGE PROTECTOR"...

Contrary to most people's belief, a PC alone already has more protection built into it than a low-end "surge suppressor," which is usually nothing more than a well-packaged extension cord. In other words, going without any protection is just as good as underspending on one of the most important PC decisions you'll make.

For extended brownout protection for advanced PC workstations call about APC's New Back-UPS Pro!

And since sags and blackouts represent more than 90% of power problems likely to hit your computer, even quality, high-performance surge suppressors are literally powerless to protect you from data loss.

That's why you need instantaneous battery backup power from an APC Uninterruptible Power Supply to prevent

PC World Top 20 Upgrade *"Don't take chances. Get the ultimate protection... from APC."* --PCWorld

"★★★★ Back-UPS should be standard on every desktop... effective, affordable, designed to last..." --PC Computing

"A UPS can pay for itself the first time it saves your data." --MacUser

PC MAGAZINE UK EDITORS' CHOICE *"The clear winner in price performance... it's unbeatable..."* --PC Magazine UK

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protection against and other trials by fire

More than 3,000,000 satisfied customers count on APC reliability that goes above and beyond the call of duty

After a raging fire which took 18 trucks to subdue, Michael Benolkin, director of the Systems Division at Correa Enterprises, Inc. didn't expect much. "While rummaging through the ashes, we heard something beeping. Our four APC units were still in action, while two UPSes from another brand were history. We're still using these same APC units at our new office location - they still work like a charm! We're impressed with the ruggedness, reliability, and product support offered by APC."

Trial by Fire

Brian Krause, Network Manager for Goodyear Airship Operations, knows how critical APC protection can be." The night of the All-star game a tornado came through our blimp hanger and took out our roof. Our airships demand absolute communication so I protect our local and remote servers with the most reliable protection I can find: APC. APC's PowerChute software shut our server down in an orderly way... closed out all files nice and neatly. When we reconnected, everything came back up perfectly, without a hitch."

Trial by Air

Doug Welch learns his reliability lessons well: "While still a Computer Science student, I was at home preparing a large spreadsheet for a final project when Anchorage experienced an all too common 5+ Richter earthquake. If not for my Back-UPS 400 it would have been back to square one! I'm now the Network Systems Manager at Charter College, in charge of three networks. I learned my UPS lesson well back in my student days. I've never been disappointed with APC and the product has had quite a work out."

Trial by Earth

Faced with a water main break, Mark Conley, Regional Manager of Novell's remote sales office in Detroit was amazed at APC's reliability. "The APC unit was sitting in an inch and a half of water, working just fine, as though nothing was unusual and we lost no data to this disaster. We've used APC here now for at least four years - more than a dozen units are all around the office, and we're well satisfied, so we were even more impressed to learn that the units are amphibious!"

Trial by Water

Back-UPS Award Winning FEATURES

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- $25,000 lifetime Equipment Protection
- 10 minute runtime with specified applications. For longer runtimes choose next largest unit.

Model	Application	Sugg.List
200 **NEW**	"Green" PCs	$119
280 **NEW**	LAN Nodes	$139
400	Desktop 486/386 systems	$199
450	Tower 486/386 systems	$254
600	CAD/CAM workstations	$359
900	Longer runtime	$529
1250	Multiple systems	$689

keyboard lockups, data loss, and crashes. With an APC UPS, you get six times the protection of a high-end surge protector for little more than twice the price. And $119 is much less expensive than false peace of mind. APC UPSs carry up to a $25,000 lifetime guarantee against surge damage to your properly connected equipment, and are available to suit any application, from network servers and PCs, to fax and satellite systems.

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It's been said that there are two types of computer users: those who have lost data, and those who are about to. Prevent the single largest cause of computer problems and join a fast-growing third category: those who protect their PC's with the most reliable protection they can buy: APC UPSes. So ask for APC at your favorite reseller. At just $119 an APC UPS is serious protection no serious computer user should be without.

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APC has won more awards for reliability than all other UPS vendors combined...

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Create and Manage a Web Site

If you want to save money and have maximum control over your World Wide Web site, you'll want to set up your own server instead of paying an Internet service provider to do it for you. But setting up a server requires an understanding of the Unix operating system and plenty of cash. That's about to change. WebSite from O'Reilly and Associates is a full-featured Web server that runs under Windows 95 or Windows NT for a street price of $325, a fraction of what other packages cost. The product is extremely easy to use and ideal for anyone who wants to create a simple Web site.

Creating a site typically takes an entire morning, but with WebSite I got one running under Windows 95 in less than an hour. WebSite's wizards walk you through the creation of a simple Home page and help you link that page to the other documents and resources you want to publish on your site; however, there's no HTML editor for creating complicated documents with graphics and lots of formatting.

WebSite includes WebView, which helps check hypertext links. It also includes WebIndex, which lets users search for keywords in your documents, and an image map editor so you can make links from specific parts of an image. WebSite requires Windows 95 or NT and an Internet link (dial-up or dedicated).

Server administration tools include password restrictions to discourage hackers, and logs to track server use. Unlike more expensive products, WebSite won't encrypt data, which matters only if you need secure transactions to sell products from your site.

–Peter Loshin

WebSite 1.0

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More Online Research for Businesses

If in-depth business research is your game and low cost is your aim, you'll want to consider Knight-Ridder Information's KR BusinessBase and DataTimes' EyeQ. Like Profound (see *Top of the News*, September), these new services are less expensive and easier to use than other online options such as Lexis/Nexis.

KR BusinessBase provides access to a subset of Dialog news and business databases including 50 domestic and foreign newspapers and news wires, and reports from some 25 research organizations, including Standard & Poor's and TRW. Searching is easy: You type in the ticker symbol or the name of a company and click the Find button. KR BusinessBase limits you to searches by company name; you're out of luck if you want general industry information. KR BusinessBase costs $10 to $35 per user each month, with additional charges for viewing documents.

If you spend time fishing for general business information, consider DataTimes' new EyeQ service. EyeQ lets you search for keywords in a database composed of more than 5200 sources including domestic and foreign print and broadcast news, as well as financial and stock market information. DataTimes simplifies searching with what it calls a *natural language interface*, which lets you enter simple terms such as 'what' or 'who', and EyeQ helps you narrow your search if the number of items found proves too high. An alternative Command Mode search allows users to create more efficient Boolean searches. EyeQ costs $39 per month, plus charges to view documents.

–Jiri Weiss

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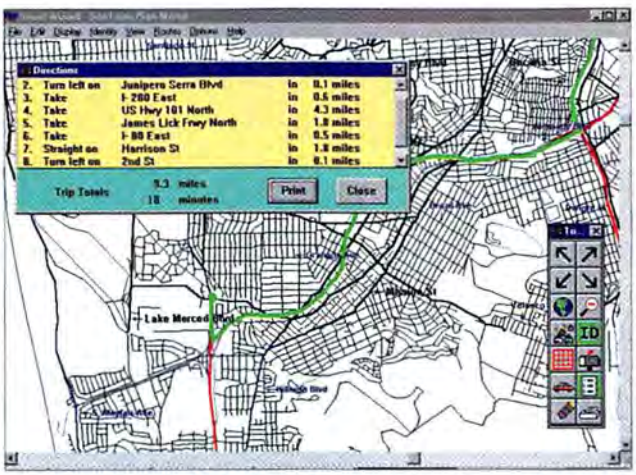
Street Wizard Mapping Software for Windows

This handy mapping program takes some of the guesswork out of traveling. Packed with maps for the 150 largest U.S. cities and their suburbs, the Street Wizard CD-ROM can help when you're planning a trip or when you're in need of quick directions. Additional maps are available at $29 per county. (As a bonus, the disc includes county maps for all of California.) Street Wizard maps out routes between points you specify, then it translates the mapped route into a set of directions. You can print out the map and directions, or save the map of an entire city to a floppy disk and take it with you on the road. Street Wizard's maps are sometimes a little confusing, but three customizable toolbars help you adjust the view, or add text to the map. Street Wizard for Windows has a street price of $49. It runs under Windows 3.1 and Windows 95. Adept Computer Solutions, 800/578-6277, 619/597-1776.

Reader service no. 668



DRIVING IS NO SWEAT if you use Street Wizard's maps and instant directions. This CD-ROM covers 150 U.S. metropolitan areas.

PaperPort Vx

Clear off your desk and organize your work with the new version of Visioneer's PaperPort, a cleverly designed personal scanner and convenience copier. This 12-inch-long device fits easily between your monitor and keyboard, plugging into any serial or parallel port on your computer. The PaperPort Vx requires you to feed one sheet of paper at a time, but it works quickly, scanning a letter in about 6 seconds. You can then convert the document into a text file with the included OCR software (OmniPage Lite); make copies; or, if you have a fax-modem, fax a copy. Visioneer also includes Corex CardScan BCR software, which helps manage scanned business cards. The original PaperPort's 1-bit grayscale quality has been upgraded to 8-bit, and its new SharpPage technology converts color documents to readable black-and-white images for printing, faxing, and filing. Street price for the PaperPort Vx is $369. Visioneer, 800/787-7007.

Reader service no. 669

OfficeBlox

If you're fed up with bloated Windows 95 applications that munch up your hard drive space, you'll like OfficeBlox. This package is a compact group of five 32-bit, OLE 2.0–enabled applets. Each one works on its own or in conjunction with existing OLE-enabled applications. NoteBlox, an electronic "sticky pad," lets you attach notes or comments to your business documents. CalcBlox offers basic spreadsheet functionality without the feature glut, allowing you to create and save a number of calculations and perform business analysis using its built-in templates. ListBlox lets you manage all types of lists, including to-do items, and contact names and addresses. Dashboard fans will like ToolBlox, a customizable toolbar that provides easy access to any of the OfficeBlox programs or to any of your 16- or 32-bit applications and documents. Finally, WorkBlox, a visual desktop organizer, lets you organize multiple files by project. OfficeBlox, which lists for $99, requires Windows 95. AlphaBlox USA, Inc., 617/229-2924.

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FastStart Office Packs

Village Software's templates for Excel 95 can help you tackle common business problems. The $29 FastStart Office Pack —11 templates for managing routine office tasks—includes logs for shipping and receiving, accounts payable and receivable, scheduling employee vacations, and more. The $29 FastStart Analysis Pack has 11 templates that cover financial and strategy issues, such as planning insurance, forecasting sales, and determining breakeven profit points. The company's series of FastAnswer products, which sell for $59 to $99, tackle thornier problems: Individual programs include FastCast for Ventures, a financial forecast generator; Money Controller, a personal financial manager; and Stock Investor Plus, a portfolio management system. Village Software also offers 16-bit versions of all its products for Excel versions 4.0 and 5.0 for Windows, 1-2-3 releases 4.0 and 5.0 for Windows, and Quattro Pro versions 5.0 and 6.0 for Windows. Village Software, 800/724-9332.

Reader service no. 671

CAD/Draw 4 Level 1

TommySoftware has introduced a 32-bit CAD program that's affordable, simple to learn, and easy to use. In this $79 application, you'll find an uncomplicated interface and a helpful online guide. CAD/Draw 4 Level 1 lets you tackle sketching and drafting projects such as floor plans, landscapes, and technical illustrations. It also reads AutoCAD drawings. The program's Smart Libraries store up to a million symbols, such as objects in your sketches. If you change an object, CAD/Draw saves you time by automatically updating all the drawings (located anywhere on your hard disk) that use that symbol. Shipped on CD-ROM, CAD/Draw includes a text editor, TrueType and PostScript font support, and an online tutorial. Although you currently can work only in 2-D, an

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upcoming add-on module will provide 3-D capability. CAD/Draw is compatible with both Windows 95 and Windows NT 3.51. TommySoftware, 800/275-9406.

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Keep adding new applications to your PC, and you'll soon feel as if you're watching a B movie called *Invasion of the Fonts*. Added fonts from new applications can quickly eat up hard drive space and Windows resources. To fix this situation, consider Ares FontMinder 3.0, a 32-bit program for Windows 95 and Windows 3.1 that automatically detects new fonts and finds duplicates, letting you easily delete unwanted fonts. The program has a new tabbed interface and extensive drag-and-drop capabilities. You can also organize fonts into groups according to work projects, for example. FontMinder lists for $79.95; upgrade price is $24.95. Ares Software, 800/783-2737.

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Viewer95

Mastersoft's Viewer95 lets you view and print files done in more than 250 formats, without needing the original application. When you install Viewer95, it integrates with Windows 95's Explorer and with popular e-mail and word processing applications, so you can view and manage files right from those apps. Other Viewer95 features include the abilities to search text, compare documents, and launch applications. The Save As feature allows you to save a file in WordPerfect, Ami Pro, Microsoft Word, HTML, ASCII, and RTF file formats, without the respective applications. Street price for Viewer95 is $79, or $219 for five users and $319 for ten users. Mastersoft, 800/624-6107, 602/948-4888.

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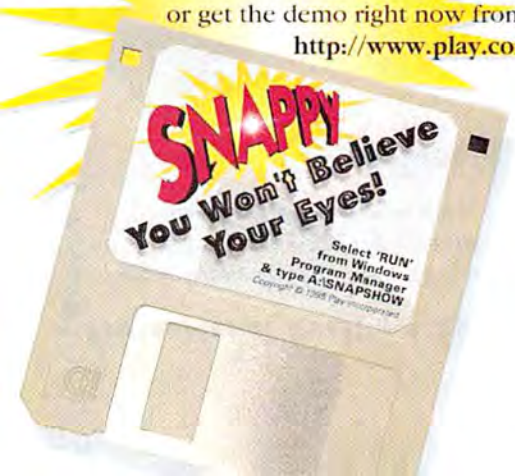

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Internet Publisher

Novell has shipped a new version of its Internet Publisher add-on for WordPerfect 6.1 for Windows, which lets you use WordPerfect to create pages for the World Wide Web. Internet Publisher supports some new HTML tags, including tables, and it offers a fully licensed copy of Netscape's Navigator 1.1 Web browser. Unfortunately, Internet Publisher is clumsy to use. To create a new HTML file, for example, you save it in WordPerfect format, then use an export tool. Converting existing files to HTML is even tougher: You need to copy the text from the original file and paste it into a new HTML document—and you lose all formatting, including graphics. (A table-conversion tool is included.) Internet Publisher is free for download from http://wp.novell.com/elecpub/inttoc.htm. Novell, 800/451-5151.

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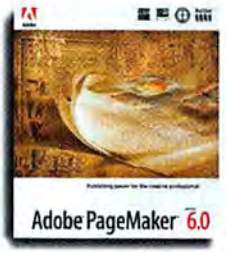

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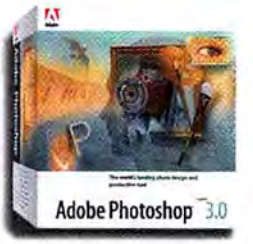

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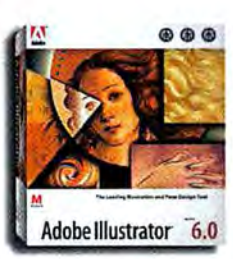

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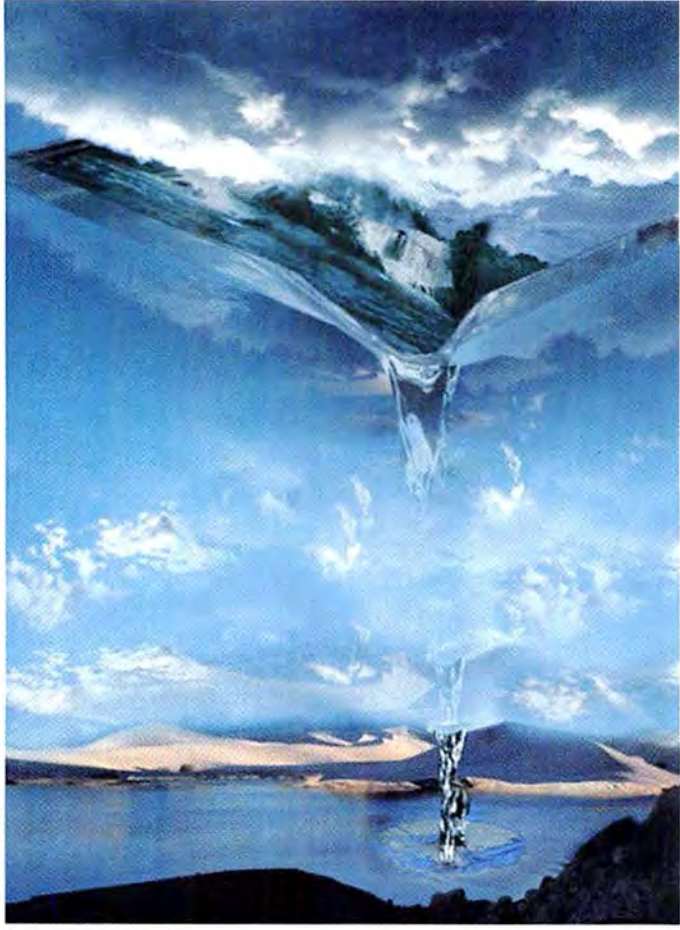

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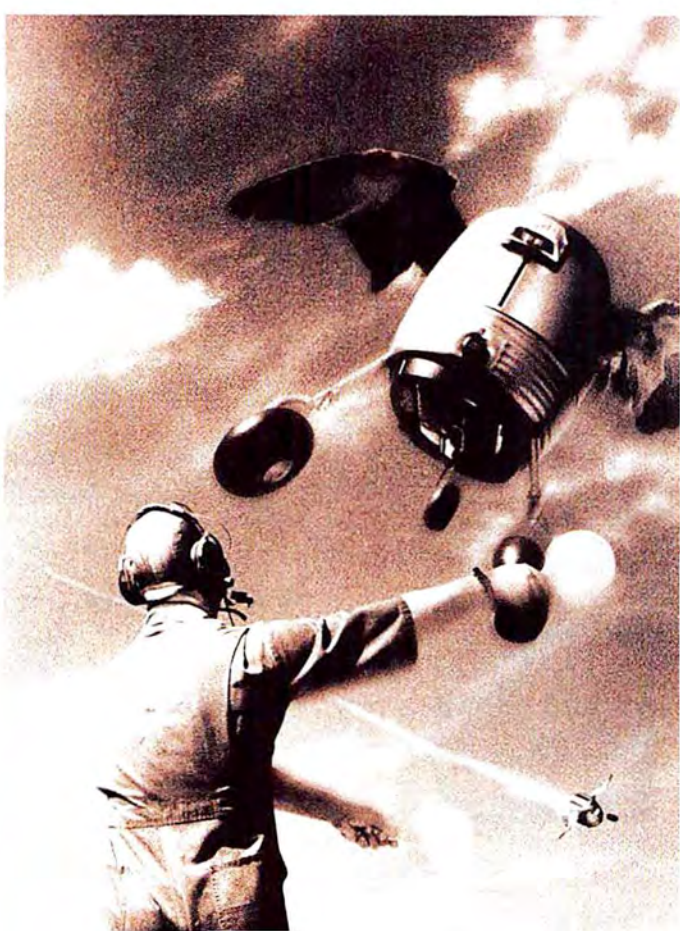

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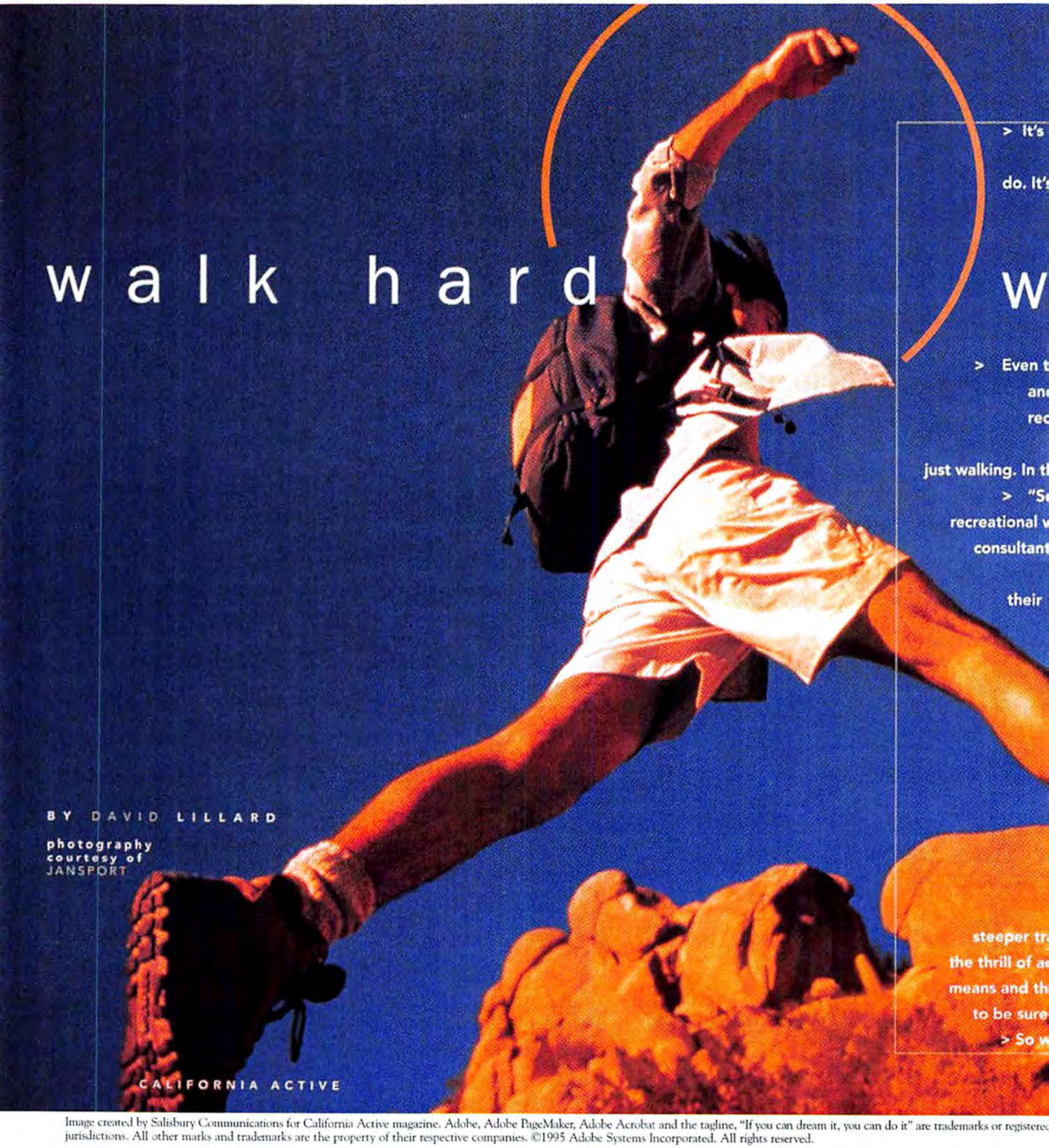
Circle 32 on reader service card

MIKE SALISBURY



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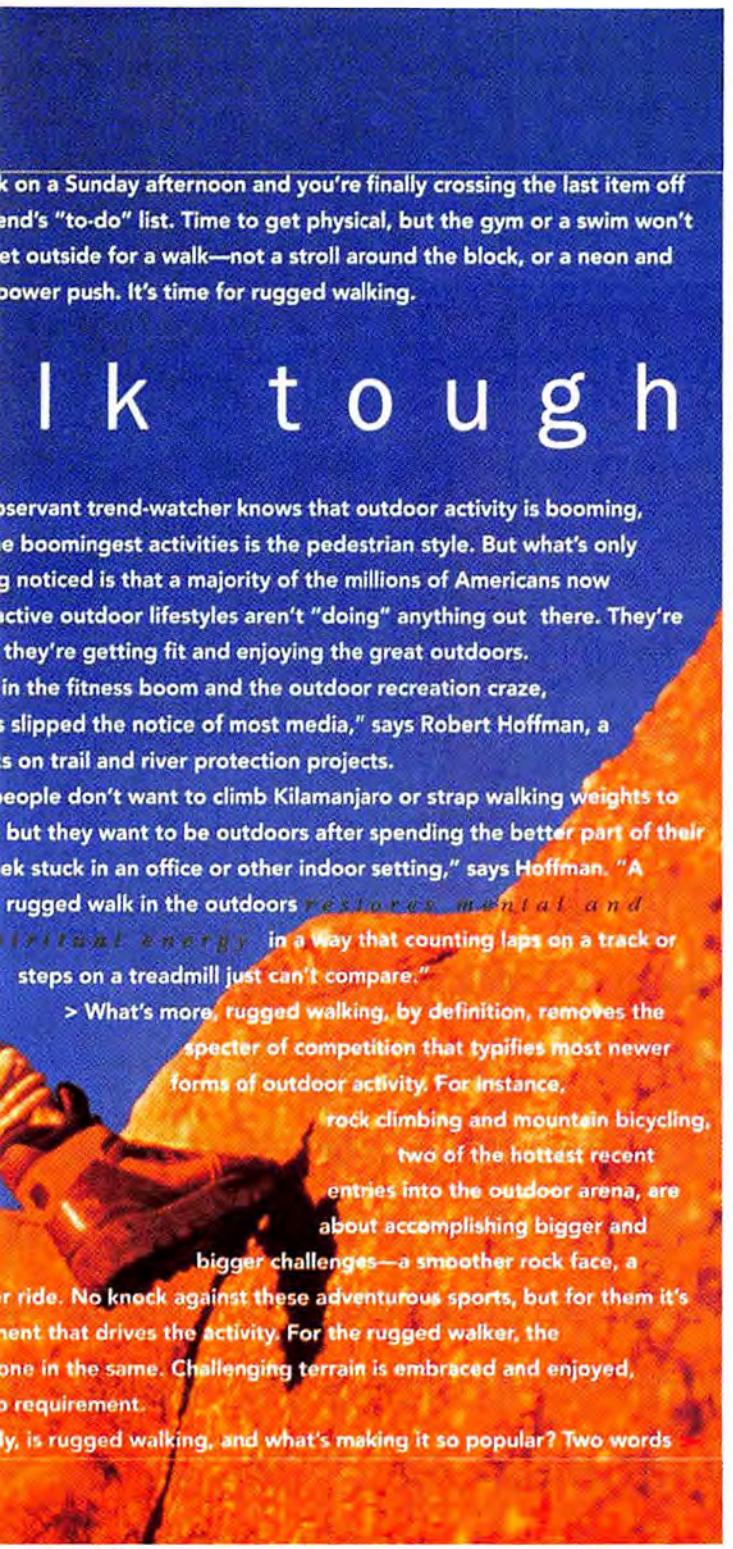
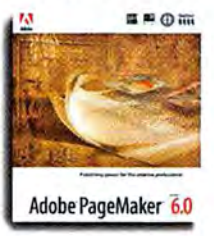
on PageMaker 6.0.



Mike Salisbury uses Adobe™ PageMaker™ to create designs so powerful they've become part of our collective consciousness. Layouts for Rolling Stone magazine, posters for Jurassic Park and Aliens, and Michael Jackson album covers bear his imprint. Now there's a radically new Adobe PageMaker 6.0 upgrade. "The interface is so natural, it never interferes with my ideas", says Salisbury, "and this new version is really over the top. I'm getting dead-on color from start to finish because it's locked into Kodak's Precision Color Management System." Hot new features include multiple master pages to streamline the creation of different page designs in a single publication; grouping and ungrouping to combine elements into a single movable, editable unit; integrated automatic trapping for color publications; and full compatibility with Adobe Acrobat™ and HTML so any document can be sent anywhere electronically. Adobe PageMaker 6.0 is here, so even if you're not creating professional design, this is the tool to give you professional looking results. Call 1-800-521-1976, Ext. L1672 for more information or visit our web site at http://www.adobe.com/.



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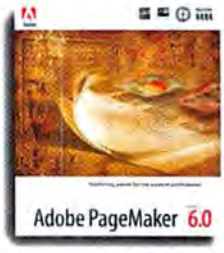

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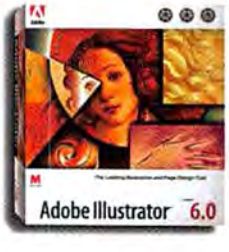

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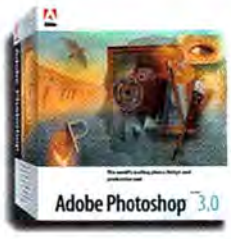

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EDITORS' CHOICE

75 BEST CDs

PC World editors and contributors audition literally hundreds of CD-ROM packages throughout the year, but only a handful make it to these pages. Here are the select silver platters that we think are worthy of your consideration as holiday gifts. We have arranged our buyer's guide by the popular categories: games, movie guides, art and culture, reference and how-to, kids, science and history, and travel. CD-ROMs that offer the Windows 95 autoplay feature are noted with a *W95* in the buying information. The RSN is the product's reader service number.

EDITED BY MICHAEL S. LASKY

Let the Games Begin

BY GREGG KEIZER

Windows 95 has been hogging my machine's disk space for months, so I jumped at **Fury3** *(Microsoft, W95, $44.95, 800/426-9400, RSN 695)*, a sci-fi shoot-em-up that runs under the new operating system. As long as you have a solid joystick, you'll love battling across eight planets and blowing up stuff in the air and on the ground against a sharply rendered backdrop of a Star Wars–style future. And let the squirts in the family have their Nintendo: You've got the wildly enhanced Windows 95 version of **Pitfall: The Mayan Adventure** *(Activision, W95, $50, 800/477-3650, RSN 696)* in the drive. It may have begun as a basic Atari 2600 run-jump-leap-climb video game, but the way Pitfall's Harry now hangs on ropes, boings on bungee vines, and whips back those gators, this superbly souped-up version should put a grin on any 40-year-old's face. Just as entertaining is **Virtual Pool** *(Interplay, $40 street, 800/468-3775, RSN 697)*. This 3-D simulation is the best substitute for a real pool hall—you can give the ball English, walk around the table, even move the stick for trick shots. Helpful videos of pool pros show exactly how to score at trick and normal shots, and the gliding 3-D views are almost better than the real thing. You can also play against others over a modem or on a network, but this one's fun all on its own.

Strap yourself inside a big, bad robot looking for trouble in **MechWarrior 2** *(Activision, $60, 800/477-3650, RSN 698)*, a first-person–perspective, one-on-one combat game with cool 3-D graphics. Lumbering along in one of the 15 available 'mechs—which you can customize, as if it's the 21st-century version of a 1950s hot rod—you can blast away at the other guy and climb up the career ladder when you waste him. Eat your heart out, Mad Max.

Long, plot-driven games are about as welcome around here as an incontinent pooch on the good carpet, but **Phantasmagoria** *(Sierra, W95, $70, 800/757-7707, RSN 699)* is worth a scream or two. You know there's video in this thing—it comes on *seven* CDs, for cryin' out loud—and while the evil mansion motif is beginning to wear thin in gaming these days, the mystery here should be enough to keep you going—despite the awful acting. Just when you're ready to pack it in, the game throws out another unexpected twist to keep you searching. But remember: Don't go in the cellar!

You can't go any farther in the opposite direction from the blood and ghosts of Phantasmagoria than **Qwirks** *(Spectrum HoloByte, $29 street, 800/695-4263, RSN 700)*, a new arcade-style game reminiscent of Tetris. Qwirks are M&M–like button pairs linked like Siamese twins. As the Quirks drop relentlessly from the sky, you've got to position them in sets of two or more to get rid of them because once they fill up your screen, you lose. Just when I thought there could be no more rational variations of Tetris, along comes this dangerously addictive winner with a host of different play modes, including a puzzle challenge that gives the term *brain twister* a new meaning.

The Win 95 version of Pitfall really whips the old Atari 2600 standby.

The Dig *(LucasArts Entertainment, $49 street, 800/985-8227, RSN 701)* and **Star Trek: The Next Generation "A Final Unity"** *(Spectrum HoloByte, $55 street, 800/695-4263, RSN 702)* are two character- and plot-driven deep-space adventure games with a click-and-hunt approach that turns players into keyboard detectives rather than space explorers. A Final Unity is enhanced by the voices of actors from the TV series, along with enough of the expected Trekkie accoutrements to make us think we're actually working alongside the story's characters. The Dig is a Steven Spielberg–inspired adventure that's souped up with smashing special effects, great graphics, and a movie-style sound track. The Dig's characters and dialogue get us quickly involved in the threat of an errant asteroid that's rapidly approaching Earth. The mystery unravels as we explore deep within the asteroid.

Cool 3-D graphics and throbbing sound blast you into the 21st century with MechWarrior 2.

Movie Guides

Finding the Best Show in Town

BY LINCOLN SPECTOR

VideoHound finds all the movies—even the dogs.

The **All-Movie Guide** *(Corel Corp., W95, $24.95, 800/772-6735, RSN 703)* is a great resource if you're simply looking for something to rent. If you know the category of the movie you want to see, AMG will give you a breakdown of what's out there—be it, say, a patriotic flag waver, a black comedy, a film with a hospital setting, or a Canadian supernatural thriller made between 1967 and 1988. But strangely enough, it won't let you add actors, directors, or other people to your search criteria—there's no way to get a list of John Ford Westerns starring John Wayne, for example. What a strange, unfortunate limitation. If idiosyncratic movie categories are your thing, load **VideoHound Multimedia** *(Visible Ink Interactive, $39.95, 800/776-6265, RSN 704)* and click the *Category* button. You'll get a megalist of more than 900 categories—just about every way you can think of to classify a movie. Checking just the beginning of the M's, I found Macho Men, Mad Scientists, Magic, Magic Carpet Rides, Management, Marriage, Martial Arts, Martin & Lewis, Martyred Pop Icons, and the Marx Brothers. VideoHound also wins the cute interface award with its silly canine cartoons. Films are rated by bones—the more awarded, the better the videohound liked it. So movies that are "dogs" don't get any. It's short on encyclopedia-type information, but it's fun and the price is right.

The Cinemania titles have always been rich in features and content. The Windows 95–only version, **Microsoft Cinemania 96** *(Microsoft, W95, $59, 800-426-9400, RSN 705)* includes reviews from three popular movie critics—Pauline Kael, Leonard Maltin, and Roger Ebert—plus plenty of biographies, articles on assorted topics, and definitions of film terms, all held together with an easy-to-navigate hypertext design that makes cross-referencing a snap. If you're looking for a particular kind of flick, Cinemania won't give you as many ways to find it as All-Movie. But once you've found it, you're likely to spend the next couple of hours jumping from one hypertext link to another, most of which include movie scenes, pictures of the stars, and video and sound bites.

As the price will tell you, **The Motion Picture Guide** *(CineBooks, $199.50 direct, $99 for annual updates, 800/246-3776, RSN 706)* is intended for serious students of the cinema. No cute interface, no jerky film clips, no sound bites—just plain old information with a text counterpart that comes in 20 volumes. The search tool is decent and will look for a name across all kinds of credits, so you can find, for example, movies that Robert Redford starred in or directed. When you find a film, you get basic information: a full cast list, a synopsis, and full credits. Unfortunately, it all but ignores the silent era.

Art and Culture

Desktop Museums

BY MICHAEL S. LASKY

The most successful art titles of this season are **Monet, Verlaine, Debussy: The Impressionist Revolution** and **Matisse, Aragon, Prokofiev: An Interactive Adventure in Art** *(New Line New Media, $49.98 each, 800/421-1877, RSN 707)*. The first offerings in the ambitious Great Artists Collection show how the influence of these two groupings of painters, poets, and composers became woven into Western culture. To achieve this, the discs assemble hundreds of paintings, readings of more than 60 poems, and some 75 minutes of music. You can stroll, er, click, through a gallery of Impressionist masterpieces while listening to Debussy or hear a poetry reading while viewing a work by Matisse. You can view an artist's oeuvre or browse individual pieces that reflect the common themes pervading each artist's works. Best of all, you can play the discs directly from your CD-ROM without having to install any files on your system.

For kids of all ages, **With Open Eyes** *(Voyager, $39.95, 800/446-2001, RSN 708)* is a grand art appreciation package that immediately engages the viewer with well-realized, full-screen shots of more than 200 pictures from the Chicago Institute of Art. While it relies on games (find the object in the painting) and a hyper-visual and audio-revved

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interface to pull in youngsters, I dare any adult not to be captivated as well.

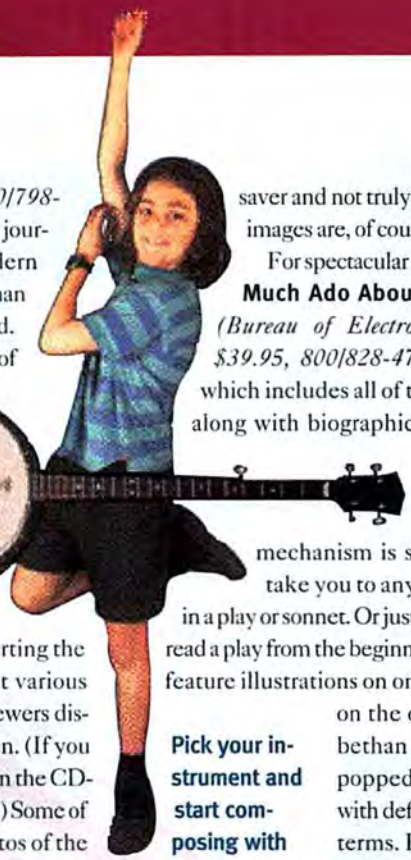
One of the best reasons not to go to Paris is that you can now visit **Le Louvre—The Palace & Its Paintings** *(BMG Interactive Entertainment, $49.95, 212/930-4403, RSN 709)* anytime from your desktop. This beautifully conceived virtual tour of every gallery and piece of art in the grand French museum is almost better than being there. This CD supplements high-resolution images of paintings and sculptures with informative narration or text, evocative music, and a meticulous interface that lets you explore the museum's art collections as well as its architecture and history. Various perspectives give you detailed ceiling-to-floor views of the galleries, and a magnifying lens lets you examine close-up sections of the paintings. *Magnifique!*

If the Louvre sounds too high-falutin' for you, flip to the present and take a visit to the absolutely hilarious (and quite real) **Museum of Bad Art** *(Backyard Computing, $19.95 street, 617/444-6757, RSN 710)*. The Boston-based collection of art—so dreadful that only the artists' mothers could love it—is packaged as a virtual gallery tour, complete with other patrons. As you mouse-click through the museum, you not only see the picture but hear visitors' comments. ("Every once in a while, someone tries to lick the paintings. We discourage that," notes a security guard.) It's all tongue-in-cheek, eye-winking, kitschy fun. If this hall of black humor is not to your taste, head to the Great White Way for **Hirschfeld Great Entertainers** *(Jasmine Multimedia, $49.95 street, 800/798-7535, RSN 711)*, an interactive journey through a history of modern show business as seen in more than 400 caricatures by Al Hirschfeld. This comprehensive collection of the master's pen-and-ink work of 70 years is designed to allow browsing by subject, celebrity name, or via a time line. One of Hirschfeld's trademarks is inserting the name of his daughter, Nina, at various points in his pictures, letting viewers discover where her name is hidden. (If you need assistance, a Nina Finder on the CD-ROM shows you where they are.) Some of the drawings are linked to photos of the stars; click the caricature and watch it morph to the actual image.

Take a desktop tour of one of the world's great art museums in Le Louvre—The Palace and Its Paintings.

Photography is also well served in new CDs. **Robert Mapplethorpe: An Overview** *(Digital Collections, $79.95, 800/449-6220, RSN 712)* is the first in a series of titles that will collect all of the controversial photographer's work. This disc focuses on the breadth of his images—from portraits and male figures to flowers, landscapes, and mixed media—omitting any of the artist's overtly sexual material (that material will come on another disc). Audio and video interviews with the artist and his contemporaries round out the well-presented and easy-to-navigate gallery.

Landscape genius Ansel Adams is represented by the **Ansel Adams Screensaver** *(Time Warner Electronic Publishing, $29.95 street, 800/759-0190, RSN 713)*, which includes 25 select photographs and quotations from his writings. Alas, this is just a screen saver and not truly a gallery, but the images are, of course, spectacular.



Pick your instrument and start composing with the Making Music disc.

For spectacular wordplay, there's **Much Ado About Shakespeare** *(Bureau of Electronic Publishing, $39.95, 800/828-4766, RSN 714)*, which includes all of the Bard's works along with biographical material and some period illustrations. The text-searching mechanism is speedy and will take you to any word or phrase in a play or sonnet. Or just select a title and read a play from the beginning. The screens feature illustrations on one side with text on the other. An Elizabethan glossary can be popped up on the fly with definitions of arcane terms. For words closer to our day, check out **American Poetry: The Nineteenth Century** *(Voyager, $39.95, 800/426-2001, RSN 715)*. It has more than 1000 poems presented chronologically and by poet. The text can be searched by author, title, word, and first line. Some six hours worth of readings performed by Garrison Keillor, Calvin Trillin, and others add to the written word, as do biographical notes, photos, and extensive annotations.

Modern (some would say far-out) composer Morton Subotnick's **Making Music** *(Voyager, $39.95, 800/446-2001, RSN 716)* is ostensibly for kids—intended to let them experience what composing music is like before getting a formal music education. But Subotnick's finger-painting approach provides a completely addictive creative freedom that will probably hook adults. You select an instrument and then use your mouse to literally paint the screen with that sound. Add another instrument and do it all over again. Play it back. This free-for-all sounds pretty wild, but the CD's primers on rhythm and melody, scales, and instrumentation supply a structured—but no less fun—music education.

A Mapplethorpe flower: No controversy here.

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Thanks to Disney's new interactive CD-ROM, "The Lion King Activity Center", your kids can play for hours on end with Simba and his friends. There are nine exciting and challenging activities, which inspire children to learn and use their creativity. As they master each one, they can increase the difficulty so they'll never run out of fun things to do. It's bound to be the best workout your kids will ever have.

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Music games

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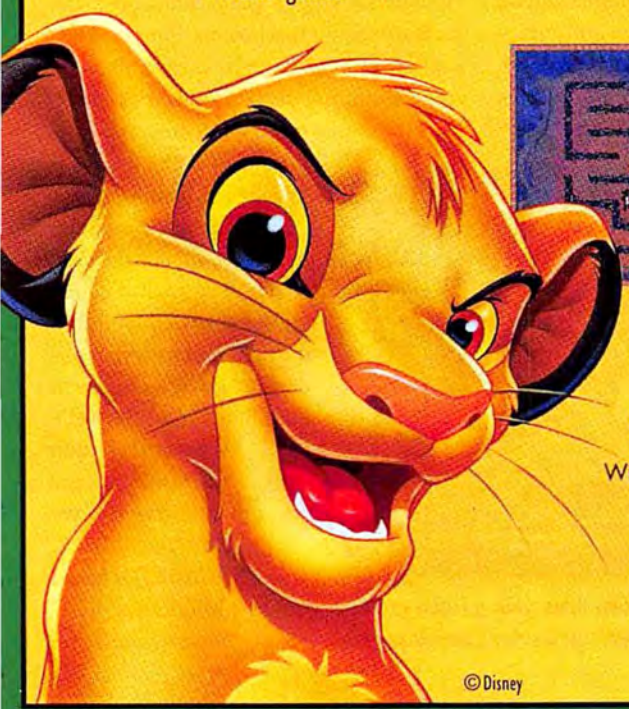

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Reference and How-To

Just Give Me the Facts!

BY MICHAEL S. LASKY

Encyclopedias like the **Britannica CD 2.0** *(Encyclopaedia Britannica, $695, 800/323-1229, RSN 717)* are the best arguments for CD-ROM power. Not only does this *single* disc include all 32 volumes of the print edition plus additional material, but searching for any topic takes just seconds. The Britannica cleverly employs the Netscape Navigator 1.1 browser as its search tool for the CD as well as its built-in Internet Web link, which has the latest updates on many topics. When you consider that the Tenth Edition of *Merriam-Webster's Collegiate Dictionary* is also included on this disc, Britannica CD, though not a multimedia product, seems like the ultimate CD-ROM reference tool.

Compton's Interactive Encyclopedia 1996 offers up its information as text, graphics, sound, or video.

You can't fly around the world using a two-dimensional printed atlas, but in **3D Atlas** *(Creative Wonders, $49.95 street, 800/245-4525, RSN 718)* you can take virtual globe-trotting flights, zooming in on an area such as San Francisco and getting close enough to see the Golden Gate Bridge. The disc features multiple 3-D spinning globes (physical, environmental, political) based on satellite images. Click on any part of one to zoom in with nine levels of detail. Interactive exhibits bring the natural environment and cultures of the world to life, and trivia quizzes add to the enjoyment of this beautifully designed disc. Not to be outdone, **Microsoft Encarta 96 World Atlas** *(Microsoft, W95, $49.95, 800/426-9400, RSN 719)* also supplies high-resolution satellite images—only more of them, plus a user-definable zoom control that closes in tight enough to show major roads and points of travel interest. The one catch: Encarta World Atlas 96 works only with Windows 95.

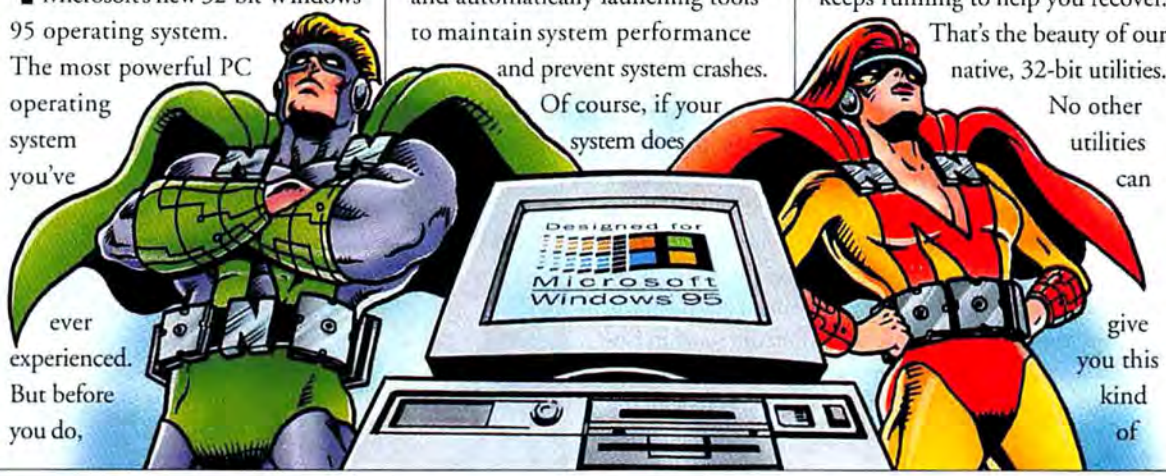
From big-city boulevards to isolated back roads, **Street Atlas USA 3.0** *(Delorme, $79 street, 800/452-5931 ext. 102, RSN 720)* can find and map exact locations. Sure, other mapping products can do this, but Street Atlas goes a few notches better with the addition of Delorme's three-disk **Phone Search USA** ($79 street; each product can be used on its own, and at present each is sold separately). Now you can find an address by zip code or phone number and see exactly where it is, right down to the location of a house on a block. Both the level of detail and the fast searching are welcome, as is a wealth of user-customizable functions that let you edit a map to get it to appear exactly the way you want. These features make this instant, personalized mapmaker, together with Phone Search, a must-buy package.

Other major multimedia encyclopedias vying for your bucks this year are **Microsoft Encarta 96** *(Microsoft, W95, $59, 800/426-9400, RSN 721)* and **Compton's Interactive Encyclopedia 1996** *(Compton's New Media, W95, $69.95 street, 800/261-6109, RSN 722)*. Both are worthy contenders, offering similar user-configurable search functions and feature-rich content. Compton's bundles its Windows (and Windows 95–ready) disc with Small Blue Planet's Real Picture World Atlas 2.0 and is pushing the encyclopedia's built-in link to its "live" updated encyclopedia forum on America Online (keyword **Comptons**). Encarta 96 for Windows 95 also has an update service via its fee-based Microsoft Network and its free Web site. Compton's, geared primarily to elementary and high-schoolers, is more show-and-tell oriented, letting users assemble and create a multimedia portfolio on a subject. Encarta seems more adult-tolerant. The interface in Compton's is initially a bit confusing.

How does your garden grow? Ask the Garden Encyclopedia.

Specialty niche encyclopedias also abound this year, among them a pair of garden guides that help you find the right plants for your garden and give you advice to help them grow. **Sunset's Western Garden CD-ROM** *(Sunset Publishing, $49.95, 800/829-0113, RSN 723)* is based on the authoritative, best-selling book of the same

You're ready to make the move to Microsoft's new 32-bit Windows 95 operating system. The most powerful PC operating system you've ever experienced. But before you do, background, monitoring your system and automatically launching tools to maintain system performance and prevent system crashes. Of course, if your system does crash or you accidentally erase a file, Norton Utilities for Windows 95 gives you the data recovery tools users have relied on from day one. Even if other applications crash, Norton Utilities for Windows 95 keeps running to help you recover. That's the beauty of our native, 32-bit utilities. No other utilities can give you this kind of continuous, real-time protection and data recovery in the brave new world of Windows 95.



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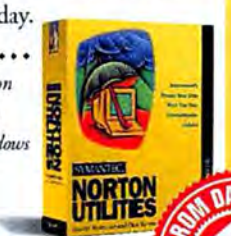

FROM DAY ONE NORTON FOR WINDOWS 95

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name. It's a no-frills, just-the-facts disc that features the text and illustrations of the book but adds a new leaf. Type in your zip code and the amount of sunlight and water available, along with the variety and color of plant you want, and it sprouts a custom list of recommendations and care details. The disc also includes an illustrated, straightforward A-to-Z encyclopedia listing of plants. **Garden Encyclopedia** *(Books That Work, $30 street, 800/242-4546, RSN 724)* tries too hard to go the multimedia route with its jerky how-to videos. So not surprisingly the most successful part of the disc is its customized plant finder, which is worth the disc's price. As with the Sunset disc, you list planting conditions, growing region, and preferences, and it gives you the dirt on which plants fit the bill.

For less down-to-earth diversions, there's **Star Trek Omnipedia** *(Simon & Schuster Interactive, $55, 800/910-0099, RSN 725)*, a trivia databank that plays as if it were beamed down directly from the starship Enterprise. Evoking the spirit and style of the original television show, its sequels, and the *Trek* movies, the Omnipedia's 6000 trivia entries, movie clips, animation, photos, and illustrations should delight all Trekkies. And the package can even respond—after a fashion—to a user's voice commands.

Kids' Corner

Big Fun for Little Tykes

BY ROBERTA FURGER

Children's books are coming to life this holiday season, as CD-ROM publishers rush to capture some of Living Books' young audience. Most of the titles combine a favorite story with activities from coloring books to games and puzzles. In Vroom Books' **The Escape of Marvin the Ape** *(T/Maker, $19.95, 800/986-2537, RSN 726)* kids help search for Marvin as he tours famous New York City sites. The story is narrated by Jonathan Winters and includes three games (even adults will get a giggle from the Musical Fruit Machine). Another storybook, **The Blue Tortoise** *(Corel Corp., $24.95, 800/772-6735, RSN 727)* features great graphics, and my kids loved being able to "color" the book themselves and print out the pages.

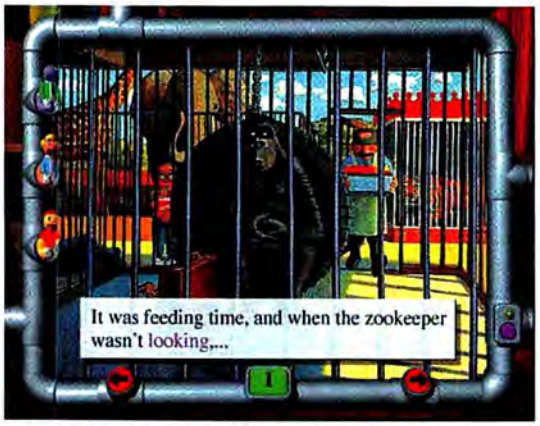
It's not a classic, but children aged 3 to 7 will be delighted with **Menlo the Frog, A Musical Fairy Tale** *(Windy Hill Productions, W95, $39.95, 800/354-6150, RSN 728)*. In this interactive cartoon story, kids join in the battle with the King of Later, who's stolen the key to music. The three activities teach children musical concepts such as rhythm and melody.

How Many Bugs in a Box *(Simon & Schuster Interactive, $49.95, 800/910-0099, RSN 729)* is supposed to be for preschoolers, but you'll get a chuckle or two from the goofy bugs that help kids learn their numbers. The songs are catchy, and the games (eight in all) are terrific. A sure hit.

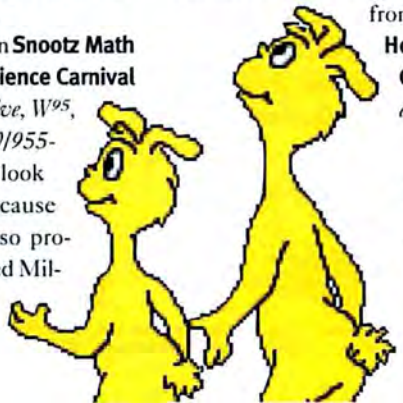
If the creatures in **Snootz Math Trek** or **Bumptz Science Carnival** *(Theatrix Interactive, W95, $34.95 each, 800/955-8749, RSN 730)* look familiar, it's because their developer also produced the acclaimed Millie's Math House and Bailey's Book House. Snootz and Bumptz encourage kids to think as they discover basic math and science concepts. The programs and their characters are original and engagingly fun.

Elroy Goes Bugzerk *(Headbone Interactive, $35 street, 800/267-4709, RSN 731)* is a wacky adventure that takes a little while to get into. But it soon becomes addictive as you assist Elroy in his quest for the Technoloptera and the grand prize in the Insectathon.

From Ethel the Elephant eating exploding eclairs to Little Lola Limbo-ing, the characters in **Dr. Seuss's ABC's** *(Living Books, $40 street, 800/397-4240, RSN 732)* are wacky and wonderful—just as you'd expect from a Theodor Geisel classic. There's even a visit from a Who or two. In **How the Leopard Got Its Spots** *(Microsoft, $34.95, 800/*



Comedian of a thousand voices Jonathan Winters tells the story of The Escape of Marvin the Ape.



Anyone hear a Who? A couple of zanies check out Dr. Seuss's ABCs.

Windows 95 is here. And it's really terrific.

Except for one thing: it doesn't include any anti-virus protection. And your old anti-virus software won't work in Windows 95 either. But thousands of old viruses will.

So that leaves you with a choice. Do nothing and hope you never come across an infected floppy or download an infected file. Or buy a new anti-virus software product that from the viruses everybody already knows about. But also from the new viruses created every day.

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can work in this new environment.

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Because Norton AntiVirus for Windows 95 scans files fast. Even compressed files.

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*Tests conducted by NCSA and Patricia M. Hoffman(VSUM), Aug. 1995. **Trade-up editions will run only where specified. Symantec, Central Point, McAfee or Dr. Solomon's products are already installed. Check with your software store for qualifying versions. Price does not include shipping & handling or any applicable sales tax. Symantec and Norton AntiVirus are registered trademarks of Symantec Corp. All other brand names or trademarks are the property of their respective owners. ©1995 Symantec Corp. All rights reserved. Visit us on the Internet at http://www.symantec.com. In Canada, call 1-800-365-8641. In Australia, call 2-879-6577. In Europe, call 31-71-353111.

It may not turn them into Alfred Hitchcocks, but Microsoft 3D Movie Maker will give your kids hours of creative fun.

426-9400, RSN 733), Rudyard Kipling's *Jungle Book* tale comes to life. The artwork is stunning, and Danny Glover's narration and Ladysmith Black Mombazo's music are first rate, but this CD is definitely for older children, since it doesn't have the lighthearted goofiness most preschoolers delight in.

Pint-size adventurers will be hooked on **Putt-Putt Saves the Zoo** *(Humongous Entertainment, $39.95 street, 800/499-8386, RSN 734)*. My daughter was glued to the computer until she was able to reunite all the baby animals with their parents. **Madeline and the Magnificent Puppet Show** *(Creative Wonders, W95, $39.95, 800/245-4525, RSN 736)* sends young players on a treasure hunt in search of a cape, invitations, balloons—everything needed to put on a puppet show. And they may even learn a few words of French while they're at it. Who says math can't be fun? It is in **James Discovers Math** *(Broderbund, $40, 800/521-6263, RSN 735)*. Ten different activities help preschool-aged children learn to tell time, to recognize shapes, patterns, and numbers, and to learn basic addition and subtraction—all in an enjoyable playtime setting.

The Adventures of Hyperman *(IBM Multimedia Studio, $42.95 street, 800/426-7235, RSN 737)* mixes animated cartoon characters with solid information about scientific principles. The educational stuff is tightly integrated into the adventure, so the focus is on the fun. **Zaark and the Night Team: The Quest for Patterns** *(Maxis, $34.95, 800/526-2947, RSN 738)* doesn't rely on humor but is a very original look at patterns as they exist in the environment, art, and music.

Yes, we have no oranges: James Discovers Math makes learning numbers easy.

In a series of missions, children begin to understand patterns and use that knowledge to set things right, from ridding suburbia of pollution to returning a Van Gogh painting to its original state.

For the under-10 crowd, **PerfectWorks for Kids** *(Novell, $34.95, W95, 800/451-5151, RSN 739)* brings together writing and creativity tools—there's a journal, a card and sign maker, and more—with a calendar and an address book. Most exciting, though, are its communications tools: access to America Online and (for Windows 95 users only) easy faxing and e-mail.

Creativity is also the key to the Windows 95–only **Microsoft 3D Movie Maker** *(Microsoft, W95, $49.95, 800/426-9400, RSN 740)*, recommended for those 10 and up. Budding Spike Lees and Penny Marshalls will spend hours playing with this sophisticated movie-creation program for kids. As director of a movie, they get to pick their sets, characters, plot, 3-D effects—you name it. After they've made their final cut, they can play the movie back or save it and send a copy to friends.

Be Your Own HOME PUBLISHER

Whether you want to create your own paper or multimedia invites, banners, or letterhead, you can do it all from your desktop with two easy-as-pie programs. The latest version of the decade-old publishing tool, Print Shop Deluxe Ensemble II (Broderbund Software, $79.95, 800/521-6263, RSN 741) is chock-full of ready-to-print designs, fonts, and graphics.

You can make your designs from the included templates or from your own artwork or Photo CD images, and with the built-in name-and-address list manager you can print those cards—or letters, invitations, and labels—and have them automatically customized and addressed.

Turn formerly static, two-dimensional designs into festive animated sight and sound shows with Studio M (Gold Disk, $49.95 street, 800/982-9888, RSN 742). It lets you easily create multimedia greetings or invitations and send them on floppy disks or by e-mail. Studio M is the Print Shop of the multimedia generation, and it can be learned just as quickly. You can include sound, animated graphics, and video in your "production," whether you design the elements from scratch or use one of the package's more than 50 customizable design templates. For instance, stick in a photo of yourself, use the handy cropping tool to shape it, then drag the image to replace an existing face in one of the straight-to-zany illustrations included in Studio M. —M.S.L.

THE TOP 10 REASONS WHY NORTON NAVIGATOR USERS WORK FASTER IN WINDOWS 95.

Congratulations! You're the proud owner of Microsoft's Windows 95 operating system. Working on a PC has never been easier.

Now try these ten easy exercises and see how you can work even better and faster in Windows 95 with the all-new Norton Navigator.™

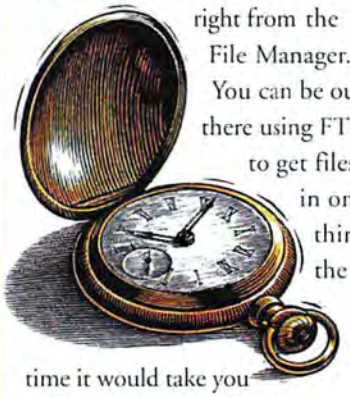
~~CLICK.~~
~~CLICK.~~
~~CLICK.~~
CLICK.

1. First, copy a file from one directory to another. Okay, now copy another file. On average, it takes about eleven steps per file. Now copy a file with Norton Navigator. Mission accomplished. One step.

2. Opening a folder in Windows 95 takes a full five clicks of your trusty mouse. But with Norton Navigator, you can open any folder with just one simple click.

3. Compress a file. Our built-in PK-Zip compatible compression saves you a minute every time.

4. Use Norton Navigator to plug into your Internet connection right from the File Manager. You can be out there using FTP to get files in one third the time it would take you with a separate application.



5. Try a word search for "profits" or any other text string within files. It's at least ten times faster on average with Norton Navigator. No matter how many files you have. Or how big they are. In fact, the bigger the files, the more time you'll save.

6. Save another minute every time you delete, move, zip, or encrypt from any application's Open or Save dialog box. (Are you keeping count?)

7. One click is all it takes to access recently opened files or folders from any application. Now isn't that better than wading through folders?

8. Launch your favorite files, folders, or applications simply by pushing a button on the Norton Taskbar. No more going up and down to and from the Start menu over and over again.

NORTON NAVIGATOR FOR WINDOWS 95

NORTON NAVIGATOR ACCELERATES YOUR FILE MANAGEMENT IN WINDOWS 95.

Norton Navigator puts file management at your fingertips with Norton File Manager, Explorer Extension and FileAssist.

Norton Folder Navigator lets you open, copy, move or create a shortcut for any folder with just one mouse click.

Norton Taskbar features multiple desktops that let you organize your files and find your work faster.

Norton FastFind performs specific text string searches at least ten times faster than Windows 95.

9. With Norton Navigator, you can create a different desktop for each project. So you can find your work more easily. And save even more time.

10. Windows 95 supports long file names for all of your new 32-bit applications. Norton Navigator supports long file names for most 16-bit applications, too. So you'll never again have to remember what "billgbox" means.

MAKE WINDOWS 95 AN EVEN BETTER PLACE TO BE.

Well, there you have it. Our Top Ten. But try Norton Navigator for yourself and we're sure you'll find your own favorites. Because one of the greatest things about Norton Navigator is it lets you work the way you want to work. Needless to say, it comes with our standard 60-day money-back guarantee. So get your trade-up edition today.

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Science and History

From the Alamo to the Zoo

BY BRONWYN FRYER

Everyone in the family will get a kick out of **The San Diego Zoo Presents the Animals 2.0** *(Mindscape, $23 street, 800/234-3088, RSN 743)*, a well-designed tour of one of the world's best-loved zoological gardens. By clicking any of the bioclimatic zones in the disc's 3-D map, you can learn about everything from aardvarks to zebras through video clips, animal sounds, narration, text, and photos. For more general reference, the engaging **Eyewitness Encyclopedia of Nature** *(DK Multimedia, $54.95 street, 800/356-6575, RSN 744)* uses a Naturalist's Console to plug you into the world's major habitats. There are fun quizzes and an enlightening presentation on endangered species.

Take a virtual tour of a tropical rain forest in The San Diego Zoo Presents the Animals.

The family ornithologist may prefer **Birds of North America** *(Thayer Birding Software, $65 street; 800/865-2473, RSN 745)*. Once you get past the fifth-grade text to the birdsongs and colorful photos, the disc is worthwhile. You even get a listing of global hot spots for identifying birds (the Brownsville, Texas, city dump is a reliable place to view the Mexican crow) and tips for attracting yellow-bellied sapsuckers to your back yard. A deluxe version ($140 street) features a birder's diary to record sightings.

For explosive modern history, check out **The Day After Trinity: J. Robert Oppenheimer and the Atomic Bomb** *(Voyager, $29.95, 800/446-2001, RSN 746)*, a multimedia-rich enhancement to the award-winning video documentary about the creation of the bomb. Click the VCR-like controls to zoom in on the horrific details of Hiroshima, or fast-forward to review postwar U.S. atomic policy (in text or video).

Aging baby boomers can't help but groove to the two-disc **Haight Ashbury in the Sixties** *(Compton's New Media/Rockument, $49.95 street, 800/261-6109, RSN 747)*. Despite the jittery graphics and icons that don't always cooperate when clicked, this title is a must-have for sixties nostalgia buffs and grieving Deadheads. You can "Tune In" with a narrative history of the Haight scene, click a "Turn On" section for clips of a few famous Pauls (Kantner, McCarthy), and play "Drop Out," a sixties trivia game. Brimming with classic music, like The Jefferson Airplane's "White Rabbit," the discs provide an aural high.

Those who prefer less-psychedelic fare will get a thrill from another two-disc set, **The Alamo CD-ROM "Victory or Death"** *(Archimedia Interactive, $59.95, 800/925-2669, RSN 748)*. The discs use video, audio, and illustrations to bring urgency to a crucial moment in American history. This treatment of the famous Mexican-American War battle features voice-overs from Sissy Spacek, Dan Rather, and others, and the well-designed, sepia-toned title also features an awesome 3-D video flight through the fort. After viewing this disc, you will remember the Alamo.

Previously Reviewed FAVORITES...

A Passion for Art
Corbis Publishing, $49.95, 206/649-3997, RSN 749

Gadget
Synergy Interactive, $45, 800/734-9466, RSN 750

Let's Make a Word
Creative Wonders, $49.95, 800/245-4525, RSN 751

Microsoft Complete Baseball Guide
Microsoft, $34.95, 800/426-9400, RSN 752

Microsoft Complete NBA Basketball
Microsoft, $49.95, 800/426-9400, RSN 753

One Tribe
Virgin Sound and Vision, $39.99, 800/814-3530, RSN 754

Science Sleuths, volumes 1 and 2
Videodiscovery, $59.95 each, 800/548-3472, RSN 755

Under a Killing Moon
Access Software, $60, 800/800-4880, RSN 756

The Ultimate Frank Lloyd Wright: America's Architect
Microsoft, $34.95, 800/426-9400, RSN 757

Xplora 1: Peter Gabriel's Secret World
Interplay Productions, $50, 800/468-3775, RSN 758

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Travel

Desktop Adventures

BY JAMES A. MARTIN

It's never too early to plan your summer getaway, and a great place to begin is **Adventures** *(Cambrix Publishing, $29.95 street, 800/992-8781, RSN 759)*. An inspiring guide to offbeat vacations, Adventures offers detailed info on everything from a desert survival expedition in Israel to a cooking class at the Ritz. The videos are nothing to write home about, but there are lots of useful searching options.

For a more conventional escape, check into the **Everywhere USA Travel Guide** *(Deep River Publishing, $49.95, 800/643-5630, RSN 760)*, which provides a helpful, if slightly superficial, overview of some 3000 U.S. attractions, complete with large-format videos. You can easily browse the disc's contents by category (among the topics are arts, history, national parks, and science/nature), or perform quick custom searches based on your travel preferences.

With its interactive travel planner and animated weather charts, the **National Parks of America** *(Multicom, $49.95, 800/850-7272, RSN 761)* can help you pick the perfect place and time to pitch a tent. The disc's gorgeous color photos will instantly kick-start your camping fever as well. But don't confuse this classy CD-ROM with its hillbilly cousin, **National Parks: The Multimedia Family Guide** *(Cambrix Publishing, $19.95, 800/992-8781, RSN 762)*, a serviceable but uninspired reference that lacks its competitor's polish.

After you decide where you're going, you'll need to figure out how to get there. Among the half-dozen automated mapping programs, **TripMaker 1996 Edition** *(Rand McNally, W95, $39.95 street, 800/671-5006, ext. 500, RSN 763)* is your best bet. This latest version lets you get highly customized driving directions—one segment of a trip can lead you along the most scenic roads, for instance, while another segment takes you on the fastest routes. The 30 city photo panoramas allow you to scroll easily from one side of a city to the other. And the 27 video clips are hyperlinked throughout the CD's contents, making them accessible from multiple locations.

TripMaker 96 is a personalized tour guide, right down to providing customized driving instructions.

Breathtaking landscapes and heartrending tableaux are all part of the journey in Passage to Vietnam.

Don't fret if you can't sneak away for a major trip next year—via your CD-ROM drive, you can still blast off for any number of horizon-expanding virtual journeys. One of the best is **Passage to Vietnam** *(Against All Odds Productions, $39.95 street, 800/558-3388, ext. 700, RSN 764)*, an insightful and dazzling photographic exploration of this still-enigmatic, always-fascinating country (from the *Day in the Life* creators).

With a few mouse clicks, jump from Saigon to the plains of **Wild Africa** *(Sumeria, 415/904-0800, $49.95, RSN 765)*, a multimedia field guide to the colorful creatures in three of Tanzania's parks. On the way back from Africa, grab a cappuccino and spend some time with **Voyage Through Italy** *(E.M.M.E. Interactive, $59.95, 203/406-4040, RSN 766)*, a glorious romp through the country's history, art, architecture, and culture. The CD takes you on an interactive tour of Venetian palazzos and lets you explore Renaissance treasures of Florence, although the multimedia content is limited. Also, no practical travel information is provided—but as the subject is Italy, no one should expect practicality anyway.

Gregg Keizer is freelance writer based in Eugene, Oregon. Roberta Furger is a PC World *senior writer. Her two children, Michael and Jessica Kershner, road-tested products for this article. Michael S. Lasky and Lincoln Spector are senior associate editors for* PC World. *Bronwyn Fryer and James A. Martin are contributing editors for* PC World.

For more information on all products in this article, circle reader service number 908.

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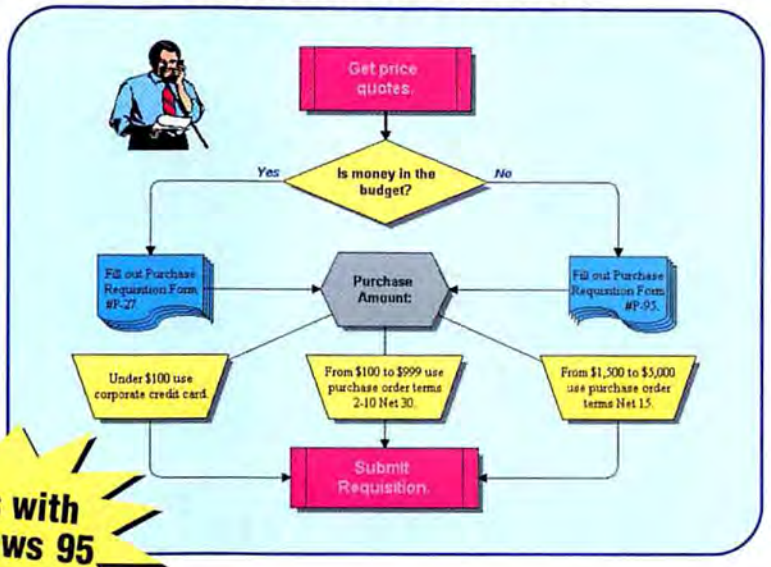

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No, I didn't get lunch. Or dinner. All I got was 13 hours with a pile of documents, each with its own set of editorial comments. Which meant I had to coordinate hundreds of comments on a dozen plans that had now become a rainbow of highlighter marks and chicken

Why the only thing I had to eat today was a week-old, slightly linty sourball.

scratches I could hardly read let alone agree with. So there I sat, page by page, plan by plan, muttering things under my breath while time passed and the sun went down and the cleaning guy packed

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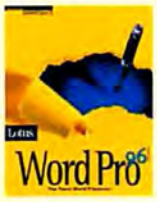

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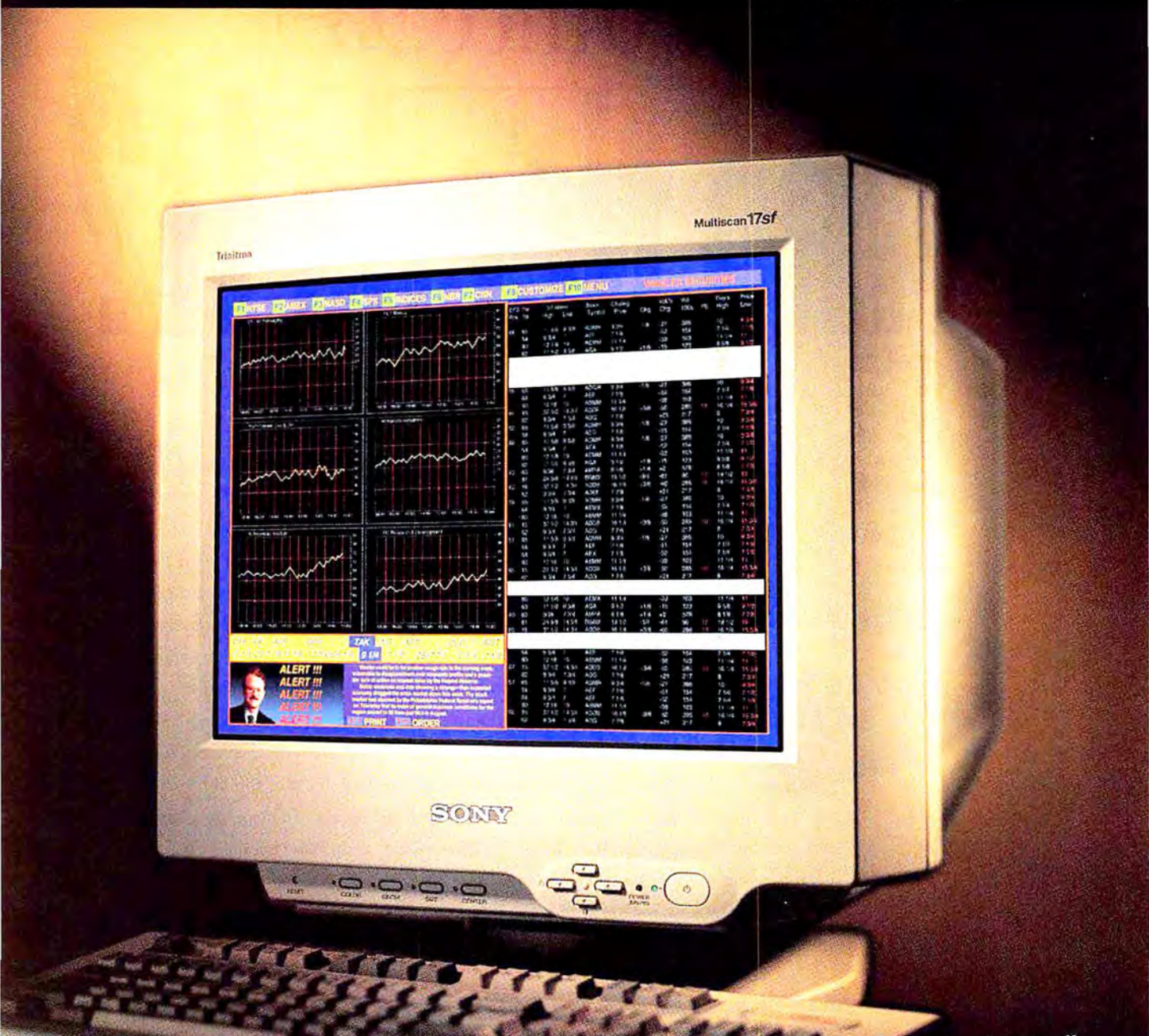

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SONY

Microsoft Office 95

Who Needs It?

Office 95 is the first Windows 95 application suite to hit the shelves. Is the decision to upgrade a no-brainer, or should you wait to see if Lotus and Novell catch up?

EDITED BY CATHY KENNY

By now you've probably come to a decision on the fate of your operating system. You've either (a) upgraded to Windows 95, or else you're (b) thinking about upgrading, (c) holding off for now, or (d) flatly refusing. Whatever the case, time is running out for your application software. As more vendors channel their development efforts into Windows 95, tried-and-true Windows 3.*x* applications are being left behind. But what exactly do these next-generation applications have to offer—and is it a compelling reason to upgrade?

Microsoft Office 95 doesn't have the kind of showstopping features that usually accompany a major software release. Except for Binder, its new compound-document tool, most of the enhancements are fairly simple, ranging from a supersmart spelling checker to a mapping utility. And performance is a mixed bag. Although Office 95 is a shade faster overall, parts of this huge suite of applications have actually slowed down—even on a fast PC equipped with plenty of RAM.

That said, devotees of the 16-bit version of Office will be pleased with many of the improvements in this release. Binder, although not perfect, is a big step toward successful document-centered computing. The many ease-of-use enhancements—Spell-It, AutoFormat, AutoCalculate, and AutoComplete—make it easier to create documents and work with them. In other cases, adjustments simplify unnecessarily complicated tasks. If you're already using Windows 95—and have invested in the hardware it really needs to operate efficiently—these improvements make

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upgrading to Office 95 worthwhile. But if you're not prepared to throw Office all the equipment it needs—we recommend a Pentium with 16MB of RAM—you should wait to see what the other office suites have to offer before deciding. Novell's PerfectOffice and Lotus's SmartSuite, both of which we will review when they ship, should give Office 95 a run for its money (see "Lotus and Novell: Their Own Suite Plans").

Second Impressions

When we first saw the beta version of Office 95 ("First Look: New Software for Windows 95," October), we were impressed by its Binder and its productivity enhancements but were concerned about the drain on system resources. For our current review of the shipping product, we took an in-depth look at the standard edition of Office 95 and put it through its paces in the PC World Test Center. These tests reveal that our initial misgivings about Office's performance were correct. The ease-of-use enhancements sprinkled throughout Office 95 do improve productivity, and the use of the Binder simplifies integration, but you'll want to weigh these advantages carefully against Office's less-than-spectacular speed.

The Office 95 standard edition consists of Word 95, Excel 95, PowerPoint 95, and Schedule+ 95. Office 95's professional edition, which hadn't shipped by our deadline, includes these applications plus Access 95.

Uneven Performance

To get an idea of the kind of performance increases that users on different platforms might expect when upgrading to Office 95, we tested both previous and new versions of the suite on a 486 DX2-66 and a Pentium-90. We ran tests with both the previous and current versions of Windows, and with both 8MB and 16MB of RAM.

Word users, especially those using a 486 system with 8MB of RAM, will be pleased with the boost they get from Word 95. In our tests, some operations in Word, such as loading graphic files and importing data for use with the mail merge feature, improved only a little. But scrolling and autoformatting long documents were about twice as fast, resulting in an overall Word performance increase of 40 percent on a 486 and 22 percent on a Pentium.

Office 95 did not fare as well in our other application-specific tasks, where we found the suite offered little or no improvement over its Windows 3.11 counterpart. Excel 95 offered quicker recalculation—up to 17 percent faster than Excel 5—but you'll need a Pentium to get that. PowerPoint's speed degraded almost across the board. In nearly all the individual tasks we tested, it was slower than the previous version. Another key area where Office 95 suffered was in the creation of compound documents, especially on systems running with 8MB of RAM. We did notice, however, that when other applications are loaded in the background, Office 95 handles tasks a little better than before.

One thing is clear: Running Office 95 on a 486 is tough going. Although you can get by on a 486 with lots of RAM, the faster the machine you can afford, the happier you'll be with Office's performance, especially when you've got lots of applications loaded at once. As for a hard drive, the bigger the better. The installation will cost you anywhere from 28MB to over 100MB in hard disk space, 20 megabytes more than before. In addition, if you want to make use of the multimedia goodies in PowerPoint, such as sound and video clips, you'll need a CD-ROM drive and sound board.

United They Stand

When application suites were first introduced, they served one purpose: to give software companies a way to distribute their products en masse at a low price. The next phase aimed to make sure the applications looked alike. Now the focus is on how well the applications actually work together.

Office 95's integration is less than perfect, mainly due to the inability of Schedule+ to share information with the rest of the suite. Still, it's the best integration we've seen in a suite so far (see "Office Integration"). The Binder paves the way to a new level of integration by letting you stash documents from different applications in a single file. Office 95 has also jazzed up its support for OLE 2.0 to make it easier to share data among applications. Before, you could drag and drop between apps, but each had to be open and visible on screen. Now, you can simply drag and drop data onto minimized taskbar icons.

Office 95's applications have a more uniform look and feel to them, and they share more features, such as AutoCorrect and the Answer Wizard. The Office Shortcut Bar is a big improvement over the Microsoft Office Menu and offers single-click access to all the programs and files on your PC.

Making the Switch

So should you give up what you know and go with Office 95? If you can wait, it may be worth holding off until Microsoft has fine-tuned its applications, particularly if you're a PowerPoint user. But if you create a lot of compound documents and share them with colleagues, then the Binder feature alone may be reason enough to switch. And if you live in Word or Excel, you'll enjoy the nice touches that have been added. Just make sure you've got the horsepower.

Should You Buy Office 95?

YES

IF you've already upgraded to Windows 95

AND you have a Pentium-class machine with at least 16MB of RAM

AND you rely heavily on Word or Excel, or you want to share documents with a group of other Office 95 users

NO

IF your decision to upgrade to Window 95 hinges on major improvements to Office (it's not worth switching operating systems to get them)

OR you're looking for a substantial boost in performance, particularly if you are a PowerPoint user

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Word 95 Boosts Your Productivity

WHAT'S HOT

Improved file management, on-the-fly spelling checker, automatic formatting, Address Book, find and replace all word forms

WHAT'S NOT

No page border tool, doesn't use Visual Basic for Applications

At first glance Word 95 isn't noticeably different from its Windows 3.*x* predecessor. In fact, the program's core remains essentially the same as in version 6; what's really nice is that it even uses the same file format. In this first release for Windows 95, you'll find a handful of features that make the program easier to use—including a spelling checker that works as you type, and a help system that lets you ask questions your way.

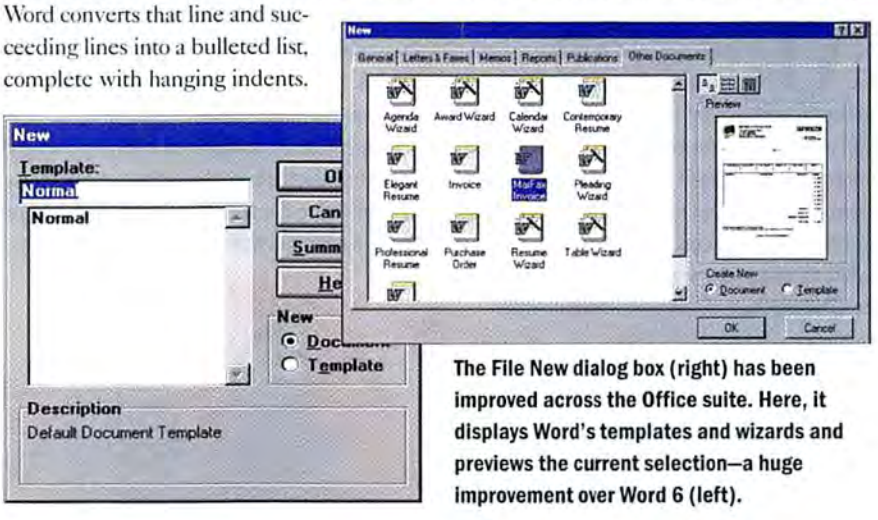
Making It Easier

One of the biggest improvements you'll find in Word and across all the Office 95 applications is the addition of common dialog boxes. The File Open dialog box has been greatly enhanced and proves itself a capable document manager. In addition to opening files, you can also rename and print them, create new folders, and copy files from one folder to another. You can display the contents of a document in a preview window before you open the file. The Find File feature is now incorporated right into the dialog box. You need only to type in part of the file name, or some text from the file, and click the Find Now button to locate the file.

The File New dialog box has also been enhanced. It uses a tabbed display of icons, showing document templates and automated wizards categorized by document type. These templates and wizards are much more plentiful and easier to use than those in Word 6. For example, to complete the invoice template, just click on the shaded areas and enter the information; the calculations are automatic.

Once you're working on a document, new and improved features simplify even mundane jobs like typing. The AutoCorrect feature, which fixes common typos as you make them, has been significantly enhanced. For starters, it now includes 350 default entries compared with the previous 12. It also corrects errors caused by accidentally typing with <Caps Lock> pressed, and it no longer makes false corrections of words like *PCs* or *MHz*. You can also add your own frequent typos to the list as well as define a list of exceptions. Furthermore, AutoCorrect now appears in Excel and PowerPoint, so new words you add to the list will appear in those applications as well.

The AutoFormat command has also been greatly improved. Similar to the AutoCorrect command, it too works as you type. For instance, if you enter any symbol character (such as >) at the beginning of a line, Word converts that line and succeeding lines into a bulleted list, complete with hanging indents.



The File New dialog box (right) has been improved across the Office suite. Here, it displays Word's templates and wizards and previews the current selection—a huge improvement over Word 6 (left).

Similarly, starting a new line with a number followed by a period or close parentheses switches you to numbered-list mode. Type a short line of text without a period, and Word will format that line as a heading.

Word's best new editing feature is Spell-It, which checks the spelling of each word as you type and highlights unknown words with a wavy red underline. Right-click the word and you'll see a list of proposed replacements. Select one for an instant correction, or add the word to the user dictionary. Although Spell-It doesn't use Windows 95's multithreading, it works completely in the background. Even my 100-word-per-minute typing rate didn't faze Spell-It at all.

If you dislike automatic features such as these, you can turn all or part of them off in the Options dialog box.

Other ease-of-use features are more subtle but remedy some longtime irritations. For instance, pressing the <Tab> key while multiple paragraphs are selected indents those paragraphs on the page rather than deleting them. Likewise, when you press the <Tab> key at the beginning of a sentence, Word indents the line instead of inserting a tab character. Perhaps even more important, backspacing over paragraph marks no longer affects the formatting of other paragraphs. However, it is still quite difficult to drag and drop a precise block of text in Word—scrolling is way too fast.

A Tutor for Everyone

Word 95 provides plenty of help options for new and experienced users alike. The TipWizard, a feature that Excel users will recognize, keeps watch as you work and provides many contextual tips on how to do tasks faster or smarter. If you need more help, you can consult the Answer Wizard and ask for help in your own words. Just type in a question, and the Answer Wizard shows you a list of related help topics. I liked this feature but found it inaccurate at times. The list

often included irrelevant help topics, and if you ask a question about an unavailable feature, Word may mislead you by presenting help topics even though no answer exists. There's a full-scale, task-oriented help system as well, and you'll need it, since Microsoft provides only a slim manual to show you how to create specific document types. Lastly, you can connect to the Word support forum on Microsoft Network directly from the Help menu.

Working Together

The new Address Book feature offers a quick and easy way to access names and addresses from your contact manager right from Word. The Address Book is integrated with Microsoft Exchange and Schedule+ so you can quickly access contact information from either application. To access an address or group of addresses, just click the Insert Address tool, select the address book you want to use, then select the contact name. If you're creating form letters with the mail-merge function, specify your Schedule+ contact list or Personal Address Book as the data file. While this feature is a welcome addition, I would also enjoy the ability to simply drag and drop a contact name from Schedule+ directly into a Word document.

Through a separate installation procedure, Word 95 can also serve as the front end for Microsoft Mail, replacing the Microsoft Exchange editor. You can still use Word as usual, but you can now use its extensive editing and formatting features to jazz up your messages. Similarly, the Internet Assistant, a free add-on for Word, provides full read and write capabilities for HTML Word Wide Web documents.

Word 95 has some minor improvements in the workgroup arena. A 16-color highlighting tool lets you mark portions of documents, which facilitates group editing when used in conjunction with the revision marking tools. You can also indicate a dedicated file directory for document templates, so you can access templates from both your hard disk and shared network drive. While these features aren't as extensive as those in Lotus's Word Pro—namely Word Pro's TeamReview command, which lets you send a document to a group of users for editing and then incorporate those changes into

Lotus and Novell Their Own Suite Plans

Microsoft Office 95 may have a head start on the competition, but don't count Lotus and Novell out of the race yet. Although their products weren't available for review, we did manage to get a look at a beta copy of Lotus SmartSuite, and sources at Novell filled us in on what to expect from the next PerfectOffice. From what we've seen and heard, it's definitely worth your while to wait and see what these products have to offer before you make your final decision.

SmartSuite 96 Edition for Windows 95

Lotus SmartSuite 96 Edition for Windows 95, which should be available by the time you read this, sports the radically overhauled Word Pro (née Ami Pro) and 32-bit versions of Freelance Graphics and Approach. SmartSuite 96 is still behind the eight ball, though, as it includes 16-bit versions of 1-2-3 and Organizer. A 32-bit version of 1-2-3 is expected in the first half of next year, but there's no word yet on upgrade plans for Organizer.

Still, SmartSuite does offer some significant enhancements, most notably in the team computing area, where neither Office nor PerfectOffice can touch it. If you rely heavily on members of a workgroup to get your job done, Word Pro and Freelance Graphics sport a TeamReview feature to facilitate group editing. In Word Pro you can use this feature to send a document to a group of users for editing, then use TeamConsolidate to bring the edits together in a single file. In Freelance, the TeamReview feature lets users annotate slides with comments.

SmartSuite also improves upon its integration: The interfaces of the various applications are now more consistent, with similar menus, dialog boxes, and right-mouse-button behaviors.

SmartCenter, the suite's command post, has been greatly enhanced as the central location for accessing your work. Its new file cabinet drawer interface makes it better organized, and you can now include icons for non-Lotus applications as well as for documents, cross-application templates, Notes databases, and even Internet connections.

OLE 2.0 is supported throughout the suite's major 32-bit applications so you'll be able to drag and drop information between Word Pro and Freelance, for example. LotusScript, the long-awaited scripting language, will be supported only by Word Pro, Approach, and Freelance in the initial SmartSuite release.

PerfectOffice for Windows 95

Novell's PerfectOffice for Windows 95, due to ship in the first quarter, is also shaping up to be a big improvement. Its command center, Desktop Applications Director, is still the most versatile of the application suites, letting you add and carry out timesaving cross-application macros. It also sports a tabbed interface, making it much easier to access multiple toolbars.

PerfectOffice's applications now share a lot more code and tools as well as a more consistent interface. Each application will provide client and server OLE support, making it possible, for instance, to drag a chart directly from Quattro Pro into WordPerfect. Only WordPerfect, Quattro Pro, and Presentations, however, will have the scripting language PerfectScript.

—Reid Goldsborough

the document—they're more than adequate for a small group.

Problems and Omissions

Some old problems and awkward features still remain in this version of Word. For example, placing a border on a page is still unnecessarily complicated, involving headers, watermarks, and manually drawn borders. Some old bugs involving the Grammar Checker and the saving of documents to floppy drives still exist as well. Word 95 also lacks Visual Basic for Applications, as opposed to other Office applications. Instead, WordBasic gets a few new commands.

We've all been expecting improved performance from 32-bit applications written for Windows 95, but Word's results are a mixed bag. Users who work with Word alongside other applications will certainly appreciate Windows 95's better use of resources. You no longer have to worry about resource-based crashes when using Word with other large applications like Excel.

Word takes some advantage of Windows 95's multithreading capability for its printing and file-finding functions, but it frustratingly skips it for mail merges, which still tie up Word until the whole job is done.

On the upside, Word 95 was able to AutoFormat a 175-page document, an ad hoc test of ours that failed in Word 6. This suggests that Word 95 is indeed better than before at handling large, complex tasks, but you'll need to feed it plenty of RAM.

Despite some remaining problems, the usability enhancements in Word are very attractive. These new features, combined with other features in Office 95 (particularly the Binder), make an upgrade enticing. Since I use a fast 16MB machine, I'll probably upgrade to Word 95 for the Spell-It, enhanced AutoFormat, and Address Book features alone. But users who normally deactivate such features, and those with slower PCs, should simply continue using Word 6 until Microsoft upgrades Word 95's core and fine-tunes its performance.

—George Campbell

Excel 95 Eases Your Spreadsheet Chores

WHAT'S HOT

AutoCalculate, AutoComplete, AutoFormat, shared lists, Template Wizard, mapping utility, Access integration, improved macro help

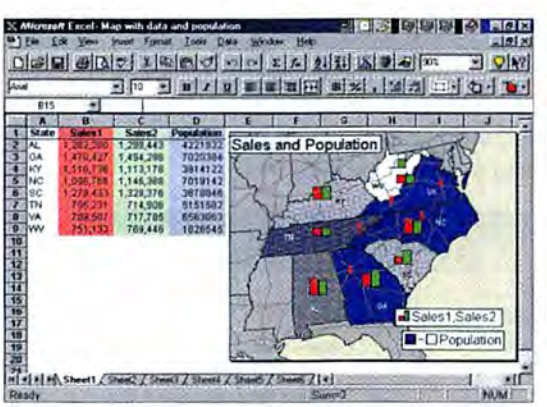
WHAT'S NOT

Inability to route a worksheet range, no new Visual Basic commands

As the first Windows 95 spreadsheet out the gate, Excel 95 is not quite the revolutionary critter that Microsoft's propaganda machine makes it out to be. What you will find is the next evolutionary stage in the best spreadsheet product available. Novell and Lotus are going to have to work that much harder to catch up to some slick new interface enhancements in this version of Excel.

Touchy-Feely Tasks

Excel 95 may look and feel like Excel 5, but there are some enhancements that make it even easier to learn and use. For instance, a little box on the status bar displays the sum, count, or average of any range you select—no formula required. The scroll bar has also been improved, providing better visual feedback. The scroll boxes change size according to the worksheet's height and width. And an indicator, just like Quattro Pro's, tells you which row (or column) will appear at the top (or left) of the window.



Excel 95's mapping utility helps you make more sense of demographic data by letting you overlay highways, states, and bar charts to clarify information.

A few other handy features ease the drudgery of data entry but can be both a blessing and a curse. For instance, as you begin to type a new entry in a column, Excel scans the entries already in the column and pops up a matching value based on the characters you type. If you want the value that appears, just press <Enter>. You can also activate a pick list to select from a list of unique values. Then there's AutoCorrect, the on-the-fly typo corrector that many users will recognize from Word 95.

Excel's AutoFilter broke ground when it first appeared in version 5. Now AutoFilter proves to be even more useful for list management: It automatically generates a top-ten list based on column values.

Other enhancements are simply improvements to existing features. For instance, thanks to a simple redesign of the Numbers tab in the Format Cells dialog box, you no longer have to grapple with arcane codes when you want to pick a numeric format. You simply choose from a list of examples based on your own data. Excel's cell notes are another great feature, but until now it wasn't apparent how to access them. Now you simply hover your mouse pointer over the cell containing a note, and it automatically pops up, just like a tool tip.

But there are still a few fossils lurking about. The File Name box in MS Query is still too small, and you can't see long file names when you're using Excel 95 workbooks. You can't access a directory tree when you want to set the default document directory. And formulas lose their references when you move them from one workbook sheet to another sans data.

Of Maps, Workgroups, and Macros

Maps are the happening thing in spreadsheets these days, and Excel 95's got the

best ones so far. Excel's maps are richer and a lot easier to use than those in 1-2-3. Implemented via an OLE-based add-in from MapInfo Corporation, Excel's maps include overlays for highways and major cities, and flexible formats for displaying data with maps. And they're more intuitive. For example, once you've created a map, you can simply double-click to edit the map title. In 1-2-3, you must search for a buried dialog box to change the title text.

Get to work right away with Excel's fill-in-the-blank templates. In this loan table, enter the amount, term, start date, and interest rate, then Excel does the rest.

But when it comes to overall workgroup functionality, 1-2-3 is still more highly evolved. Excel's new Shared Lists feature allows more than one user to make changes to a worksheet at the same time, and then referees any conflicts. But unlike 1-2-3's multiuser sophistication of Notes-based e-mail and range routing, Excel requires that the worksheet be placed on a shared network drive and alerts the user of changes only when the file is saved. Excel lets you send a worksheet via MAPI e-mail or the Microsoft Network, but unlike 1-2-3, it only allows you to send the entire worksheet instead of a particular range.

Although you won't find any major improvements to Visual Basic for Applications, there are a number of slight enhancements. The Help system really helps now, with descriptions and examples that are actually intelligible, and you can keep the Debug window open while you edit and test macros. Of more interest to the hard-core developer are the new Data Access Objects, which replace the XLODBC commands.

Worksheets Without the Work

"I need that loan amortization right now—who's got time to figure out a bunch of %$*@&= formulas?" If that's your dilemma, bypass the blank worksheet and open one of the ten Spreadsheet Solutions templates included in Excel 95. These predefined templates cover basics ranging from expense reports and invoices to a car lease analyzer and a business plan worksheet.

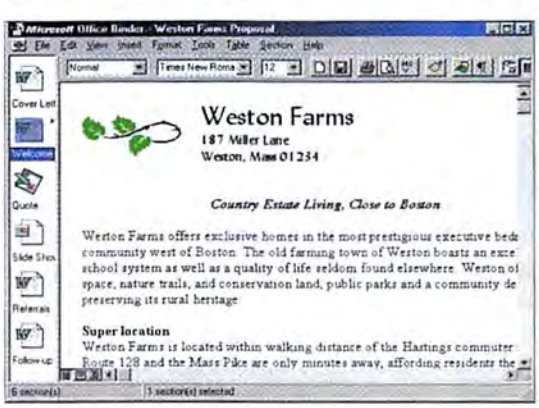
The templates are similar to what you'll find in 1-2-3 and Quattro Pro, but Excel 95 adds its own special twist. The Template Wizard enables you to hot-wire your worksheets to a database file. The end result is

Office Integration

The applications in Office 95 do more than look and act the same; they are more tightly integrated than ever before. Based on what we've seen, Office 95 has set some pretty high standards in terms of the way the applications work together.

The best new integration feature in Office 95 is the Binder. Similar in function to the three-ring binder you used in high school, the Binder allows you to assemble a single file of related documents, regardless of the application in which they were created. For instance, you can create a marketing report composed of pages from Word documents, Excel spreadsheets, and PowerPoint charts. When the time comes to share work with colleagues or print the report, you need only the single file rather than a handful of separate ones.

The Binder is an innovative solution to the age-old problem of collecting separate documents into a single file. But we ran into some minor foibles that reveal the Binder is still in its infancy. Since the Binder is based on OLE 2.0 functionality, you are prohibited from using certain commands. For instance, you can't display an application's status bar, nor can you use the Zoom or Print Preview command. In Word, you can't use the mail-merge function or access the envelope and label features. Instead, you must use the View Outside command to switch to a full copy of the application and work with the file there. In addition, if you double-click the icon of an active Binder file, Office opens a new copy of that file rather than switching to the active version.



The Binder assembles a number of documents in one file. Here, the narrow left pane lists the files, and the right pane displays the selected document in its originating application.

The Binder handles Word, PowerPoint, and Excel files, in addition to a selection of third-party Office-compatible applications such as Micrografx ABC Graphics Suite and Visio 4.0. The Binder does not accept files from competing applications, such as a 1-2-3 worksheet or a WordPerfect document; however, you can import a 1-2-3 worksheet into an existing Binder document via the Insert • Object command.

Quicker Access With the Shortcut Bar

The Office 95 Shortcut Bar replaces the somewhat anemic Microsoft Office Manager from version 4.3—it is easier to customize and has more functions. But it's not immediately clear why you need this toolbar in addition to the Start menu. In fact, the Start menu is actually less obtrusive than the Office Shortcut Bar (which automatically installs itself in your Startup folder, forcing you to wait for it to load each time you turn on your PC).

However, the Shortcut Bar is still fairly compact and offers quick access to all the programs and documents on your PC. A number of specialized tools put key Office

that each time you save data in a template, it is added to the database file instantly.

Should You or Shouldn't You?

How different is all this from running Excel 5 under Windows 95? For most users, not a whole lot. The new features are welcome, but they're no reason to line up at the software store at midnight. The Template Wizard and maps will strike a chord with many users, though. And if you're a developer, the new macro help alone is worth the upgrade. But if you're looking for a huge performance boost you'll have to wait. While Excel's recalculation engine has been rewritten for the 32-bit environment, the improvements are nothing to write home about.

If you're a new user, or if you're considering an upgrade with new users in mind, then this release promises some truly significant benefits. My guess is that the white-knuckle crowd will find Excel 95 a lot less intimidating than they did its ancestors.

—Richard Scoville

PowerPoint 95 Gets Animated

WHAT'S HOT

Meeting Minder, sound and animation special effects, AutoClipArt, automatic style checker

WHAT'S NOT

No slide miniatures in Outline view, slower than before

Of all the applications in Office 95, PowerPoint offers the most significant improvements in features, especially when it comes to on-screen presentations. PowerPoint 95 sports a number of new multimedia features to make it easy for both the veteran and the first-time user to turn a standard business presentation into a lively event complete with animation and sound.

Enliven Your Presentations

One of PowerPoint's biggest deficiencies had been its lack of multimedia tools and screen-show controls, which were better handled by competitors such as Lotus's Freelance Graphics and Software Publishing Corporation's Harvard Graphics. But not any more.

PowerPoint's new Animation Effects toolbar enables you to add new build effects (such as flying from the right and flashing once) and ready-made sound effects (applause, drum roll, and explosion) to text and

features within easy reach. For instance, the New Office Document tool summons a dialog box from which you can create a new Word document, PowerPoint presentation, or Excel spreadsheet. Other tools let you send a fax or e-mail with Microsoft Exchange or schedule an appointment in Schedule+.

The Shortcut Bar actually consists of six predefined, color-coded toolbars you can choose from. You can add all six toolbars to your Shortcut Bar; Office automatically minimizes each one until you need it. In addition, you can easily add your own tools for quick access to a program, folder, or file created in Office or a third-party app. Or you can create a new Shortcut Bar. It's a simple matter of drag and drop.

Integration Is Key

For the most part, interface elements such as menus and toolbars are consistent across Office 95. In addition, the applications have much more in common than before. Features previously available in a single application, such as AutoCorrect and TipWizards, have been extended to the other applications.

Microsoft has also implemented many new ease-of-use features across the board, including ScrollTips, which display the page number in Word, the row or column number in Excel, and the slide number in PowerPoint when you use the scroll bar. The Answer Wizard has also been implemented in each of the Office applications. Most of the applications now share the same dialog boxes as well, such as File New, File Open, File Save, and File Print.

Office Professional, which is due out by the time you read this, offers even greater links between applications, namely Access and Excel. Excel can use Access to create forms and reports for data in a spreadsheet range, a feature that duplicates what's been available in 1-2-3 and Approach for some time. But Office Professional goes way beyond what's currently available in SmartSuite. For starters, you can use Excel's Pivot Tables to summarize Access data, either via the MS Query connection or from the Access side. However, my prerelease copy of Access ran a bit on the slow side. You can also transfer your data directly from Excel to Access via a wizard that will even convert your spreadsheet data into a set of relational tables.

However, the consistency among Office 95's applications isn't as complete as it could be. Only Word allows unlimited undo. And only Excel (and Access, if you're using the professional version) provides support for Visual Basic for Applications—Word and PowerPoint will have to wait until the next Office release. In addition, Schedule+ is a step behind the other applications in key areas—especially integration.

—Reid Goldsborough

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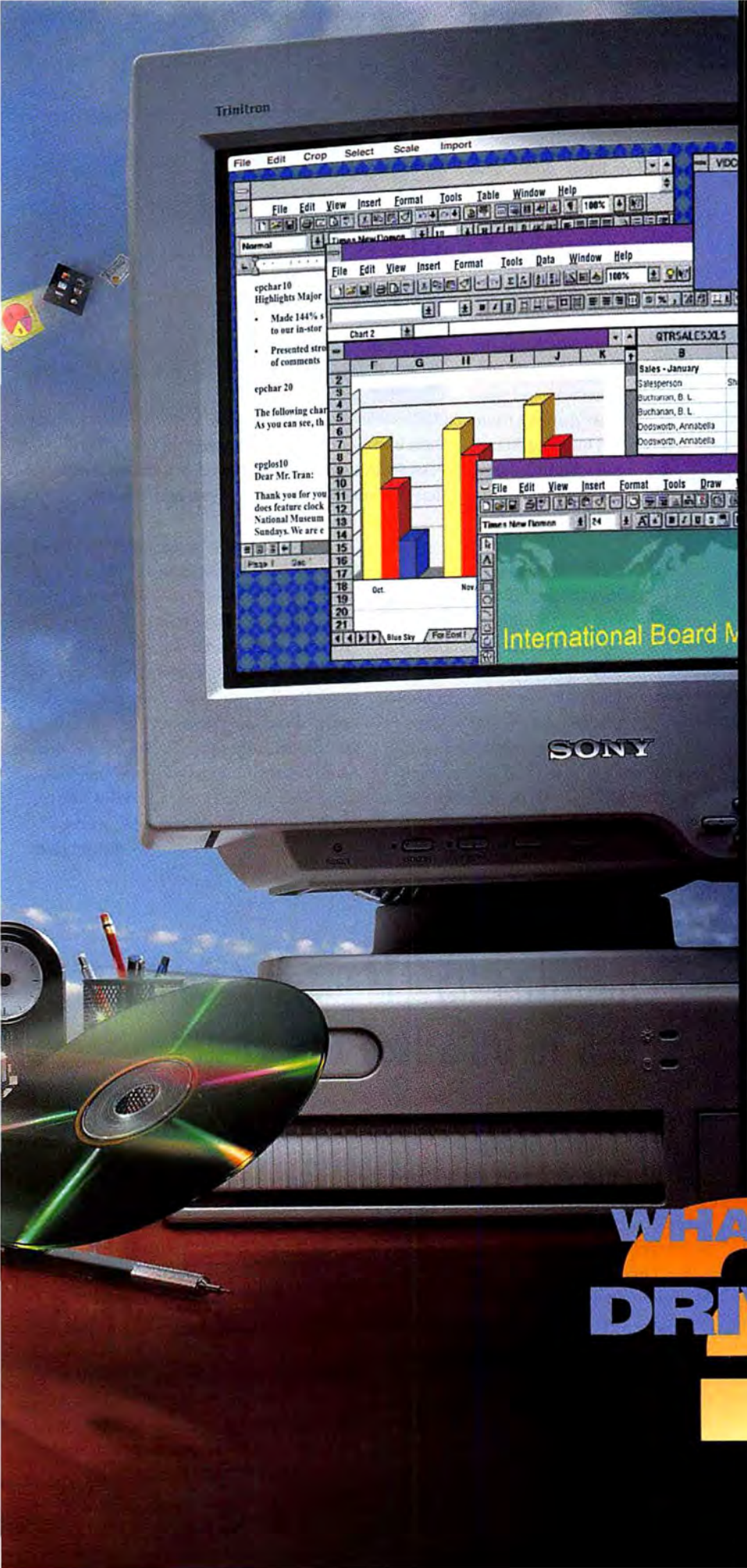

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objects and control the effect sequence. There's also a time gauge to monitor progress while you practice, a control panel to skip to any slide during a show, and a conference feature that lets you deliver your presentation across a TCP/IP network.

With the new Meeting Minder feature you can record notes, meeting minutes, or action items during a screen show. Later you can add them to your speaker notes, export them to a Word 95 document, or automatically add them as the last slide in the presentation. Although Meeting Minder is not designed as a multiuser tool (as is Freelance Graphics 96's TeamReview, which allows coworkers to add comments directly to a slide), a workgroup could easily adapt it to collect comments and changes.

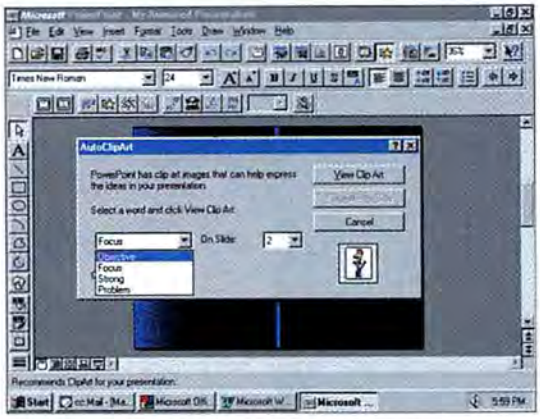
PowerPoint 95's Animation Effects toolbar lets you add transition effects to text and objects. The Slide Miniature shows you how your slides will look in black and white.

Unlike Word and Excel, PowerPoint uses a different file format than its Windows 3.*x* counterpart. You're still able to share files with users of earlier versions, but your presentation will lose any new animation effects and Meeting Minder notes.

Help Is on the Way

PowerPoint has also implemented a number of help tools and automatic aids for both novices and advanced users. These include ScreenTips, which pop up whenever you hold the cursor over a button or function; enhanced Cue Cards, which provide step-by-step answers and visual guides; and the Answer Wizard, which lets you ask for help in your own words.

The AutoContent Wizard has been beefed up to include more choices for pre-designed presentations, but it doesn't offer as versatile a selection as Freelance does. The new StyleChecker looks over a presentation and flags design problems but doesn't help you correct them, unlike Harvard Graphics 4.0's design checker. The AutoClipArt command scans the slides in your presentation and suggests graphics (from the bundled Microsoft ClipArt Library) to help communicate ideas.



Don't have a graphical bone in your body? Let PowerPoint's AutoClipArt feature pick a graphic image that best expresses the ideas in your presentation.

Performance Suffers

PowerPoint 95 supports Windows 95's multithreading capability in addition to standard features like long file names and OLE 2.0 support. For example, you can print in the background while you continue working on another job. You'll also find the slide sorter more responsive—you no longer have to wait for the thumbnail screen to redraw before moving on to another task.

However, our tests reveal that PowerPoint 95 is slower than version 4. This is true whether you're using it on a 486 or Pentium with 8MB or 16MB of RAM.

If you spend a large portion of your time preparing on-screen presentations, upgrading to PowerPoint 95 is worthwhile just because of the program's enhanced interface and multimedia options. But if you deal mainly with printed slides and handouts, some ease of use is not a good incentive, considering the decrease in performance .

—Richard Jantz

Schedule+95 Managing Contacts and To-Do's Just Got Easier

WHAT'S HOT

Contact manager, To-Do manager, Meeting Wizard, tabbed view display

WHAT'S NOT

File incompatibility with previous version, inability to create your own displays, lack of drag-and-drop functionality between sections and other Office 95 applications

While Schedule+ 95 is a more well-rounded personal information manager than its predecessor, it's not nearly as robust as competing PIMs like ECCO, Lotus Organizer, and SideKick. More important, the file format is not backward compatible, so you can't share information with users of earlier versions of Schedule+ or include them in your group meetings. Schedule+ 95 is not very well integrated with the rest of the suite either, but instead relies on import commands and on other applications to facilitate sharing. If you're a dedicated PIM user, you're better off sticking with what you have for now. On the other hand, if you haven't yet decided on a PIM, Schedule+ at least warrants a look.

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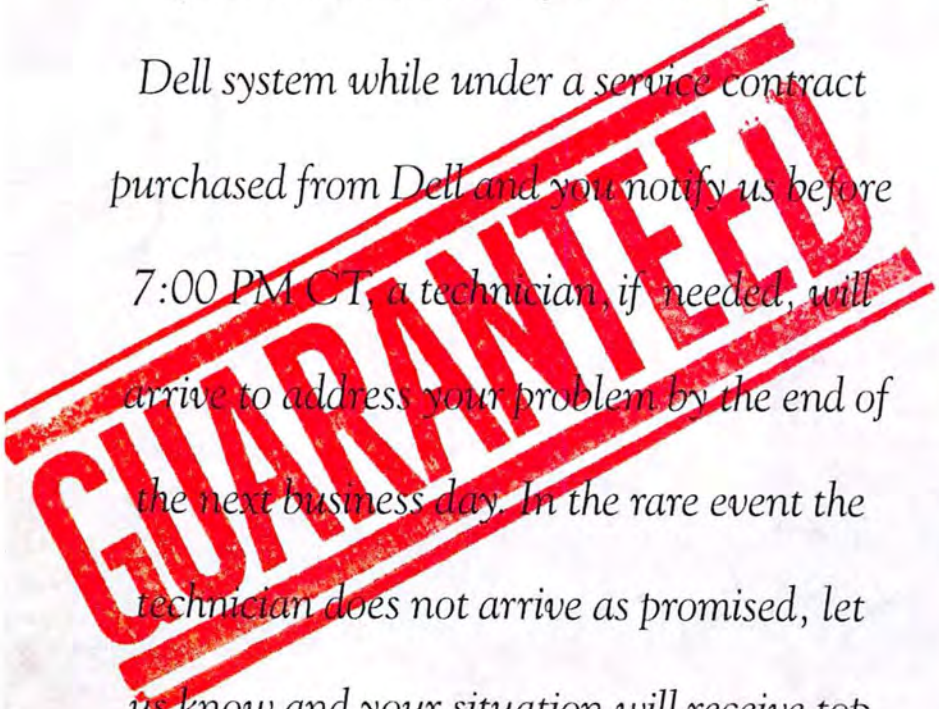

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Keep Track of Time

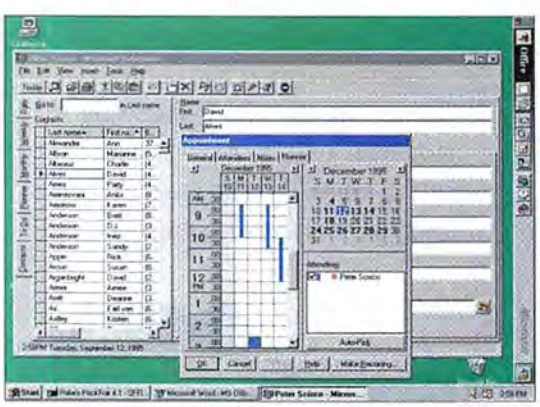
No matter how hard you try, you can't get organized unless your organizer is easy to use. Schedule+ 95 passes this test with flying colors. A single screen displays your daily to-do's and appointments, and a set of tabbed section heads allows you to quickly switch to a different view. However, unlike with other PIMS, you cannot customize or create your own tabbed views.

Users of previous versions of Schedule+ will have no problem adopting the new version. To make the transition easier, you can import your old Schedule+ information, and the extensive online help will get users acquainted with the program.

Managing Contacts and To-Do's

The Contact Manager and To-Do sections are welcome additions to Schedule+, but they haven't quite caught up to their competitors. The ability to see your contact information in list and form views is a nice touch, and the use of tabbed entries leaves plenty of fields for recording business and personal information. But you can't create multiple contact lists, which is a drawback if you want to separate business contacts from personal contacts.

A more serious flaw is the inability to establish links between your contacts and other items in Schedule+. While you can associate an appointment or task with a contact, you can't view the information from the Contact Manager but must switch to the To-Do or Calendar view. In addition, you can't link documents and other files to another item. So you won't be able to keep correspondence together with related items.



The integrated yearly planner in Schedule+ makes it easy to set an appointment with any of your contacts.

The To-Do manager is a little better. The types of information you assign to a task are similar to what's available in dedicated project management software. For instance, rather than creating a task and assigning a priority, which is the extent of other PIMS, you can assign tasks to a specific user and estimate how long it will take to complete the task, how far along it is, and other criteria. You can then view the position of a task and determine its status.

But the To-Do manager suffers the same lack of integration as the rest of Schedule+. If, for example, you set a task entry to 'call Bob Smith', you can't dial the number from there. Instead, you must switch to your contact manager, look up the name, and then make your call.

The Planner section is not quite up to snuff either. It is better suited for display purposes or for use with the group scheduling feature. For starters, it displays appointment information only; you can't view events such as a training seminar or a vacation day. Furthermore, you can't access appointments from the Planner but instead must switch back to the Calendar section if you want to make any changes. Even more frustrating, you can't drag and drop an appointment from one day to another.

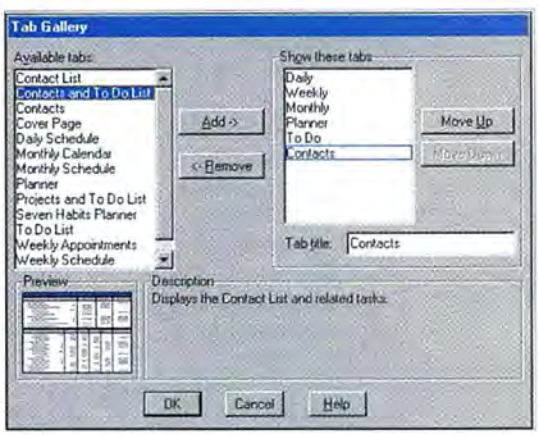
Better Group Scheduling

One major improvement you'll find in Schedule+ is the Meeting Wizard, a feature that steps you through the laborious process of setting up a group meeting. You simply tell the Meeting Wizard the names of those invited, the location, the resources you'll need, the projected length, and the acceptable time and day for the meeting to take place. The Meeting Wizard then checks the schedule of each invited attendee and comes up with a prospective date that works for everyone. You can either accept the meeting time, or reject it and search for another suitable time slot. In addition, if your colleagues have provided public access to their schedules, you can view the schedules quickly with a simple click of the right mouse button.

Schedule+ 95 has one major scheduling problem, however. You can't use it to arrange meetings with members who are using the previous version of Schedule+.

Integrating Into the Office Family

Schedule+ 95 seamlessly integrates into the main Office toolbar, giving one-click access to often-used PIM activities such as adding contacts to an address book or appointments to your schedule. Given the sometimes annoying Windows 95 allegiance to the Start menu, this is a welcome shortcut.

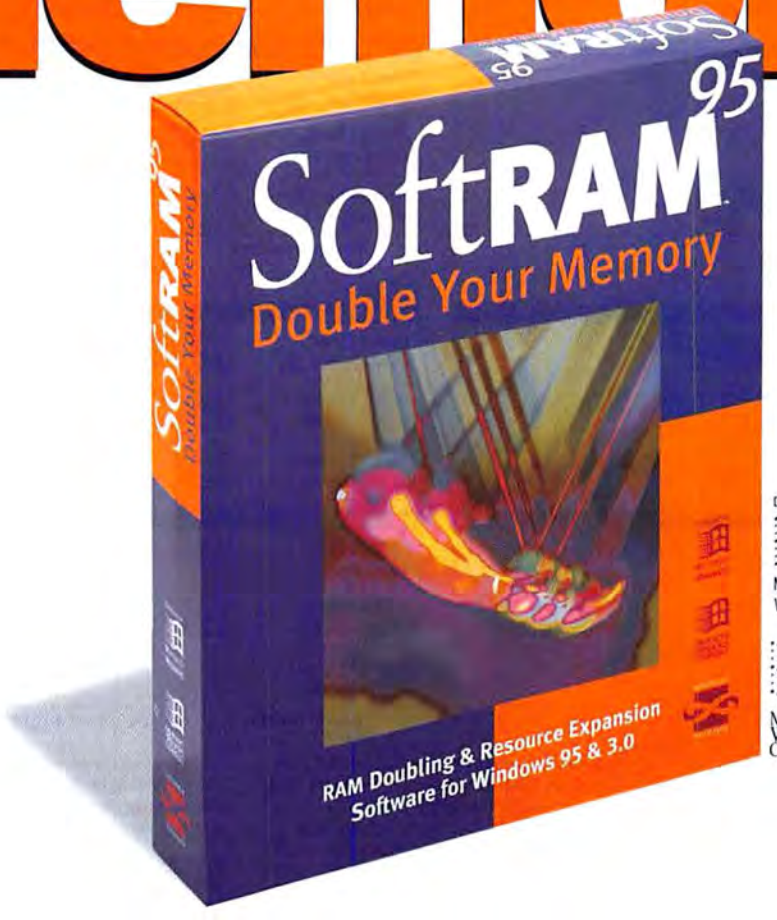


Schedule+ includes a number of predefined tabs from which you can choose to display your data.

One puzzling inconsistency, however, is that the icons in the Office toolbar are different than those found in Schedule+. And unlike toolbars in the other Office 95 applications, the Schedule+ toolbar can't be customized. While the program's relative simplicity doesn't mandate an extensive array of icons, this inability to customize suggests that Schedule+ remains a pinch hitter in the Office lineup rather than a team player.

But inconsistent icons is a minor irritation compared to the lack of drag-and-drop functions between Schedule+ and the rest of the Office applications. To compose a letter to one of your contacts, for example, you can't drag a name from the contact list into an open Word window, nor can you drop a name onto the taskbar, as you can with the other Office applications. Both choices seem rather intuitive, and it's surprising that Schedule+ doesn't work that way within the

double click. double memory.



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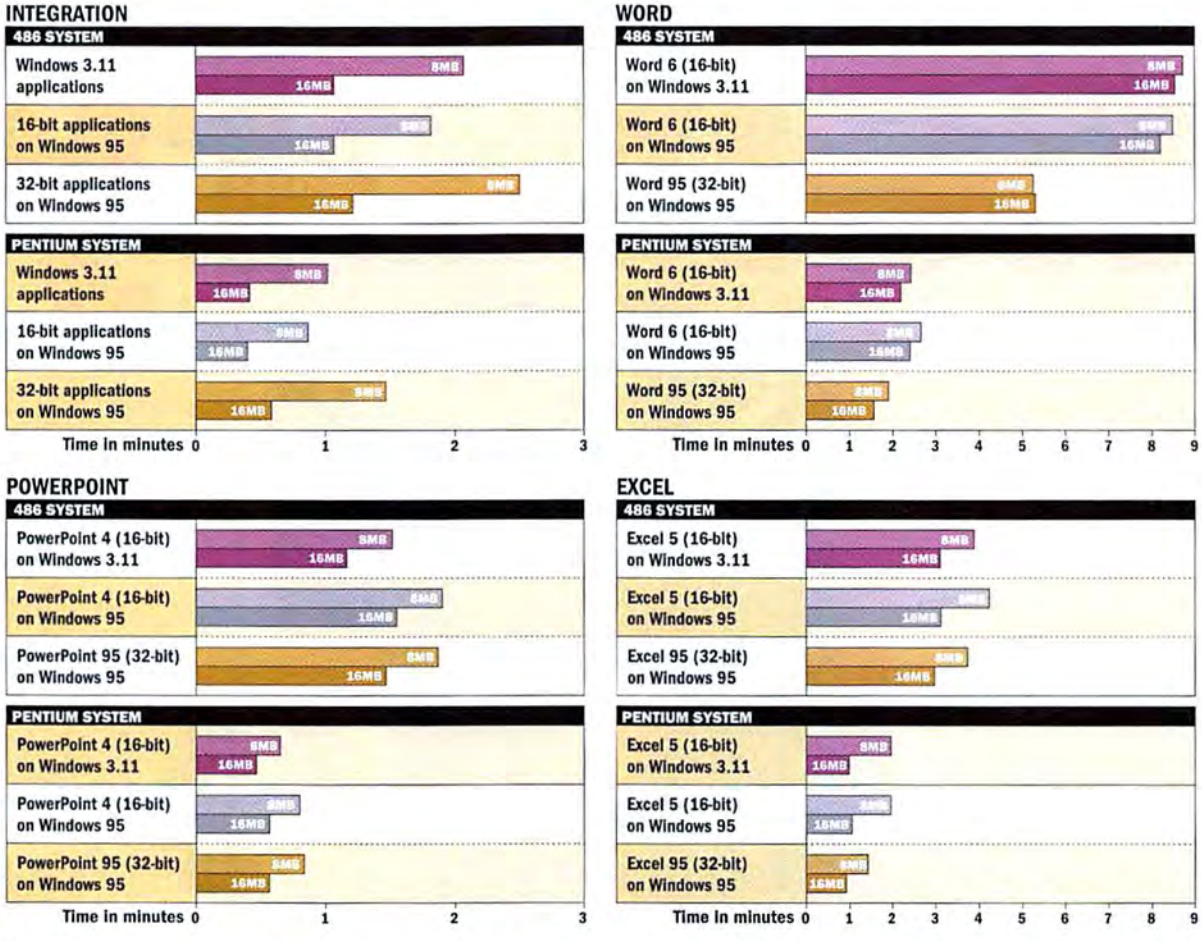
Office suite. Instead you must rely on a special command in Word to insert contact data from Schedule+.

Despite the inconsistencies and the missing ingredients, Schedule+ 95 is a useful and necessary addition to the Office lineup, especially for those individuals who have yet to adopt a PIM. The interface could be better integrated, and it could stand additional drag-and-drop routines for everyday tasks, but despite these shortcomings it will no doubt satisfy all the folks who have stayed with it for the last three years.

—Peter Scisco

Cathy Kenny is an associate editor for PC World. *George Campbell, Richard Jantz, and Richard Scoville are contributing editors for* PC World, *and Reid Goldsborough and Peter Scisco are frequent contributors. Testing conducted by Kevin Mitchell and the PC World Test Center.*

TEST REPORT Word 95 Outperforms Its Office Siblings



Methodology Tests were conducted with 8MB and 16MB of RAM on two platforms: a Micron Pentium-90 with an 820MB EIDE hard drive and a Diamond Stealth 64 graphics controller with 2MB of DRAM; and a Gateway 486 DX2-66v with 120MB and 200MB IDE hard drives and an ATI Graphics Ultra Pro Mach 32 graphics controller. We installed Windows for Workgroups 3.11 on each machine using the default configuration and created a 59MB permanent swap file using 16-bit access. We then installed Windows 95 over Windows for Workgroups using the default installation. Both systems were set to print to an Apple LaserWriter on FILE:. We installed Office 4.3 from a CD-ROM using the typical installation settings.

We conducted the integration, Word, and Excel tests with macros and conducted PowerPoint tests by hand. During the application integration and Excel tests, we loaded in the background cc:Mail Mobile, Schedule+, Excel, Paint, Word, and WinFax 3.0. During the Word tests, we loaded in the background the same applications except Word. WinFax 3.0 was set to auto-answer mode. All background applications were maximized and idle.

Integration We performed several tasks in both versions of Word and Excel. Operations included a SQL select of a dBASE table using ODBC for Excel 5 and ODBC32 for Excel 95. We also sorted information and created a pivot table. In both versions of Word, we inserted text and graphics, created a table, and inserted an Excel chart.

Word We opened 11 documents and performed a variety of editing, formatting, searching, and printing tasks; scrolled through a 175-page document and autoformatted and printed it; created a new document and imported eight bit-mapped color images; and created a new document and imported a 500-customer list in preparation for a mail merge.

Excel We performed ten recalculations of an adjustable-rate mortgage table with 360 periods; performed a variety of sorting, printing, and filtering tasks on a database of automobile information; and imported a large dBASE file.

PowerPoint We loaded a 45-slide presentation file; loaded a slide with a linked Excel chart; chose the View Slide Show option; and printed a 45-page presentation with no build effects.

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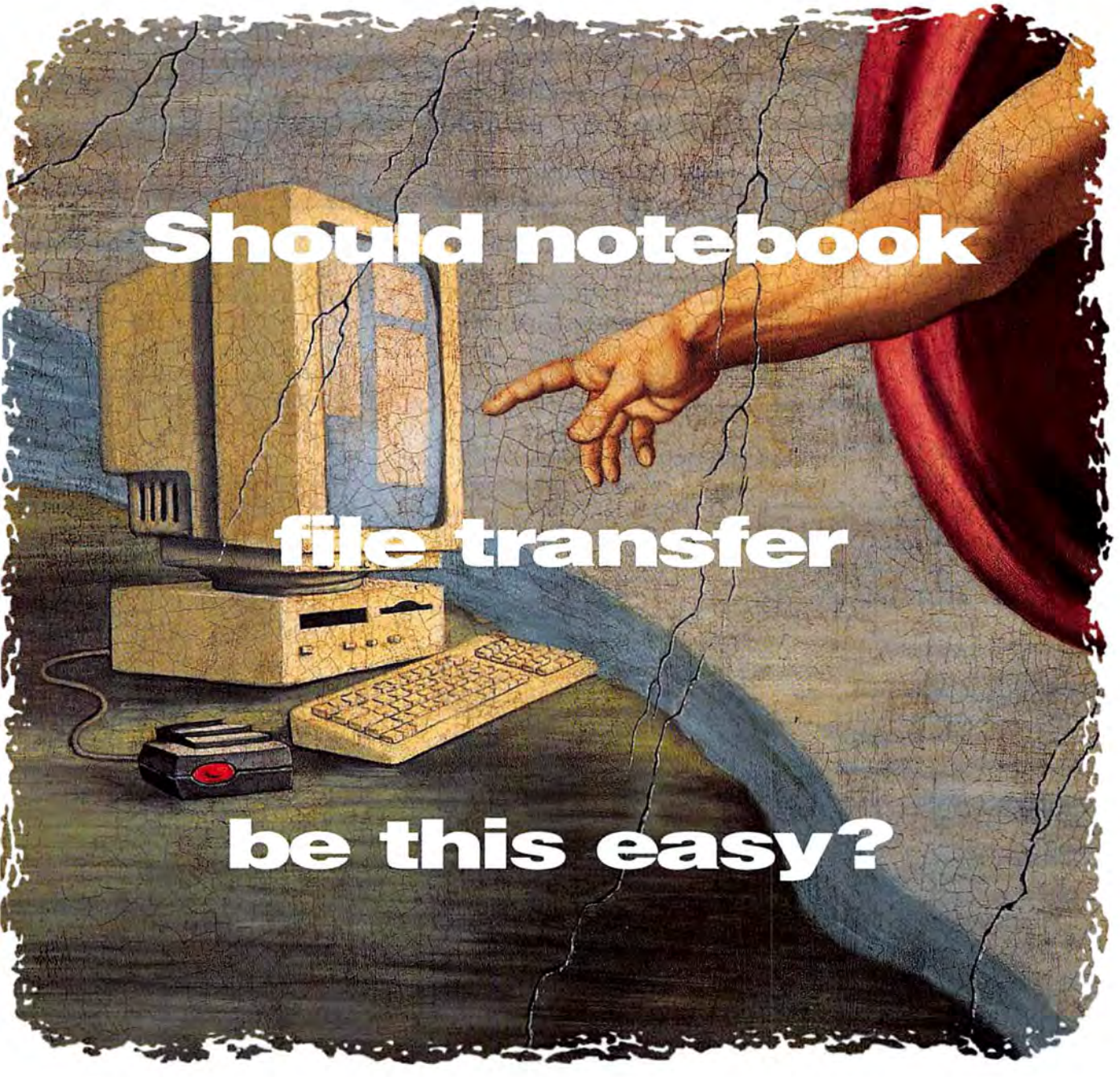

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Telecommuters offer surefire tips on taking work away from the workplace.

Commuting Meets

You don't have to go to the office anymore to get in a full day's work. Randi Swisley didn't even have to get out of bed.

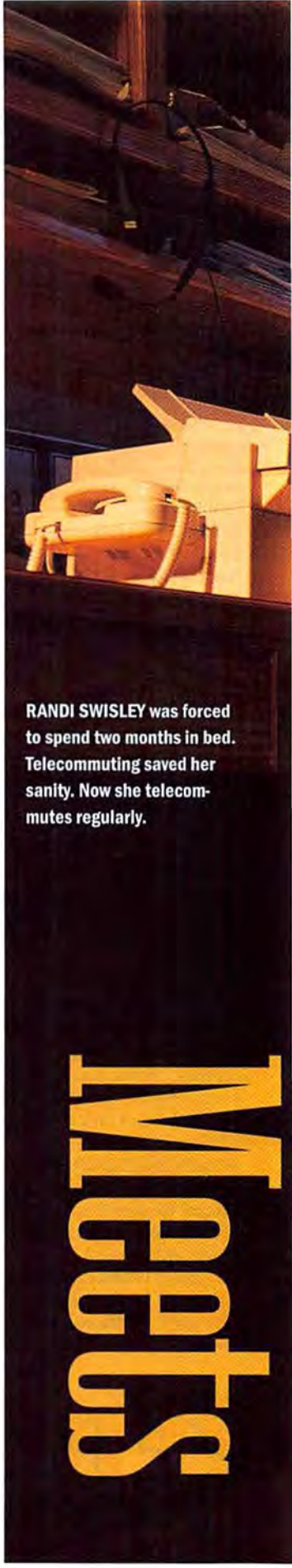
A research and development manager for Hewlett-Packard's Information Networks division, she was forced to spend two months in bed due to a problem pregnancy. With a desktop PC, fax machine, and telephone at her side, Swisley was able to continue working at nearly full steam. "Without my work," she says, "I would have gone batty." She now telecommutes from home several days a week.

Score another triumph for telecommuting, the New Age work style that liberates us from cramped, noisy office cubicles so we can work wherever we want and actually have a sense of accomplishment. As laptops, high-speed modems, and remote access software become the norm, more people are finding they can work just about anywhere—at home or on the road. In fact, many people find they do their best brainwork out of the office. And in many cases, their bosses are happy to see them go, as telecommuting is a proven way to keep employees happy, boost productivity, cut back on office real estate expenses, make use of travel time, and even reduce traffic and air pollution.

Despite its many advantages, telecommuting represents a big change in corporate culture and must be planned and managed. What kind of equipment will the off-site employee and the base office need? Who should pay for it? How can the telecommuter best keep in touch?

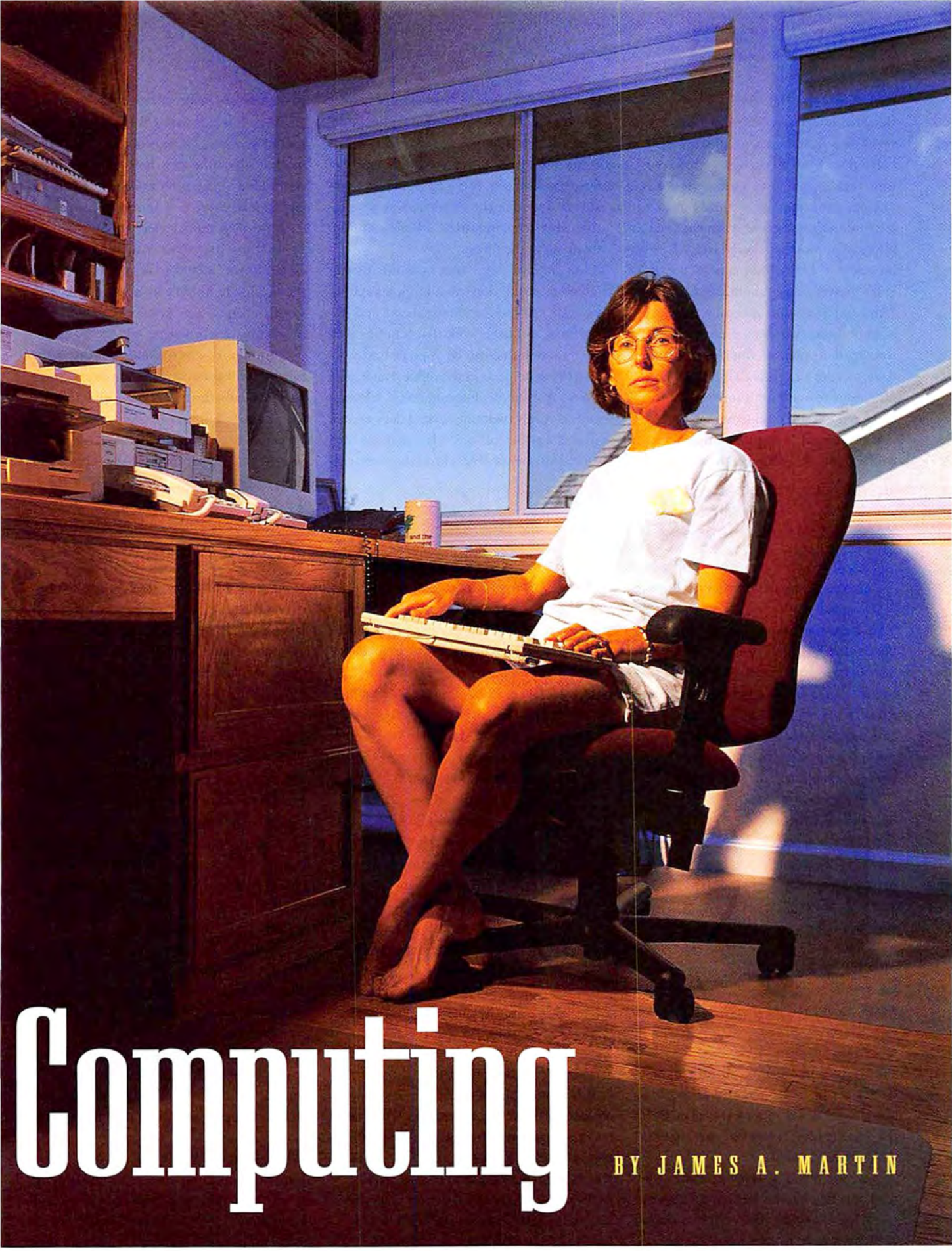
In short, you need a plan. To help you set up and manage—or just participate in—a telecommuting program at your company, *PC World* asked telecommuters, supervisors, tech support managers, and consultants for their sage advice. Whether you're a veteran or an aspiring telecommuter, a mobile worker, or someone who supervises off-site employees, these firsthand suggestions and strategies can help make your New Age, Out-of-Office Experience seem almost, well, transcendental. Just do the chanting on your own time, please.

The first step toward developing a telecommuting plan, according to Debra Schepp, coauthor *of The Telecommuter's Handbook* (McGraw-Hill, 1995, 800/722-4726), is to decide which business problems telecommuting can realistically solve. "You need to look closely at the business reasons for telecommuting," says Schepp. "Ask yourself if telecommuting is a good idea for the company. Do you want to expand but have no more room in the office? Are you faced with losing an employee whose spouse has been transferred to another state? Are you trying to reduce unnecessary office visits for employees who are most useful out in the field?"



RANDI SWISLEY was forced to spend two months in bed. Telecommuting saved her sanity. Now she telecommutes regularly.

JAY BLAKESBERG



Computing

BY JAMES A. MARTIN

Work vs. Oprah

Because telecommuting can be a culture shock, it's best to get acceptance and involvement from all parties—employees as well as management—before proceeding. "Upper management is usually okay with telecommuting, because it can cut costs and improve productivity," says Jack M. Nilles, president of JALA International, a Los Angeles–based management consulting firm. "And employees like it because they're sick of commuting two hours every day and they want more flexibility." But middle managers have to take the risks. They have to find new ways to communicate with their staff and keep track of productivity.

Managers often fret that employees who work off-site will become Opraholics, those glassy-eyed, chocolate bar–chomping denizens of the daytime-television netherworld. The solution is to look at the quality of the employee's work instead of the quantity of time spent off-site. But it helps to be reasonably certain that the employees will be responsible telecommuters—before you let them out of the office.

In general, the best candidates for telecommuting don't need much supervision; are self-motivated, organized, and disciplined; and have work that requires concentration or that can be done just as easily on a PC at home as in the office. But it's not always that simple. For instance, if telecommuters will be working several days a week away from the office's MIS people, they should be comfortable with technology, suggests Yee Jao, project leader for American Express Travel Related Services' telecommuting program. "If someone can't get their modem to connect, it helps if they have some idea of the problem so they can try and fix it themselves," Jao explains.

Above all, potential telecommuters should be enthusiastic about the idea, experts agree. Force people to telecommute, and they're likely to look for another job. Besides, charged-up employees will sell telecommuting to others.

"Our priority was to create a cadre of informed, enthusiastic telecommuters," says Ron Goethals, director of the Dallas County Community Supervision and Corrections Department, which has nearly 400 telecommuting probation officers. "We trained the most appropriate people, then sent them out to teach their peers and spread the message. Their enthusiasm was contagious."

Negotiate an Agreement

Have some kind of written agreement between the telecommuter and the company. It can be as informal as an e-mail message or as formal as a detailed document. "Without guidelines, a new manager can come into the equation who isn't supportive, and the whole arrangement may suddenly change," says Jerry Cashman, Hewlett-Packard's Work Options program manager.

A good telecommuting agreement provides structure without forfeiting flexibility. "We didn't prescribe what should go into each telecommuting agreement," says Curt Nichols, energy program manager for the city of Portland, Oregon. "We just told the employer and the employee to decide what will work, and then do it."

Items to be negotiated in a telecommuting agreement may include: who will purchase and maintain equipment; the hours the telecommuter will work; how the off-site employee will be contacted; the nature of the work the employee will do, as well as where the work will be accomplished (home, a telecommuting center, on the road); and arrangements for dependent care.

Use the Right Tool for the Job

For telecommuting employees to be more productive, they need the right tools and environment. In many cases, that means a telecommuter should have a computer that

WHEN *YOU* WANT TO TELECOMMUTE

Are you having visions of working at home, in peace and quiet, with your favorite baseball cap perched atop your head? If so, here are some strategies for getting the go-ahead.

- **Before you approach your boss, do your homework. The more you know about telecommuting's benefits, the better you can sell your idea. And the more you know about its downsides, the better you can address the boss's concerns.**
- **Put yourself in your boss's shoes. What concerns might your manager have? How can you make your manager's life easier by working off-site?**
- **Keep a log of what you do on the job for at least two weeks before you meet with the boss. Divide the tasks into columns: work that can be done at home, at the office, or both. If the tasks-at-home column comes up short, you'd better rethink your plan. But if the home column is lengthy, your argument will carry more weight.**
- **Figure out in advance as many of the technical details of telecommuting as you can. Does your office phone system allow you to forward calls to your home number, for instance? Don't waste the boss's time with "I don't know; I'll get back to you."**
- **If you have a reasonably current computer system at home, point that out to your supervisor in your initial meeting. If you're lacking some key elements, however—a fast modem, for example, or even a PC—then tread lightly. If you suspect your boss isn't going to embrace telecommuting warmly, you won't help your cause by waltzing into the office and unfurling a long list of equipment that you want the company to buy.**
- **After your initial meeting, summarize your proposal's key points by drafting a telecommuting agreement—even a brief e-mail message will do. And don't expect your supervisor to draft the agreement; you're trying to make the boss's life easier, remember?**
- **If none of this convinces your boss, find out precisely what the concerns are. If they're reasonable—a new project you're in line for will require you to be in the office every day, for instance—then set a date for a follow-up meeting on the subject. If the objections aren't valid—your boss doesn't want people out of sight—then it might be time to look for another job.**

JOHN HERSEY

is at least equal to the PC at the office.

"Hand-me-down computers at home don't cut it anymore," says David Goodtree, senior analyst for Forrester Research's Network Strategy service in Cambridge, Massachusetts. The speed of the remote computer is actually more important than the one you use at the office. Away from the office, you've got to drag files across telephone lines remotely. Older PCs just can't shuttle data fast enough for today's modems.

Along with a well-equipped desktop or notebook PC, to work off-site you'll most likely need a high-speed fax-modem (one that's capable of at least 14.4 kilobits per second; 28.8 kbps is preferred). Remote access software, such as Farallon's Timbuktu, can enable you to dial into the company LAN almost as easily as if you were working on-site (see "Dialing Direct" in this issue). You might consider a home ISDN line if you've got a lot of big files to transfer regularly (see "Top Telecommuting Tech Tips"). You'll also probably need a fax machine or a fax-modem and personal scanner to send paper documents. But don't go overboard with equipment in the beginning. You can always acquire more or better equipment later.

And don't assume a computer and peripherals are all the hardware you'll need. Swisley found, for instance, that she needed a refrigerator for her home office. By keeping her lunch in the upstairs office, she doesn't have to go downstairs during the day. "I have a teenager and small children," she explains. "They know not to disturb me in the study upstairs. But if I came downstairs for anything, they wouldn't let me go again."

Get a Room of Your Own

Telecommuters should have a separate room that can be used as a home office. "I recommend a room with a door so you can physically shut things out during the day," says Schepp. "And at night, you can close the door and put it all behind you."

What's more, you can deduct certain costs associated with a home office from your taxes, as long as that room is used strictly for work purposes. IRS publication 587, "Business Use of Your Home," can set you straight on the particulars. It's available by calling 800/829-1040.

"And don't forget about ergonomics," says Mary Jaeger, a telecommuter and executive director of the North Bay Council, a research and public policy institution in Novato, California. "You can have an ergonomic chair at the office. But it won't do much good if you sit in a funky old chair at home two days a week."

Ideally, you should install an additional phone line at your home office. One line just isn't efficient. You're likely to need to check your e-mail, send faxes, and make business calls, all in short order. Cellular phones make sense for many mobile professionals. With a cellular modem, you can send and receive e-mail messages and log on to the corporate LAN or the Internet, although these connections can be unreliable.

Pagers are an effective way for clients and coworkers to hunt you down, but they should be used sparingly, says Gert Berthold, a senior manager and mobile worker in Ernst & Young's management consulting practice in Chicago. "Be particular about who gets the pager number," he advises. "That way, when your pager goes off, you'll know it's something that needs your attention."

Draw Straws for the Check

Who's going to pay for that ergonomic desk and chair, the PC, the 28.8-kbps modem, and the extra phone line? It depends on the employee's situation and the company's commitment to telecommuting.

In general, most companies have guidelines, however flexible. 3Com, a Santa Clara,

WHEN *THEY* WANT TO TELECOMMUTE

What do you do when one of your employees wants to telecommute? Follow these steps to keep everyone—including your boss—happy and productive.

- **Ask why. Listen closely to the employee's reasons. If the focus is only on what benefits the employee—who thinks telecommuting will provide another hour of sleep, for example—take the request with a grain of salt.**
- **Find out what kind of work the employee plans to do at home or on the road. If you agree the work can be effectively done off-site, set deadlines so you can measure productivity.**
- **Don't let new employees telecommute. You need time to get to know them better so you can manage them appropriately.**
- **Telecommuting should be positioned as a reward for those who are dependable and self-motivated. Some companies post telecommuting positions internally and interview candidates.**
- **Though guidelines should be flexible, make sure this flexibility doesn't appear to favor some telecommuters over others. Don't agree to let one employee take home a new 133MHz Pentium, for instance, if you can't afford to do the same for other telecommuters.**
- **Telecommuting is not a substitute for day care. Be sure telecommuters make arrangements for child care.**
- **Don't let the employee work off-site more than one or two days a week in the beginning, if possible. That gives everyone the chance to get used to it slowly.**
- **Mondays and Fridays aren't the best days for telecommuting—it's too easy for the employee to stretch out the weekend.**
- **When several employees want to telecommute, try to keep them from being out on the same day—particularly if they have similar jobs.**
- **Try to get employees to be consistent about when they telecommute—every Tuesday and Thursday, for instance.**
- **Ask the employee to make a list of possible telecommuting expenses. How much will it cost to install an additional phone line? Will they need to use a courier service more frequently? Little expenses can add up.**
- **Establish a policy for handling crises. The telecommuter should agree to come into the office in an urgent situation within a set period of time. The manager should agree not to call the employee in unless it's a crisis.**

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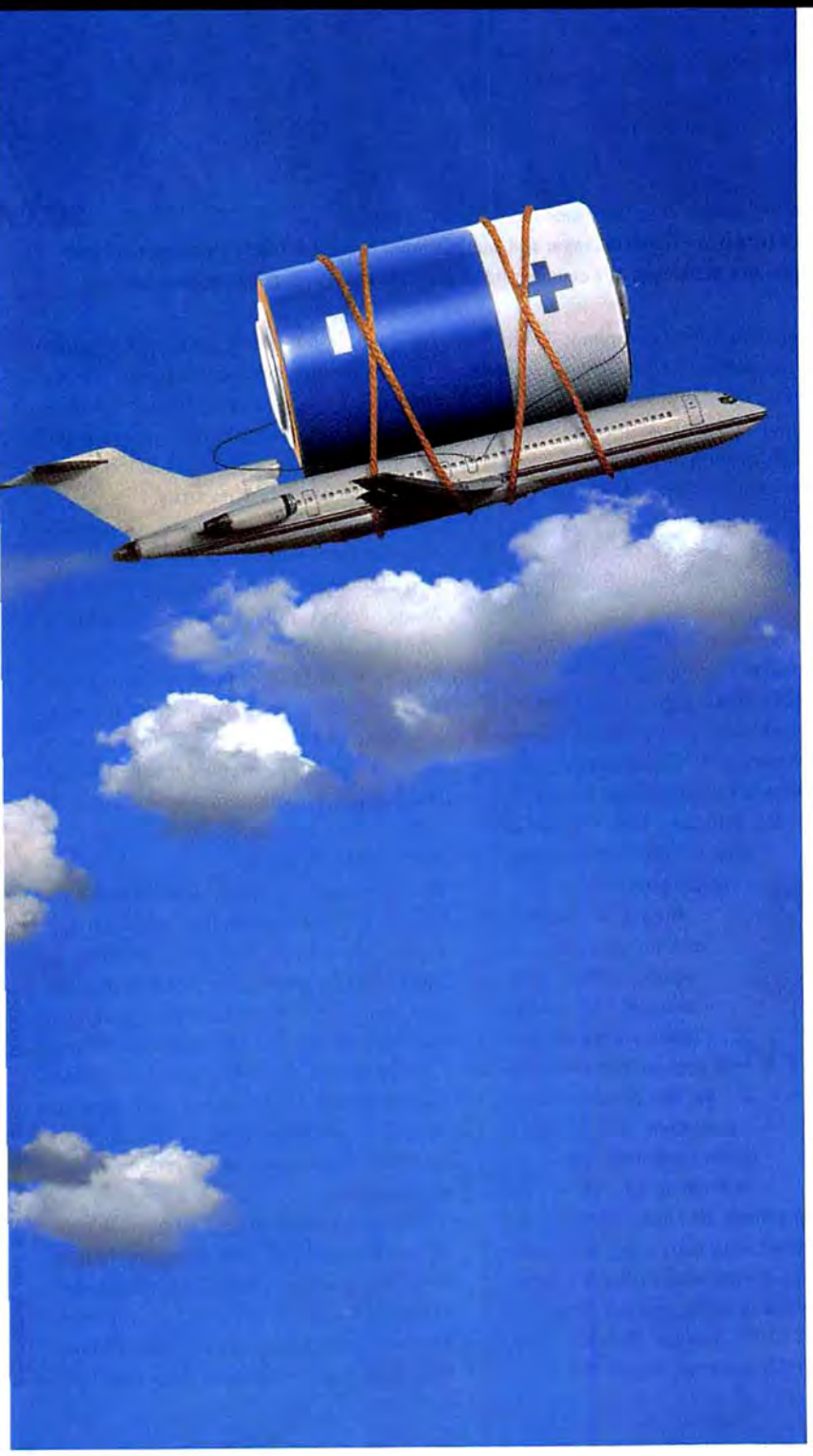

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California–based data networking company, will purchase, install, and repair the telecommuter's equipment, including a separate phone line; but it will not provide furniture. Hewlett-Packard equips workers "from soup to nuts," says Cashman. "We will pay for all related costs as long as it's understood that the equipment will be brought back at some point," Cashman adds. In contrast, Nichols says the city of Portland, Oregon, doesn't provide any equipment or furnishings but will pay for phone expenses.

A number of companies are opting to buy notebook computers and docking stations instead of desktop PCs. "I'd rather buy an employee a notebook with a docking station at home and at the office," says Ken Radziwanowski, an AT&T telecommuting instructor for the company's business school in Somerset, New Jersey. "The company isn't making redundant expenses in that case, and the employee can work anywhere."

The bottom line for companies and employees: Be flexible. "There are no absolutes here," says Joanne H. Pratt, a Dallas-based telecommuting consultant. "Why be frozen into absolutes when the whole point of telecommuting is flexibility?"

How much does it cost to equip an off-site worker? According to Forrester Research's Goodtree, expect to pay $4462 on average for each home-based employee's setup. That figure includes the purchase of a high-end PC, tech support, connectivity fees (such as phone charges), and corporate setup costs. Annual costs are around $2158, about half of which is for connectivity.

While it sounds expensive, companies actually save money via telecommuting. Through increased productivity, lower real estate costs, and decreased employee turnover, a company can save anywhere from $6000 to $12,000 a year for each person who works one or two days a week at home, according to JALA's Nilles. Those savings take into account expenses setting up and maintaining telecommuting workstations.

GERT BERTHOLD is a senior manager and mobile worker in Ernst & Young's management consulting practice in Chicago. His company has a sophisticated telecommuting program.

Support From Big Brother

It's not enough to ensure that off-site employees have all the tools they need; the corporate office must have the resources to keep workers productive. Depending on how many telecommuters your company has, you may need to hire additional technical support staff, Goodtree says. In addition, you will probably need to train tech support, as well as telecommuters, in new applications like video conferencing, remote access, or groupware.

If you can't afford to beef up the tech support staff, consider hiring an outside firm to help. For example, Stream International (formerly Corporate Software) of Norwood, Massachusetts, offers corporations 24-hour help-desk support for more than 1200 soft-

TOP TELECOMMUTING TECH TIPS

These suggestions, from interviews with tech support and mobile workers, should help you avoid some of telecommuting's "gotchas."

- **Set up a telecommuting workstation in the corporate office for a trial run. Have employees work out the kinks while still on-site.**
- **ISDN lines aren't for everyone. If you often transfer large files or use video conferencing you'll need one. Otherwise, analog will suffice.**
- **If you go for ISDN, anticipate needing more tech support. Designate at least one tech support person to be the ISDN expert or get support from a third-party provider, such as Nortel's Meridian Home-Link service. *Nortel (Northern Telecom), 800/466-7835,* reader service no. 775.**
- **Video conferencing can be expensive and difficult to use. But some desktop publishing/quick copy stores, such as Kinko's, now provide videoconferencing facilities. *Kinko's Copy Centers, 800/254-6567,* reader service no. 776.**
- **Mobile workers with a laptop and fax-modem should consider a personal scanner like Visioneer's $399 PaperPort. It comes with software to convert printed documents into editable text. *Visioneer, 800/ 787-7007, 415/812-6400,* reader service no. 777.**
- **Cellular modems can be unreliable. To transfer cellular transmissions to analog lines, look into services such as MCI's Xstream-Air. *MCI Telecommunications Corp., 800/872-7654,* reader service no. 778.**
- **Backing up data on the road is a challenge. One easy solution: Have your mobile workers carry along a Zip drive from Iomega. It's portable, fast, and inexpensive—the drive is $199, and a 100MB cartridge is $19.99. *Iomega, 800/697-8833, 801/778-3712,* reader service no. 779.**

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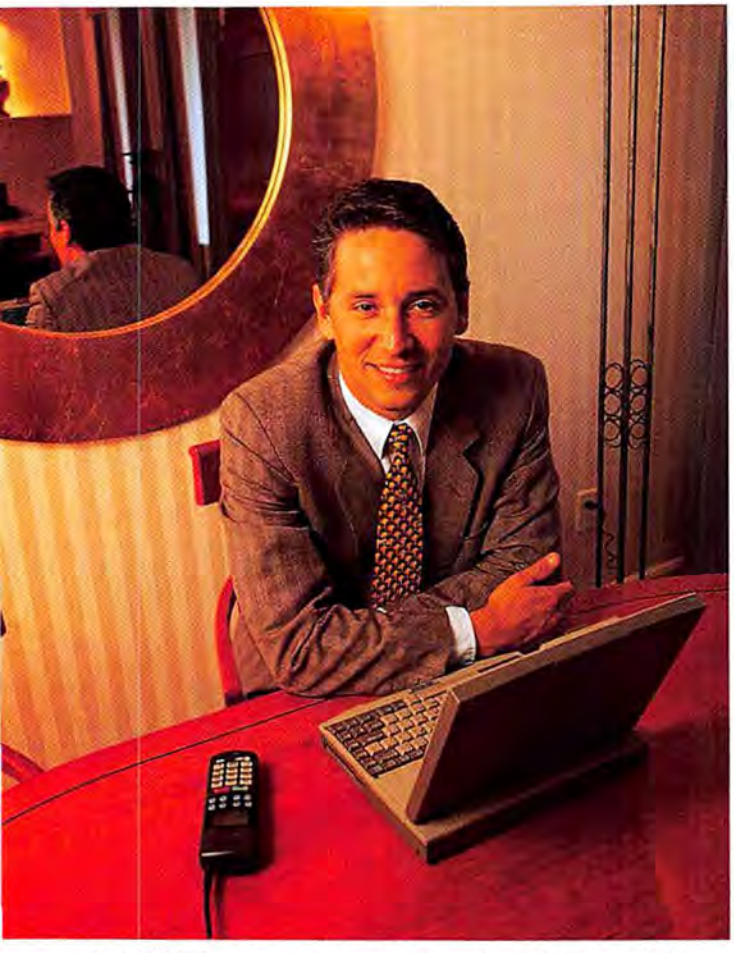
Compatible with Windows 95 and all previous versions of Windows.

Start

ware and hardware products. (*Stream International, 617/440-1000* **Reader service no. 780**).

Another option is to purchase mobile products that are all supported by a source like AT&T Global Information Solutions' Virtual Workplace. Any product with the Virtual Workplace logo is supported through one technical support number; mobile computer users thus have one outside party to turn to when things go wrong (*AT&T Global Information Solutions, 800/979-4242* **Reader service no. 781**).



MAX DOBENS, a national account manager for Swissôtel, thinks it takes a few months to get your bearings as a telecommuter.

Avoid the OOSOOM Syndrome

One of the biggest anxieties telecommuters experience is the "Out-of-Sight, Out-of-Mind" syndrome. Essentially, it's the fear that you'll miss out on insider news or be passed over for choice assignments—even a promotion—because you were in absentia.

There are ways to cut the risk. "When you're not in the office physically, you need to be there in other ways," says Drew Banks, manager of technical education and distributed learning for Silicon Graphics' Learning and Development Department. "I send out an e-mail every day, something informal like a funny anecdote from the morning newspaper. And later I send another to let people know what I'm working on and how it's going. But e-mail shouldn't be a substitute for conversation."

"You must take the initiative," says American Express's Jao. "You've got to call your supervisor a few times a week, and ask for feedback on your work."

Popular wisdom is that you should arrange a reason for coming into the office and attend as many meetings and office social events as possible.

A related concern is that your absence will cause problems for your supervisor, coworkers, and clients. Anticipate the details that might slow things down because you're not in the office to handle them. The more you stick to a schedule—every Tuesday and Thursday, say—the less disruption you'll cause. If that's not possible, keep coworkers and superiors briefed on your whereabouts. For example, post a schedule outside your office, along with a number where you can be reached.

Finally, schedule a status meeting with your supervisor once a week, either over the phone or in person. Bosses don't want to appear as if they're spying on you, but they need to be kept up to date on your activities. And you need to make sure your boss is aware that telecommuting is allowing you to plow through work like nobody's business.

Start Small But Think Big

Call it a pilot program, a prototype, or just covering your behind, but a company's initial steps into telecommuting should be positioned as just that: a trial. Start slowly, with a few select people; find out what works and what doesn't; then use that information to develop guidelines.

How long you experiment depends on how complicated your setup is and how good you are at working on your own. On average, "It takes at least six to nine months to really figure out what works and what doesn't," says Max Dobens, a national account manager for the hotel chain Swissôtel.

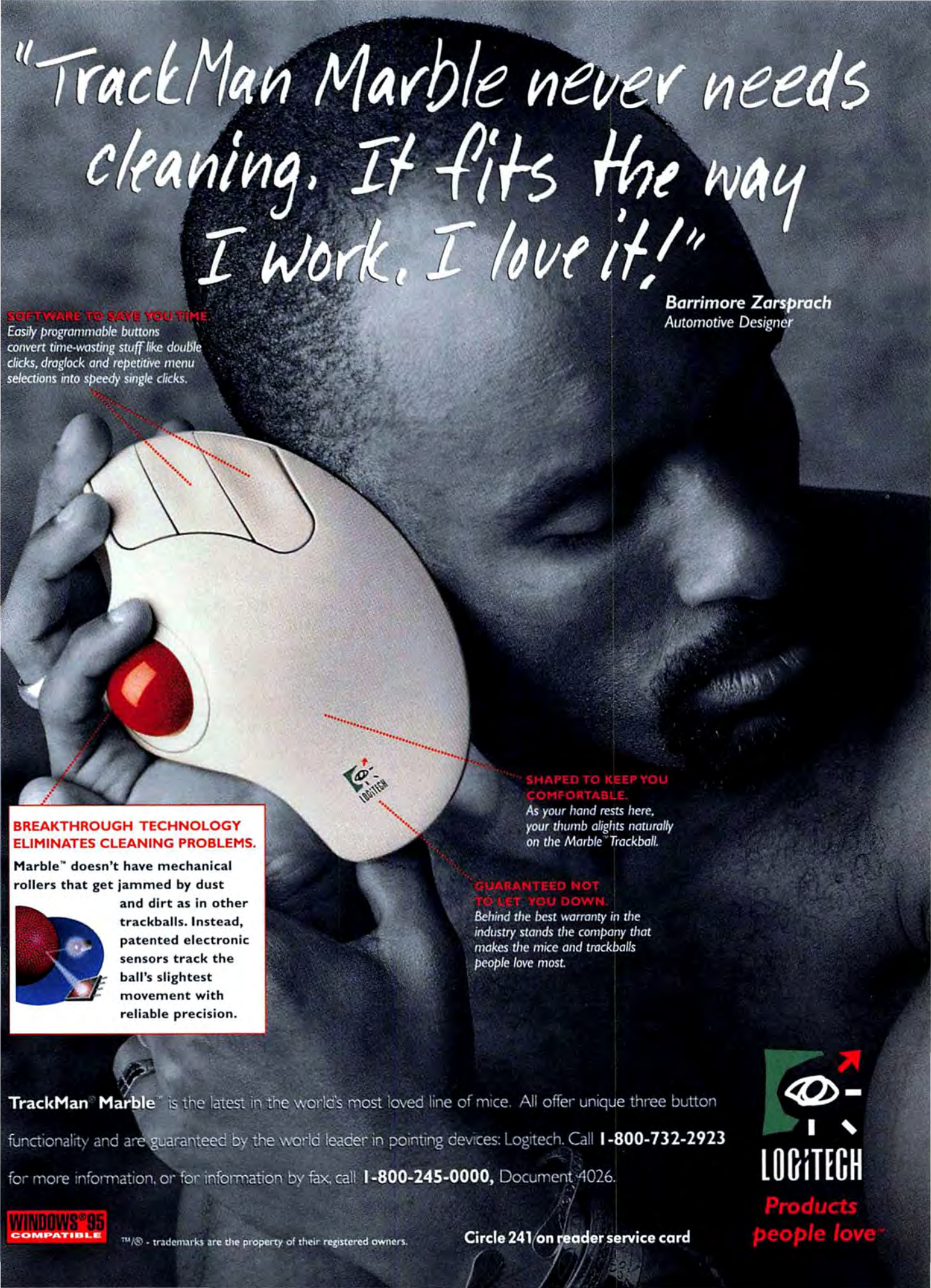
Once your company has gained some telecommuting experience it's time to use what you've learned and create some guidelines to follow in the future. Some companies develop written, point-by-point telecommuting guidebooks for distribution to all employees. Before you write one, try to look at how other companies have handled it. SmartValley, a nonprofit consortium devoted to telecommuting and other advances in working, has developed a guidebook. It's available for downloading at SmartValley's World Wide Web site (**http://smartone.svi.org:80/PROJECTS/TCOMMUTE/TCGUIDE**).

The Sanctuary Called Home

It used to be that the office was the only workplace. But—in case you haven't noticed—that scenario has changed. Longer work hours, increasing pressures from home and travel, and the need for flexibility have made it impossible to work only from the sanctuary of the office. Meanwhile, that sanctuary is in constant decline. In an effort to save money, companies have put us in small cubicles, where we're vulnerable to ringing phones, interruptions from coworkers, and other vexatious distractions. We dash to meetings all day, then hope things will quiet down around 5 p.m. so we can get some work done. With that state of affairs, telecommuting has become a necessity for doing business—and keeping our sanity—in the nineties and beyond.

James A. Martin is a contributing editor for PC World.

For more information on all products and services in this article, circle reader service no. 909.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to write as fast as you can think

Introducing new Microsoft Word for Windows 95.

The connection between the ideas in your head and the words on your screen becomes immediate, almost seamless. Thoughts, sentences, paragraphs flow continuously, uninterrupted by software. You don't stop writing to format your documents. AutoFormat knows when you are trying to create a numbered list and automatically indents and inserts the next number. You don't stop to correct words when you capitalize the wrong letter, or when you inadvertently hit Caps Lock. AutoCorrect fixes them as soon as you hit the spacebar. These are examples of Microsoft® IntelliSense™ technology. Technology that recognizes what you are doing and helps you do it faster. Technology that makes it easier for you to focus on your work, because you spend less time making the software work.

The software learns your typing habits. It lets you concentrate on the words, not on how to spell them.

Spell-checking now happens on the fly, as you type. Misspelled words are underlined so you can correct them as you go. Click on the right mouse button and alternative spellings appear. Common mistakes everyone makes when typing are corrected by the software automatically. (*Thier* is changed to *Their* every time you type it.) And it learns to recognize both the idiosyncratic mistakes you have a tendency to make, and the peculiar names, abbreviations, and spellings you don't want it to correct. If you override a correction, it adds the word or phrase to its exceptions list and never makes that change again. It has even learned to speak your language. If you have a question, you ask the Answer Wizard in plain English. "How do I make this into two columns?" It gives you step-by-step instructions. You stop working only long enough to type in your question.

Microsoft

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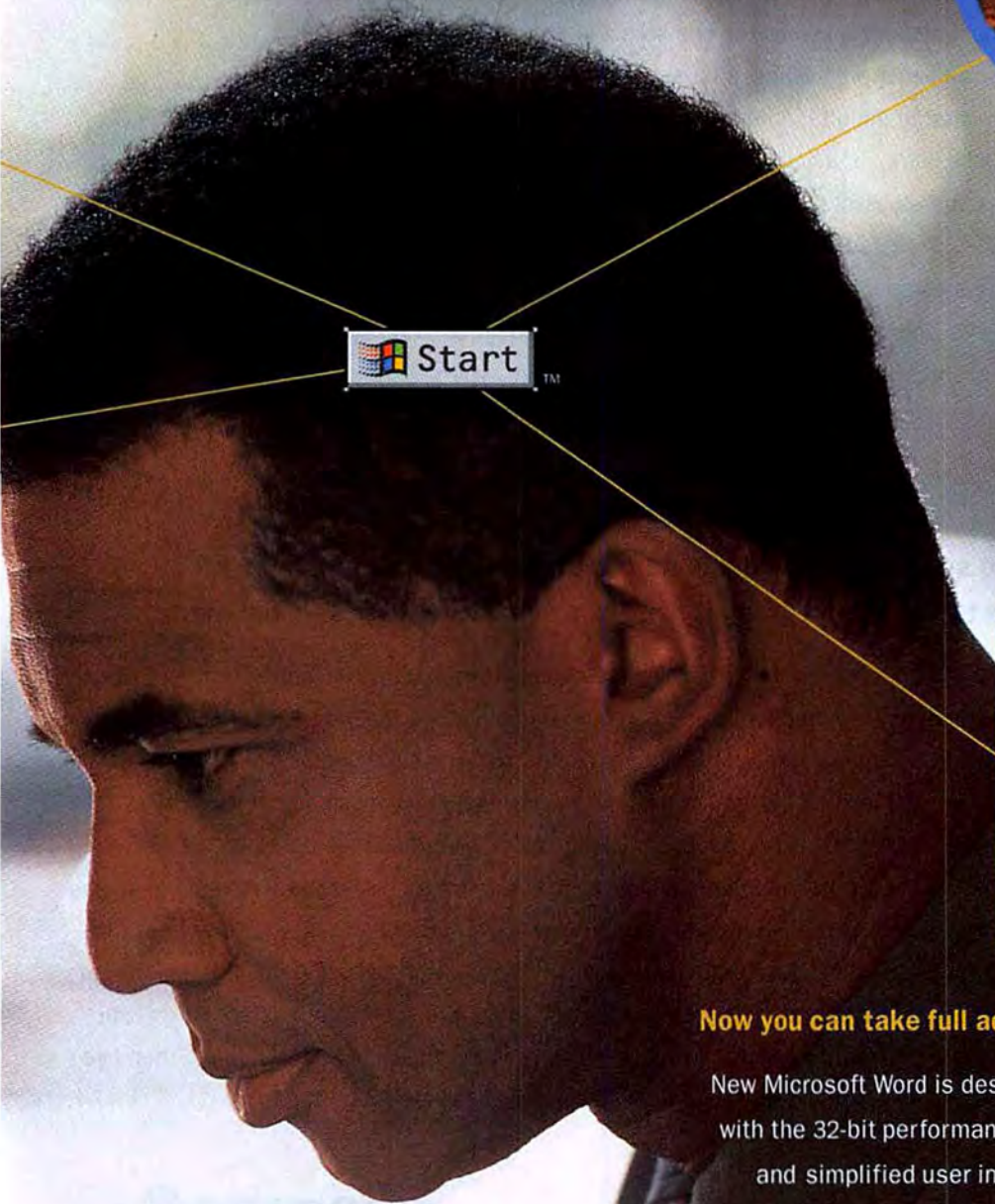
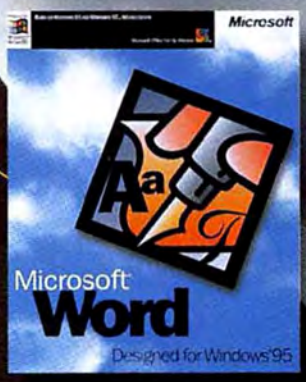
Share your words on paper, in e-mail, over the Internet, or wherever your ideas need to be seen.

With WordMail's connection to the Microsoft Exchange Inbox in Windows® 95, you can write e-mail messages using the many formatting options of Microsoft Word to communicate more clearly, more convincingly. Use the Highlighter to emphasize key information. Make your case in ways you never could with traditional e-mail editors. You can share documents with clients and coworkers, make suggestions, and indicate changes using Word's many revision tools. And you can use the Internet Assistant* for Word to browse the World Wide Web and author your own documents there.





Now you can take full advantage of Windows 95.

New Microsoft Word is designed to work hand-in-hand with the 32-bit performance, advanced multitasking, and simplified user interface of the Windows 95 operating system. It integrates seamlessly with the other programs in new Microsoft Office. The combination of new programs and a new operating system makes computing fundamentally faster and easier. Easier for you to focus on your work, not on your software.

to hear the applause before you even speak

Introducing new Microsoft PowerPoint for Windows 95.

Now you can walk into any business meeting, both formal and informal, knowing you will make your point in a compelling way. New Microsoft® PowerPoint® helps you speak with confidence, whether it's in a one-to-one status meeting with paper handouts, a speech with 35mm slides, or a remote on-screen presentation shared simultaneously with clients and coworkers a thousand miles away. You build your case screen-by-screen, you know all the points you want to make will appear, you use all the power and flexibility of PowerPoint to add drama and impact to your message. Sentences appear on-screen by paragraph, word, or character to add emphasis where needed. Images can build in sequence. Specific points can be accompanied by sound, images, and video. With PowerPoint, you not only appear professional and prepared, you make your point in a more persuasive, a more compelling way.

Step-by-step, the software helps you build the presentation. It shows you how to use the program. It helps you communicate more persuasively.

PowerPoint does the hard work of pulling the presentation together for you. Select from topics such as selling a product or writing a business plan, and the program will suggest an outline, design, and format for your presentation. The AutoContent Wizard will tailor your message according to how much time you have and the type of output you wish to generate (35mm slides, paper handouts, on-screen presentations). StyleChecker will help you avoid presentation mishaps by checking for readability and common mistakes in spelling or punctuation. And to add visual impact, AutoClipArt will scan for key words and suggest appropriate clips or images. If you have questions at any time, ask the Answer Wizard for help. You type in a question, and it will walk you through the task step-by-step. When your presentation is built, you can preview and edit how it will look in black-and-white print outs, and then use the Pack and Go Wizard to automatically package it on disks so you can take it on the road.

Microsoft

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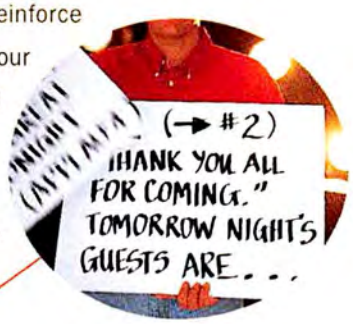
In both face-to-face meetings and remote presentations, PowerPoint puts you in command of the situation.

Even if your audience is on the other side of the world, you can still be in control. Presentation Conferencing lets you deliver and review your message with remote workgroups over a network. During the discussion stage, you can use the Slide Navigator to select specific slides from the presentation to reinforce the points you want to make, to answer spontaneous questions. And to make sure your meetings lead to constructive action, the Meeting Minder lets you take notes, record the minutes of a meeting, and assign action items on the spot. From start to finish, from building your case to making your point, new Microsoft PowerPoint helps you prepare, helps you speak with confidence, helps you make the most of any meeting.



Now you can take full advantage of Windows 95.

New Microsoft PowerPoint is designed to work hand-in-hand with new Windows 95 technology like multitasking and multi-threading. (Now you can keep working while your presentation is printing.) It was designed to integrate seamlessly with the other programs in Microsoft Office. Together, the new programs and the simplified user interface of Windows 95 make computing fundamentally easier. They make it easier for you to focus on your work, not on your software.

If a picture is worth a thousand words consider this a dissertation.

Instantly capture images of homes, before they go on the market, then display them on a TV for a client or friend.

Shoot a picture of property damage, products, inventories — anything you need to keep on file for your business. Stay current by deleting unwanted images from the QV-10 instantly without uploading to a PC.

Capture pictures at family events and view them immediately on a TV. Then save the images on a videotape or computer disk, and produce color prints from almost any computer or video printer (like the Casio VG-100).

Create charts and graphs on a computer and use them in your business presentations. The QV-10 accepts almost any computer image you create.

The QV-10 gives you enough memory for 96 digital images. With built-in LCD color screen. Plus video and computer outputs. More uses — for business and pleasure — than you can count.

Computer Connection. The QV-10 comes with Macintosh® and Windows® links so you can upload images to edit, print or share with other computers on your office network. You can even send images to colleagues on the Internet.

Video Output. Connect to a VCR and you can create an instant video album — or a full business slide show — at the touch of the button. You can even view multiple images on one screen.

Applications. The QV-10 is the perfect tool for real estate, insurance, business presentations, family events — anywhere you need pictures *and* flexibility.

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You're working at home or in a hotel room. Your programs and files are on your office PC. Finally, remote access software lets you get those files, wherever you are.

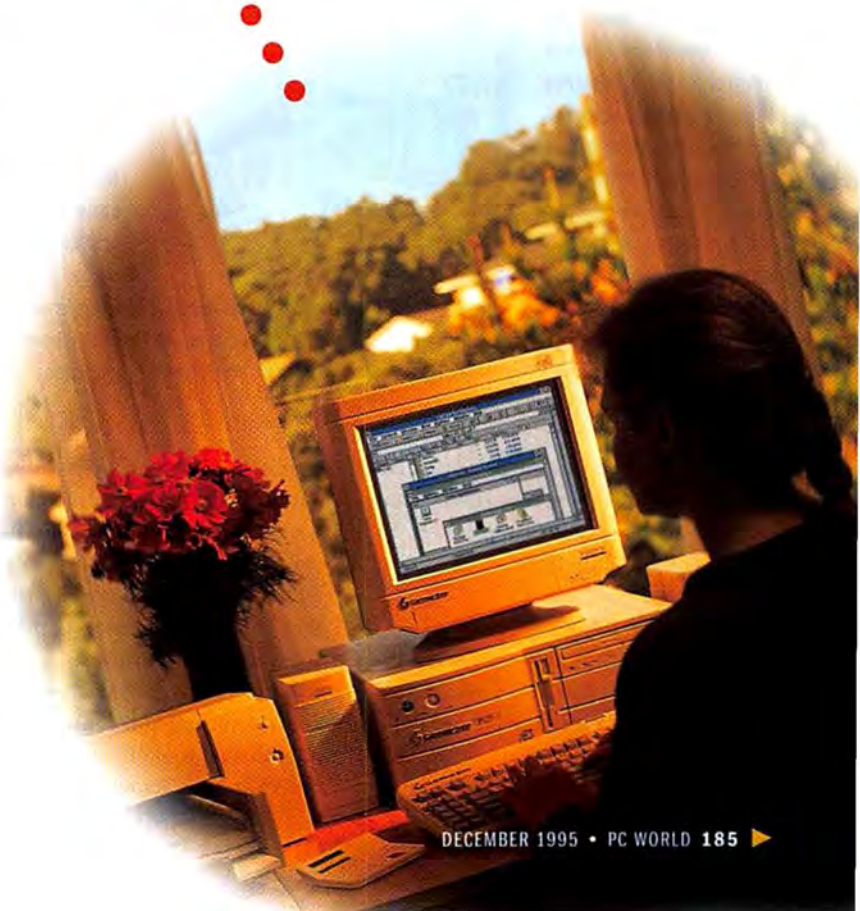
Dialing Direct

BY PETE LOSHIN

When it comes to your office PC, absence may not make your heart grow fonder—but it sure can make you less productive. That's a big problem in an age in which you probably more than ever find yourself working when you're not actually *at* work—whether it's because you're out talking to customers or an unexpected day-care snag keeps you at home with your child for a day.

There are a multitude of ways to get access to your office's vital software and files from distant locations, ranging from simple floppy disk transfers to hardware devices that cost thousands of dollars. If you're using Windows 95, you can also take advantage of remote access features built right into the operating system itself. But whether you're using Windows 95 or not, buying a separate remote control software package will give you the widest range of ways to access your office PC from home or on the road.

ERIN BUTLER



If you've tried remote control before with earlier software and 2400-bps or 9600-bps modems and found it slow and difficult to use, now's a good time to take another look. With the best of the current remote control packages and today's 28.8-kbps modems, the days of tricky installation and glacial speed are only painful memories.

In this review, we evaluate six Windows packages priced from $99 to $169 that provide remote control and other telecommuting options: Avalan Technology's Remotely Possible/Dial 4.0, Microcom's Carbon Copy 3.0 for Windows, Norton-Lambert's Close-Up 6.0, Stac Electronics' ReachOut 5.0, Symantec's Norton pcAnywhere 2.0 for Windows, and Traveling Software's LapLink 6.0 for Windows.

These programs are aimed at serving the needs of a single user, not a whole workgroup. For information on software and hardware designed to let an organization provide remote LAN access to a large number of users, see "Stay Connected to Your Net," *PC World*, July 1995.

Get Your Files From Afar

With remote control software installed and running on both your office system and a home PC or notebook, the off-site PC becomes a long-distance clone of the office one, letting you run the office PC's software and access its drives over a modem connection. Most of the packages we evaluated also let you establish a remote control session over a LAN, and some support connections over an ISDN line and the Internet.

Since the programs you operate remotely actually reside on your office PC, you don't need to install your favorite applications separately on your off-site PC, which can save time, money, and disk space. Also, a remote control session only needs to transfer your office PC's display information—not all the data files you're editing remotely—across the modem connection. This means it's the only remote access solution that lets you work with large files, such as databases, without interminable waits as multiple megabytes of data are sent by modem.

All of these packages include file transfer utilities for moving data between systems, so you can copy files back and forth between PCs and then work with them without being connected by modem, as long as the applications they use are installed on your off-site system. (Most of the products offer synchronization options, which ensure that the file versions on both PCs reflect your most recent changes.)

Carbon Copy, pcAnywhere, and ReachOut also include drive mapping, which lets programs on your off-site PC access the office PC's disks across the modem connection, as if they were local (albeit very slow) drives. This means you can work with office files from within your off-site PC's programs without using a file transfer utility.

Each of these features has its place; see "The Right Remote Access Option for the Job" for tips on how to choose among them. If both your PCs are running Windows 95 and Microsoft's Plus add-on pack, you can use the new operating system's Dial-Up Networking feature to map drives and transfer files (see "Remote Access the Windows 95 Way"). Windows 95 doesn't offer remote control, though, so you'll still get the most telecommuting options by buying one of the products reviewed here.

A Matter of Expectations

Even in the best of circumstances, remote control isn't just like being there. Pumping Windows' screen data over a phone line is an inherently slow process: Even with fast PCs equipped with lots of RAM and 28.8-kbps modems, the performance may remind you of a 386 PC with 4MB of RAM.

In our tests, the speediest remote control product, LapLink, was about 34 percent quicker overall than the slowest, Remotely Possible/Dial. (We rated speed by timing a variety of tasks in representative Windows-based software packages; see "LapLink Leads the Pack in Remote Control Performance" for test results.) We found that only the three fastest programs—LapLink, Close-Up, and ReachOut—were quick enough to let us work in relative real time.

Make sure, too, that your choice can work with the operating systems you use. All the products we tested are 16-bit Windows 3.*x* programs, but ReachOut, Carbon Copy, pcAnywhere, and LapLink run under Win 95 and allow interoperation between Windows 95 and Windows 3.*x* PCs. Only Close-Up's off-site software works with Windows 95; the office PC must run Windows 3.*x* or DOS. Remotely Possible/Dial is for Windows 3.*x* or DOS only. At press time, 32-bit Win 95–compatible versions of LapLink, pcAnywhere, and Remotely Possible were all planned for release by the end of 1995.

Remote Realities

There are other remote control hazards that have nothing to do with the particular product you choose. You can dial into a PC only

BEST BUYS

Traveling Software's LapLink 6.0 for Windows was the fastest remote control package in our tests—but that's only one of the many reasons it's a Best Buy. This package puts the most important remote control features together in an unusually accessible way, and it includes a rich set of file transfer options that you can use either across a modem connection or through the bundled serial and parallel cables or optional wireless transmitters.

The only major features that LapLink does not offer are drive mapping and the ability to output to a local printer during a remote control session. If you need these capabilities, try our other Best Buy: Stac's ReachOut 5.0. Despite some quirks that required technical support calls during our tests, ReachOut delivered solid performance and included all the remote access features we could want, including comprehensive security options. At the low street price of $99, it's a particularly good value.

THE RIGHT REMOTE ACCESS OPTION FOR THE JOB

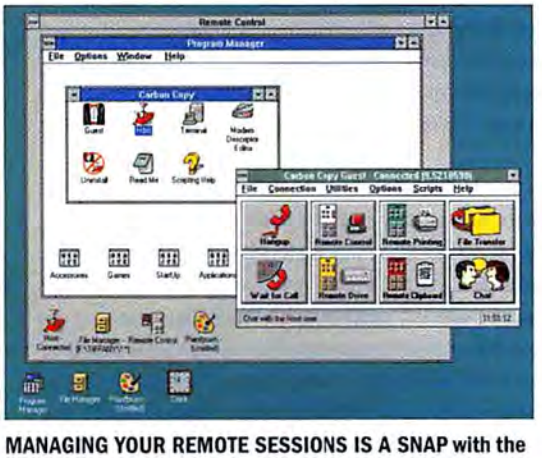
Today's remote control packages—as well as Windows 95's Dial-Up Networking—provide multiple ways for you to tap into your office PC from home or a hotel room. Here's how to choose among them.

	REMOTE CONTROL	DRIVE MAPPING/WINDOWS 95 DIAL-UP NETWORKING	FILE TRANSFER/WINDOWS 95 DIAL-UP NETWORKING
What it does	Lets you use an off-site PC as a long-distance clone of your office PC.	Lets your off-site PC access distant hard disks over a modem connection.	Lets you copy files and directories between the off-site and office PCs.
When it's useful	For most applications, but especially when you're working with databases and other large data files.	When you want to work with office files from within the applications installed on your off-site PC, without doing a file transfer.	When you want to work with office files without being connected by modem, such as during a plane trip.
Applications to avoid	Illustration software, image editors, and other graphics-intensive programs.	Databases and other programs that use large data files, such as PIMs.	Databases and other programs that use large data files, such as PIMs.
Keep in mind	Phone bills can mount up, but this is the one option that lets you use applications without installing them on your off-site PC.	Don't try to run your office PC's software from a mapped drive; remote control will provide much better speed.	Take advantage of synchronization features to keep multiple versions of files sorted out.

if it's running and connected to an auto-answer modem and a phone line—which means that your office system will answer every call on that line when it's running the remote control software. And if you can install your remote access software on a pair of PCs sitting next to each other, do it. Solving communications problems between PCs in different places can give you headaches.

Such hassles are real, but they're also worth putting up with, considering the freedom that remote access provides. When going into the office isn't convenient—or even possible—these products can go a long way toward bringing the office to you.

Pete Loshin, a Boston-based network consultant, is the author of Electronic Commerce *(Charles River Media, 1995, 800/382-8505).*



MANAGING YOUR REMOTE SESSIONS IS A SNAP with the oversized icons in Carbon Copy's control panel.

Carbon Copy 3.0 for Windows

PROS: Complete set of remote access features, easiest to install, complete connectivity and security

CONS: Remote control is slow

Like a loaded luxury automobile, Microcom's Carbon Copy puts every possible option at your fingertips but doesn't excel at performance. With a bounty of remote access bells and whistles and the easiest installation we've seen, this package offers a lot for its $99 street price. The only problem is its disappointing remote control speed compared with the quickest packages here.

Carbon Copy's thoughtful design starts with a setup program that does most of the work of configuring your PC and modem. Similar thoroughness pervades the package, from the many ways you can connect—serial or parallel port modem, direct cable, LAN, or ISDN—to the wealth of security options, including the ability to limit access by drive or directory and to restrict read and write access.

Remote control with Carbon Copy works reliably and logically. When connecting to an office computer that has a higher-resolution screen than your off-site system, you can choose to view the office desktop in a scrollable window, squash it to fit the off-site PC's smaller screen, or display it full-screen without scroll bars and pan across the wider display.

Carbon Copy's one serious limitation is its remote control performance: It finished next to last in our speed tests. Its snappy drive mapping feature may be a better solution if you're using applications that aren't disk-intensive, such as a word processor or spreadsheet. And if you want to wring the best performance out of Carbon Copy, try using it with Microcom's parallel port modems, which can operate faster than conventional serial modems. *Microcom, Inc.*, 800/822-8224, 617/551-1000 **Reader service no. 689**

Close-Up 6.0

PROS: Fast remote control, makes no changes to configuration files

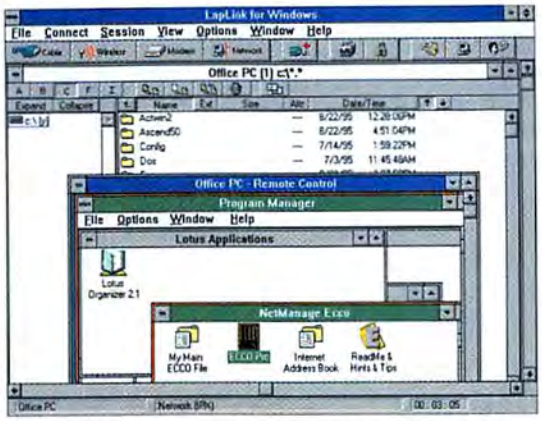
CONS: Requires a TSR for office operation, limited to 800 by 600 resolution and 16 colors, no drive mapping

If speed were everything, Norton-Lambert's Close-Up would be a winner. It finished a fairly close second in our remote control benchmarks, and completed the WordPerfect section more quickly than any other product. But unfortunately, this $125 package has a sparse feature set, an outmoded architecture, and an aging interface.

Only the software you run on your office PC provides a true Windows graphical interface; Close-Up's file transfer and remote control use character-based approaches. Close-Up also requires the office PC to load a terminate-and-stay-resident program before loading Windows; other remote control

vendors have given up on TSRs because they can hog DOS memory and may conflict with other software such as network drivers. The TSR approach didn't cause problems in our tests, but when we tried to connect to a VGA-resolution office PC from an off-site system that was set up to expect a super-VGA, the off-site PC crashed.

Close-Up is also the only product here that's limited to a maximum of 800 by 600 resolution and 16 colors. On the plus side, the package supports more than 1000 modems, and uninstalling it requires simply deleting its files, since it makes no changes to your configuration files. *Norton-Lambert Corp.*, 805/964-6767 **Reader service no. 690**



LAPLINK LETS YOU EASILY PERFORM REMOTE CONTROL using modems, a LAN, a cable, or a wireless link.

LapLink 6.0 for Windows

PROS: Fastest remote control, easy to configure and use, strong file transfer capabilities

CONS: No drive mapping or printer redirection

Traveling Software's $129 LapLink is a snap to install and operate, and it delivered the fastest overall speed of any product we tested. Despite lacking two useful features—drive mapping and printer redirection—it easily earns a Best Buy recommendation.

The program's entire interface is so logically organized that you may not need to consult the manuals. You run the same software on each of your PCs, so all options are always available on both systems. The program's LinkBar is a toolbar that makes it easy to find the right connection method—including options for communicating by direct cable, by Traveling Software's AirShare wireless modules, by LAN, and by modem—and you don't need to reconfigure the software to change connection methods.

LapLink's origins as a file transfer program shine through in the way it lets you accomplish just about any imaginable transfer task, with a range of synchronization options. Though other packages here support cable connections, only LapLink comes with the serial and parallel cables you need.

LapLink has a few weaknesses. Unlike Carbon Copy, pcAnywhere, and ReachOut, it doesn't let you access your office PC's disks using drive mapping, and it's the only package here that can't redirect output meant for your office PC's printer to one connected to your off-site PC. There's also no way to restrict access to drives or directories—a problem only if you want to let others dial in to your PC.

If you must have these features, ReachOut is your best bet. But if you can live without them and want fast and easy remote control and potent file transfer options, LapLink is an excellent choice. *Traveling Software, Inc.*, 800/343-8080, 206/483-8088 **Reader service no. 691**

Norton pcAnywhere 2.0 for Windows

PROS: Simple user interface, broad feature set

CONS: Middling remote control speed, limited and slow drive mapping

Symantec's $129 Norton pcAnywhere 2.0 for Windows has many strengths: It's easy to

REMOTE ACCESS THE WINDOWS 95 WAY

Windows 95 is the first version of Windows with built-in tools designed with telecommuters in mind. These new features don't include true remote control—but if you just want to retrieve your office computer's files from an off-site PC, Windows 95 lets you do so without buying a stand-alone software package.

Key among Windows 95's telecommuting-oriented options is its ability to serve as a Dial-Up Networking client, which lets you use an off-site PC to tap into your office computer's resources via modem. To set up your office PC to accept incoming calls, you need Microsoft's Dial-Up Networking Server, a utility that's included in the $49.95 Microsoft Plus package of Windows 95 add-ons. Together these features let you access the office system's local and networked drives from your off-site PC, much as the drive-mapping features in Carbon Copy, pcAnywhere, and ReachOut do. (Dial-Up Networking can also be used to dial in to a LAN-based remote access server such as a Shiva LanRover, but you can use it even if your office PC isn't connected to a network.)

Installing the Dial-Up Networking Server on your office PC is a simple matter of selecting a check box in the Plus install routine, then telling Windows 95 to receive calls from off-site PCs. Setting up the remote system is just as easy, since a wizard steps you through the process; about all you need to know is the phone number of the office PC's modem.

As with the stand-alone packages reviewed here, both PCs need to be running and attached to modems and phone lines before you can initiate a remote access session. Once you're connected, the office PC's hard disks and network drives appear as additional drives on your off-site PC, so you can load and save office files from within applications running on the off-site system. Using Windows 95's Briefcase feature, you can also copy and synchronize multiple file versions between the two PCs, so you know you're always working with up-to-date information.

Not the Last Word in Remote Access

These tools are useful, but they certainly don't make separate remote control packages obsolete. Since Dial-Up Networking doesn't provide a true remote control link, you can't use it to run the office system's applications from your off-site PC, and working with applications that use large data files, such as databases, may prove too slow to be practical. And while you can tell Dial-Up Networking to share entire drives or directories across the remote link with either full or read-only access, it doesn't provide the wealth of security options available in packages such as Carbon Copy and ReachOut.

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install, uses well-organized controls, and has a wide range of features. Even so, it suffered in our tests because of its slow remote control speed and below-par drive mapping.

The package supports connections over popular LAN operating systems, the Internet, and ISDN lines, as well as by modem. Once you're connected, a clearly marked control panel displays options such as file transfer and chat mode.

Tranferring files with the program's drag-and-drop controls is a pleasure. Security features are fairly complete, including a data encryption option and the ability to restrict access to floppies, hard disks, and network drives. You can't, however, restrict access to specific directories or drives.

For all of pcAnywhere's attractions, its remote control performance was slow enough that common Windows actions, such as opening and closing windows, were a bit tedious. And although it's one of only three packages here that offer drive mapping, its one-way approach lets you map drives from the controlling system (usually the off-site PC) to the one being accessed (typically the office one), but not vice versa. Worse, drive-mapping performance was downright leaden—our Excel and WordPerfect tasks took more than twice as long to complete as they did with Carbon Copy's mapping feature. These flaws keep this otherwise worthy package from being a Best Buy. *Symantec Corp.*, 800/441-7234, 503/334-6054 **Reader service no. 692**

ReachOut 5.0

PROS: Generally good performance, complete and easy-to-use feature set

CONS: Getting drive mapping to work with Excel required a technical support call

Stac's ReachOut was fairly fast in our speed tests, and the breadth of its feature set was rivaled only by Carbon Copy's and pcAnywhere's. The winning blend of speed and features makes this package one of our two Best Buys—especially considering its low $99 street price.

ReachOut is easy to install and use, with a well-designed interface that helps you get up and running in just a few minutes. The program's remote control speed didn't

FEATURES COMPARISON LapLink and ReachOut Ease the Telecommuter's Burden

● = Yes ○ = No

Standard features	Carbon Copy 3.0 for Windows	Close-Up 6.0	LapLink 6.0 for Windows	Norton pcAnywhere 2.0 for Windows	ReachOut 5.0	Remotely Possible/ Dial 4.0
Street price[1]	$99	$125	$129	$129	$99	$169
Hard disk space required (MB)	4	1.5	5.5	6	6	1
Maximum resolution supported	1280 by 1024	800 by 600	1280 by 1024[2]	1280 by 1024[2]	2048 by 1280[2]	1600 by 1280
Maximum number of colors supported	16.8 million	16	16.8 million	16.8 million	256	16.8 million
Number of modems supported	555	1027	300+	250	300+	200+
Automatic modem sensing and configuration	●	port/baud rate only	○	○	○	○
Runs under Windows 95	●	●[3]	●	●	●	○
Remote access features						
Password protection	●	●	●	●	●	●
Host can dial back off-site PC	●	●	●	●	●	●
Restricts access to drives and directories	●	○	○	○[4]	●	○
Encryption	○	○	○	●	●	○
Drive mapping	●	○	○	●[5]	●	○
File synchronization	●	●	●	●	●	○
Chat mode	●	●	●	●	●	●
Scripting language	●	●	○	●	●	○
Printer redirection	●	●	○	●	●	●
Network protocols	IPX, NetBIOS	none[6]	IPX	IP, IPX	IP, IPX, NetBIOS	none[6]
Service and support						
Free support (days)	unlimited	unlimited	unlimited	90	90	unlimited
Weekday support (hours)	12	10	9	11	9	9
Weekend support	○	○	○	○	○	○
Toll-free phone support	○	○	○	●	○	○
Fax/online support	●/●	●/●	●/●	●/●	●/●	●/●

BEST BUY

[1] Vendor estimate.

[2] Highest resolution tested by vendor; theoretically no limit.

[3] Off-site PC only.

[4] Can lock out all hard disks, network drives, and floppy drives.

[5] Drives can be mapped only from guest to host.

[6] Available in separate version of package.

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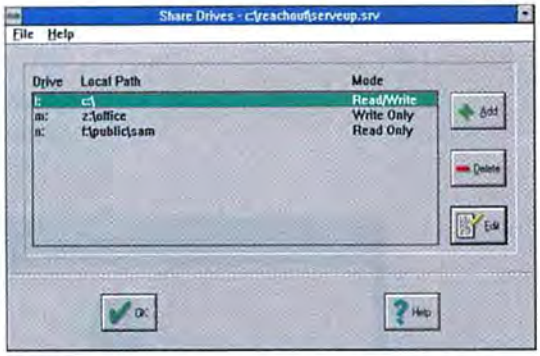
match that of LapLink or Close-Up, but it was good enough to let us touch-type comfortably. When you're connected to an office PC with a higher-resolution display than your off-site system, you can scroll its display in a window, pan the display, or scale it to fit on the lower-resolution screen.

The well-marked file manager always makes it clear which PC you're dealing with and which way files are moving. It's also easy to map office drives to your off-site PC, and ReachOut is the only package here other than Carbon Copy that lets you do so in both directions—so you can run your favorite applications on your off-site system and load data files from the office PC's drives, or access your off-site PC's disks from software you're controlling remotely from the office PC. We did have trouble getting the drive mapping feature to let us load remote files into Excel; Stac's technical support provided a work-around solution for this OLE-related problem.

ReachOut includes extensive security features suitable for corporate use, such as data encryption and the ability to limit log-in attempts. With lots of connection options—including modem, cellular, ISDN, LAN, and Internet—this package gives you everything you need to stay in touch with the office. *Stac Electronics*, 800/677-6232 **Reader service no. 693**



REACHOUT'S DRIVE MAPPING can fool your off-site PC into treating the office PC's drives like local disks.

Remotely Possible/Dial 4.0

PROS: Switching between Windows desktops is easy

CONS: Slowest performance, no drive mapping, weak file transfer utility

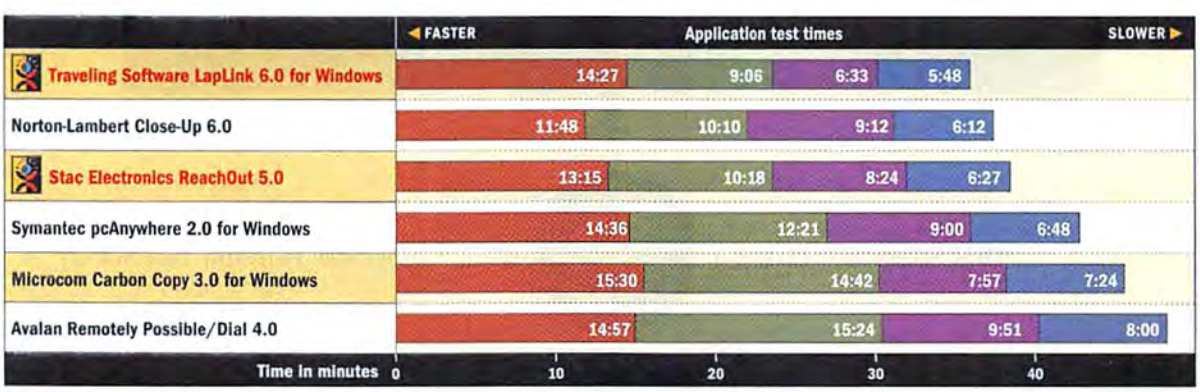
Avalan's Remotely Possible/Dial 4.0 was the slowest performer in our remote control tests, and it offers few of the amenities found in the best products here. Screen refreshes dragged, typing required pauses to let the PC catch up, and some features aren't very intuitive.

This package can connect only via modem (a separate LAN version is available), and it can't map drives or synchronize files between PCs. Rather than transferring files by simply dragging and dropping, you must create a file queue, then click cryptically marked buttons to finish the transfer.

Remotely Possible/Dial does have a clever solution to the basic remote control problem of juggling two Windows desktops. You see a small blinking square when using the office system; click it, and you're back at your off-site PC's own desktop. The package was also reliable and error-free in our tests, something that's still a pleasant surprise with remote control software.

At press time, Avalan planned to ship Remotely Possible/32 Modem Version by mid-November. The company says this 32-bit product offers better performance than Remotely Possible/Dial 4.0, plus such new features as a drag-and-drop file transfer system and the ability for multiple remote computers to dial into one system simultaneously. *Avalan Technology, Inc.*, 800/441-2281 **Reader service no. 694**

TEST REPORT LapLink Leads the Pack in Remote Control Performance



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Methodology

We tested remote control performance using a Pentium-75 PC with 16MB of RAM as the office PC and a DX4-100 notebook with 8MB of RAM as the off-site system. Connections were made using 28.8-kbps modems over a telephone line simulator. The four programs we ran under remote control represent a cross section of common Windows productivity tools: a word processor (Novell WordPerfect 6.1), a spreadsheet (Microsoft Excel 5.0), a database (Lotus Approach 3.0), and a personal information manager (Novell InfoCentral 1.1). In each application, we tracked how long it took to perform a series of typical tasks, including loading and saving files, reformatting and editing data, and scrolling through documents.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

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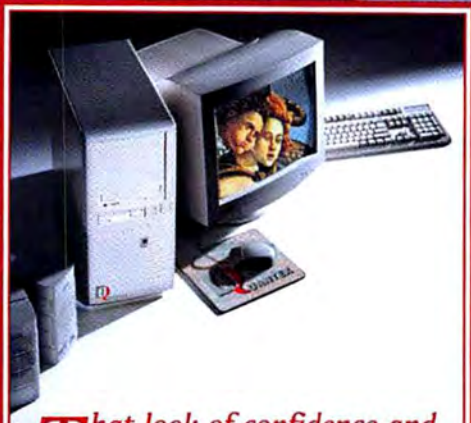

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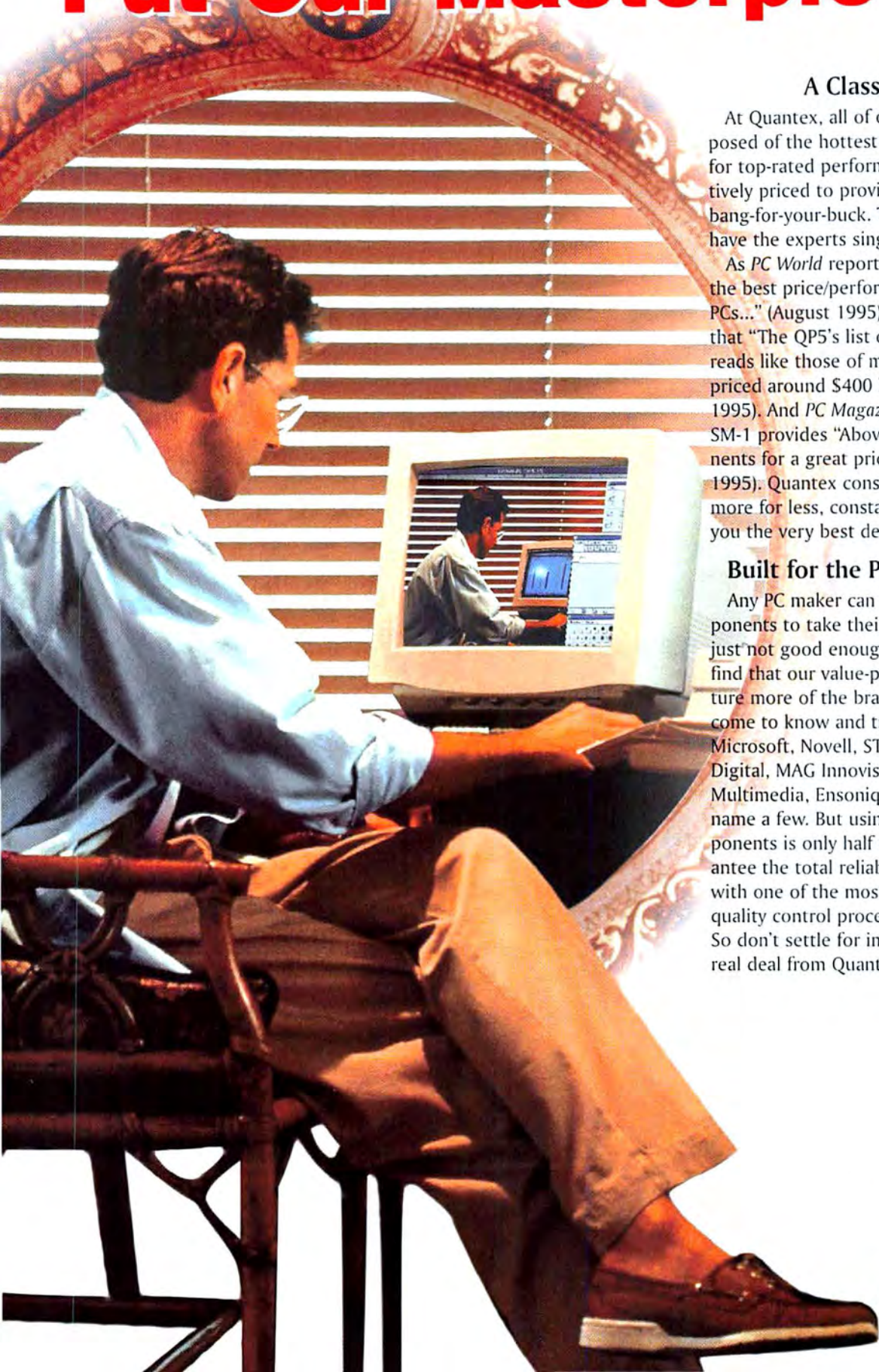

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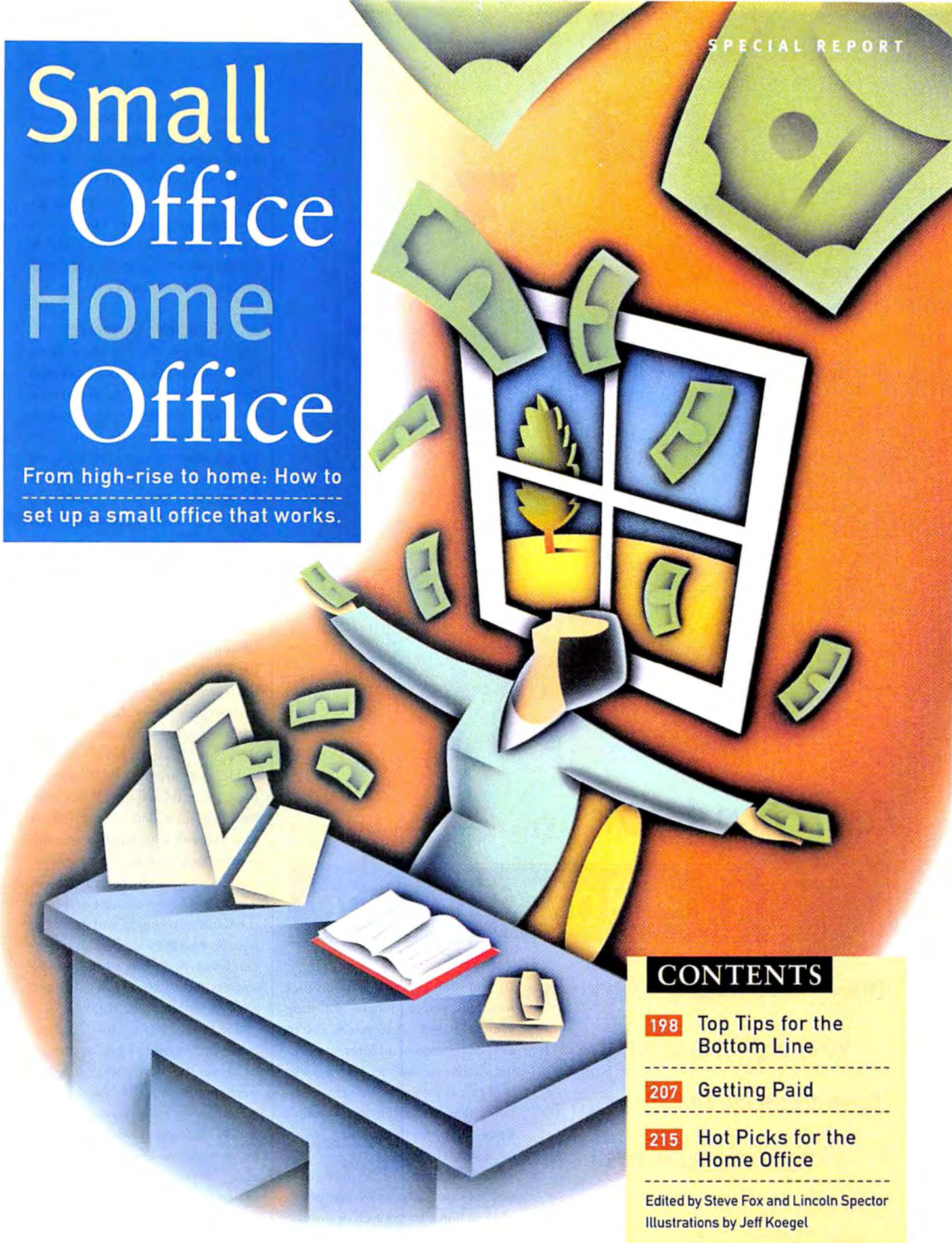
Small Office Home Office

From high-rise to home: How to set up a small office that works.



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Edited by Steve Fox and Lincoln Spector
Illustrations by Jeff Koegel

Top Tips for the Bottom Line

BY JEFFREY ROTHFEDER

There's no avoiding it. To keep your business solvent, you have to tackle the "A" word—accounting. Here's how.

If you don't know where your money is, you're probably throwing some of it away. And you're also in desperate need of a better accounting system. In fact, accounting is so tied to a company's financial well-being that without it, you wouldn't know what the bottom line is—or even if you have one.

But what kind of accounting is best for your company? Whether you work at home by yourself or oversee 100 employees, the basic principles are the same, even if the details are as different as a Studebaker and a Lamborghini. Check out how the representative fictional businesses below could have tackled their accounting predicaments. Their stories should offer guidelines for avoiding pitfalls and setting up the right kind of accounting system for you.

Curb Your Customers

For a company like Streetwalkers Anonymous, a two-person operation that takes the cats of the rich and famous for curbside outings, accounting is easy—or so its owners assumed. After reading a few books on the subject, Bill and Barbara Walker decided that all they needed was a basic, single-entry general ledger system, an arcane Dickensian term for simply keeping an ongoing journal of financial activity. All cash flowing out of the business is put on the right side of the ledger; money that should be coming in is entered on the left side. Then, at various times, the balance is calculated.

Month after month, the total on the left was higher than the total on the right, so Streetwalkers was profitable and thriving. Well, only on paper, as it turned out. When Barbara and Bill added two cat walkers and expanded to cover a second, somewhat less desirable neighborhood, they instantly ran into a bind. They didn't have enough money in the bank to pay bills and meet the payroll. And they learned an important lesson that many small-business owners fail to see: Don't mistake sales for money in the bank.

The ledger looked good, but because they recorded jobs as cash on hand, the Walkers didn't realize they were courting disaster. Many of their customers—particularly the new, less well heeled ones—were paying late, by as much as a month. Some of their older customers were also slow to part with cash, though in flusher times the Walkers hadn't noticed the late payments. In other words, the

ledger said the firm had enough money to cover its costs, but the checking account saw it differently.

Obviously, what Streetwalkers needed immediately was a bookkeeping system that could monitor accounts receivable—the money that customers owe the company. With an accounts receivable system, the Walkers could have put customers on a shorter leash, making it clear—through prompt invoices and follow-up phone calls—that they expected payment within 30 days. And for laggard customers, the Walkers could have sent second and third invoices that added an interest charge.

Equally important, the Walkers could have instituted a double-entry accounting system in which transactions are put into the ledger and also into a second account record that details the type of sale. Double entry provides revealing footnotes off the main journal so that sales on credit, for example, are not mistaken for money in pocket.

Farewell, Floyd

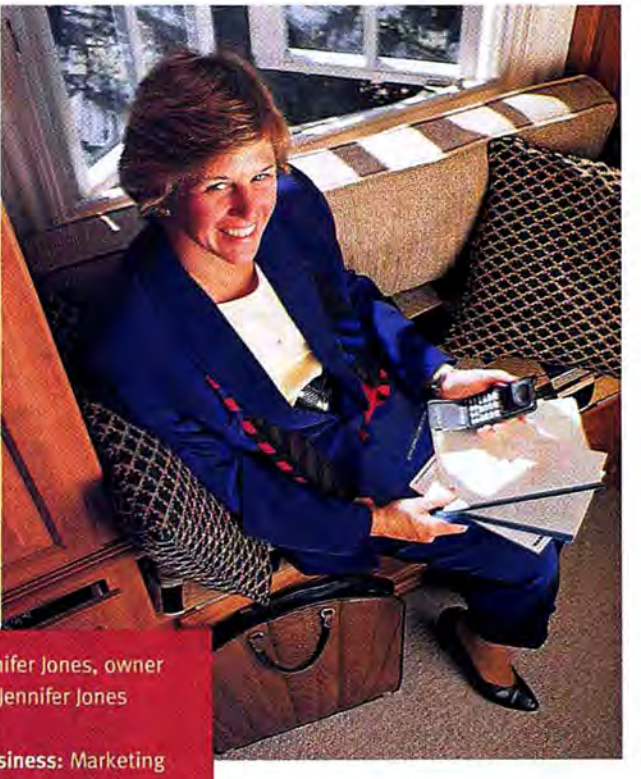
Besides more books, companies that get into Streetwalkers' predicament need something else: an accountant. In fact, experts say that the only small businesses that don't need an accountant are stable companies providing unchanging products or services to customers with unswerving loyalties. Sadly, there hasn't been a business like that since Floyd's Corner Barbershop closed its doors 20 years ago.

The rest of us should undertake the job of hiring an accountant with the same care we use for bringing in a new chief salesperson. Make sure you know what tasks you want done and are confident that your accountant can do them. Some possibilities: setting up the books, budgeting, tax preparation, and financial performance planning. To find the right person for the job, get recommendations from friends, do a background check to make sure there's nothing shady in the accountant's past like an infraction with the Securities and Exchange Commission, and review references carefully. And once you've identified a likely candidate, be sure to work out a fee structure that your business can afford.

Ideally, a good accountant should take the numbers work off your hands so you can focus on devising ways to make your company grow. But in any case, don't expect the numbers to simply go away. In fact, you'll likely find yourself saddled with a slew of new ones. After all, a good accountant should provide instant snapshots of your company's financial health from all angles. You can use these pictures to plan for the future, cure ailing operations, and avoid mistakes such as overspending on new inventory when the money isn't available to do so. Such analysis can be time-consuming but critical.

There's another compelling reason to keep an eye on your accountant's calculations: Not everyone is perfectly trustworthy—especially when money is involved. A small business that blindly entrusts the creation and upkeep of a bookkeeping system to an accountant is inviting embezzlement. Keep your eyes open.

For a small business, tracking cash flow is probably an accounting system's most important task. There's a delicate balance between what a firm spends to expand operations and



Name: Jennifer Jones, owner
Company: Jennifer Jones Consulting
Type of business: Marketing consulting firm
Location: Menlo Park, California
Year business started: 1989
Year incident happened: 1992

Who Can You Trust?

The story: "I ran a big agency for six years before starting my own business, so I'd always considered myself a pro at hiring professionals. I hired a professional accountant who worked for me for two years. I trusted her, so I didn't take the time to look back at the books. Then someone she was working for told me she had illegally bought computers with his business credit card. I immediately asked her if she had stolen money from me. She said no, then the next day admitted that she'd taken thousands of dollars. I fired her, but it was devastating. Because of this experience, when I hired my new financial adviser I looked into her licensing history, referenced her beyond belief, and even had her checked out with the FBI. It's sad; I'm not the kind of person who expects people to be cheats."

What has she learned? "That I was much too trusting. Also, I'll never allow anybody to have check-signing privileges again." —Leslie Crawford

how soon it generates enough sales from this effort to cover the costs. This balancing act often determines more than anything whether a start-up succeeds or hits the rocks.

Take what happened at Acme Blue Rocks, a small company that sells aqua-colored artificial pebbles to adorn fish ponds at Polynesian restaurants and miniature fountains in shopping malls. Roy Acme woke up one morning to find his company on the brink of disaster. He had just completed a three-month plan to broaden his core business by offering new rainbow-dappled rocks, when three key clients—two eateries and a strip mall—unexpectedly canceled their accounts because business was weak. Suddenly, suppliers that provided the extruded plastic and dye for the ersatz pebbles, plus two trade publications that carried Acme's advertisements, were demanding the money due them. Even Roy's brother-in-law, an early backer, was clamoring to get his cash back.

Small-business lesson number one: Don't mistake sales for money in the bank.

Roy had no choice. He had to dip into his credit line at the bank, paying 10 percent to borrow money.

That led to a classic small-business owner's catastrophe. To defray the costs of its loans, Acme Blue Rocks was forced to charge $11 for a bag of rocks that used to sell for $10. Customers, faced with a sudden price hike, looked to Acme's competition. To make matters worse, the company was overpaying for raw materials: It was making payments after 30 days and incurring late charges, and suppliers had been upping their prices over the past few years. Rocks were now $8.50 per bag, wholesale. But because Acme had no accounting system to speak of, the company's salespeople hadn't passed these increased costs along to customers; in fact, they were even cutting deals to meet monthly quotas.

If the company had spent even a short time developing an accounting system, it could have quickly identified its cash flow crisis and tried to convince suppliers to cut the prices they charge in exchange for getting payments in 15 days. And president Roy could have taken the tough step of cutting sales commissions by the amount below list price that his reps were letting customers pay. He could have instantly slashed the cost of making blue rocks to a sustainable level, stemming the need to dip into the bank credit line. The result: no interest charges and a more robust bottom line while Roy figured out a way to get new customers.

Targeting Inventory

Hit the Mark Inc. had a problem far different from Acme Blue Rocks'. This small business, which manufactures bows and arrows, has plenty of customers and a diversified product line that includes dozens of variations, from flexible, rubberized items for children to crossbows for professional hunters. But Hit the Mark's owner, Carol Archer, figuratively shot herself in the foot. Like many start-up owners, she was unsure of which raw materials she had on hand, how much she had paid for them, and what additional materials she needed. This paucity of information invariably led to slowdowns in manufacturing, late deliveries, and wasteful overstocking of material for slow-selling products.

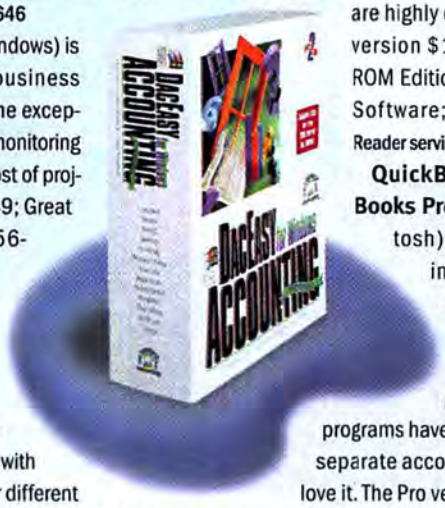
An accounting inventory system would have been on the money for

Money Minders: Accounting Software

DacEasy for Windows is a basic accounting package that also includes contact management, reminder notes, an automatic dialer, fax capabilities, and timed-release billing. It handles payroll processing as well. $119; DacEasy Inc.; 800/322-3279. Reader service no. 646

Great Plains Profit (Windows) is a fully integrated small-business accounting program with one exceptional strength: It's great for monitoring cash flow and tracking the cost of projects from start to finish. $249; Great Plains Software; 800/456-0025. Reader service no. 647

M.Y.O.B. Accounting (Windows) packs a plethora of accounting features into a mere 6MB on your hard drive. Easy to set up and use, the program comes with more than 100 templates for different types of businesses. It uses flowcharts for entering invoices and customer payments. One notable weakness: Its sales tax capacity is limited. $139; Bestware; 800/322-6962. Reader service no. 648



Peachtree Complete Accounting (DOS) and **Peachtree Accounting for Windows** are two more fully integrated small-business accounting programs. They're particularly strong in tracking inventories and accounts receivables and are highly customizable. DOS version $199, Windows CD-ROM Edition $129; Peachtree Software; 800/228-0068. Reader service no. 649

QuickBooks and **QuickBooks Pro** (Windows, Macintosh) claim to be more intuitive than most accounting packages. For example, instead of using a general ledger, the programs have you work directly in separate accounts. Some people love it. The Pro version includes time tracking, estimating, and job costing. $99 regular, $189 Pro; Intuit; 800/816-8025.

For more information about all the products in this sidebar, circle reader service no. 906.

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Your True Choice

Hit the Mark. By tracking the movement of raw materials from basic inventory to finished product, Carol could have gleaned some eye-opening and useful information.

For instance, Hit the Mark would have discovered that of the $17,000 in spruce, pine, and mahogany it purchased at the beginning of each month, the spruce and mahogany were used up in just 15 days, while it took nearly 8 weeks to deplete the pine. Carol could have made some key decisions that are obvious in light of this data but difficult to spot without it. Among them, Hit the Mark could have chosen to sell the excess pine to a third party, discontinue the pine bow because of low customer demand, or bargain with the supplier for a bulk discount on spruce and mahogany because Hit the Mark uses so much of it.

Name: Beverly Wilson, financial director
Company: Spevco
Type of business: Mobile exhibit manufacturer
Location: Pfafftown, North Carolina
Year business started: 1979
Year change was made: 1992

Seeking Software Help

Sure, you can reach these sorts of decisions by manually entering tiny numbers in eye-blurring columns, but you probably have better ways to spend your time. And unless your small office is doing some mighty big business, you won't need to bring in an accountant to help out 24 hours a day, seven days a week—which is where picking the right software comes in. A decent accounting package will let you produce better and more sophisticated reports—and be more certain of accuracy—than an old-fashioned manual entry system. And if you're running the same software, you and your accountant will be able to exchange information with ease.

There are dozens of PC applications that handle accounting for small businesses, and most of them are fairly accessible, if a bit time-consuming at first (see "Money Minders: Accounting Software"). In fact, in nearly every program, one entry into the general ledger dispatches data to whichever separate account files you set up. Then you can create numerous varied reports at your leisure and run what-if scenarios to determine the current financial health of your company and how it will fare under a series of hypothetical decisions.

Before buying a package, be sure to run the software through transactions that are typical for your business. Do you require foreign currency calculations, multiple warehouse tracking, customized reports, inventory tracking, or multicomputer access to data? How many years of history will you need to store? When you've determined your needs, read any product reviews you can get your hands on and ask about any demos at your local software store or user group. Finally, make sure the software you buy has a money-back guarantee, just in case it turns out not to fit the bill.

Once you've got your accounting software, you can roll up your sleeves and get down to business. Don't expect any magic here—it's still your know-how and hard work that will make it all possible. But at least you'll have the information you need to make intelligent decisions. Otherwise you might just as well be playing craps with your business.

Jeffrey Rothfeder is the national news editor at Bloomberg Business News *and author of* Privacy for Sale *(Simon & Schuster, 1992, 800/983-5333). Leslie Crawford is a San Francisco–based freelance writer.*

Farming Out the Payroll

The story: "Since we started, we've gone from having 5 employees to 65. Using manual accounting methods was too labor-intensive. Also, since you're concerned with the confidentiality of the payroll, someone higher up in the company had to do it, which certainly wasn't cost-effective. I decided to outsource the whole payroll system. We found National Payroll Corporation, which provides electronic direct-deposit software that interfaces with our accounting software. Now I have a part-time payroll person who comes in one day every two weeks. To transfer an electronic payroll takes just 5 minutes."

Why she's glad she did it: "It doesn't just help the company, it helps the employees. Now over 60 percent of our employees are using the direct-deposit system, which allows them to access their money anytime." —L. C.

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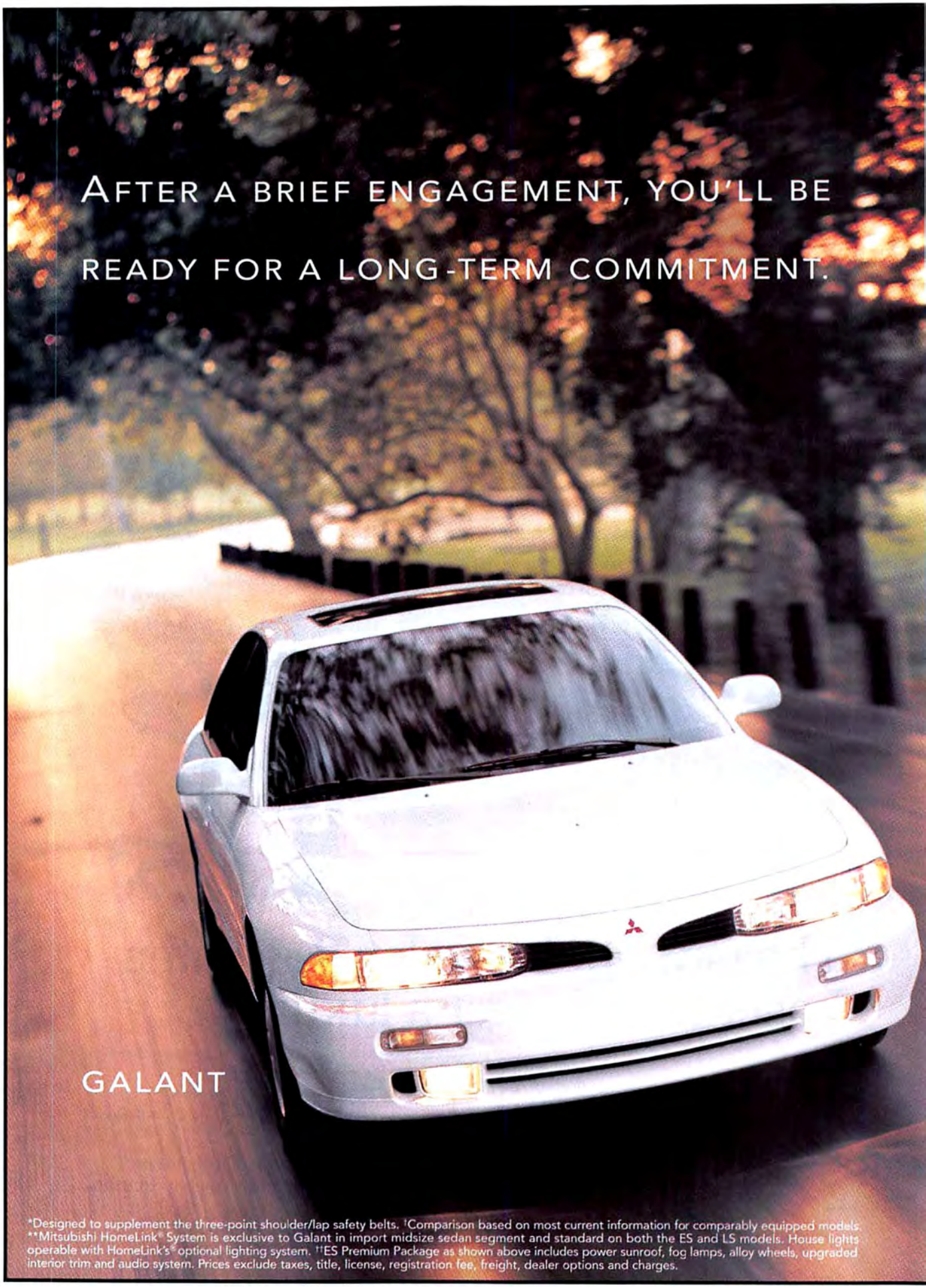

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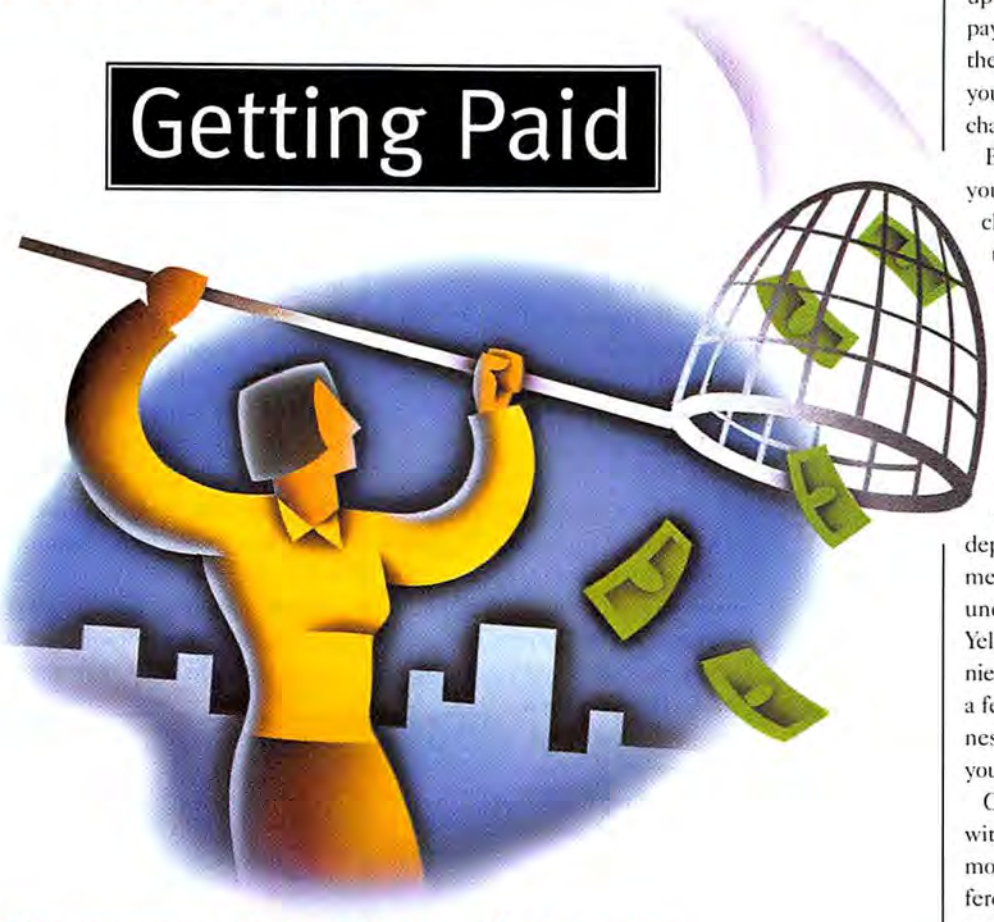
BY KRISTIN ANUNDSEN

Getting Paid



No money, no business. Use these strategies to collect from your customers.

Whatever your reasons for being in business—fulfilling your potential, making the world a better place, having fun—you've got to make money. And you can't make money if you don't collect it.

This obvious fact seems to escape some first-time entrepreneurs. "I can't tell you how many clients I have who say they're too busy to send out bills," says Claude Whitmyer, a San Francisco–based small-business consultant.

Failure to get your clients and customers to pay promptly can dam up your cash flow and sink your business. One solution is to insist on getting paid in cash: no bank delays, no invoicing, no credit verification, no need to follow up. However, cash is seldom convenient for customers, whose satisfaction is key to your success. Here are some suggestions to help you smooth out the process and keep you solvent.

Giving Credit Where It's Due

Consider credit cards. Many people prefer using plastic, so you might boost your business volume and sales opportunities if you accept it. Also, in many cases you'll get paid faster. It can take months for a payment to wind its way through a corporate client's bureaucratic purchase order and check-issuing system, whereas your card-payment funds will typically be available in two to ten business days. On the other hand, getting a credit card system set up may involve hassles, you have to pay assorted fees and percentages to the bank, and you may not get all of your payments because of fraud and charge-backs.

Before you can accept credit cards, you need to be certified as a "merchant" by a financial institution or the credit card company itself. This can sometimes be a problem, especially for home-based businesses that are less than two years old. Start at the local bank where you have an account established and where people know you. If you're unsuccessful there, try using an independent credit service as an intermediary; these are often found under "credit card systems" in the Yellow Pages. Some of these companies provide consulting services, and a few even specialize in small businesses. However, they may charge you higher fees than a bank would.

Once you have merchant status with one institution, others will be more willing to recognize you. Different banks and credit card service companies operate in different ways to exact their commissions. Before you settle on a bank, you'll need to know the following details:

- What percentage of the charged amount the bank or credit company takes. This is generally 2 to 4 percent, depending on your credit history, the nature of your business, and whether you plan to accept credit card payments over the phone.
- The full list of fees. Depending on your business and bank, you could be expected to pay application, annual, minimum, per-transaction, service, and/or cancellation fees. It's best to find out exactly what is required.
- How quickly you'll have access to your money.
- What devices are required for processing credit card payments, and how much they cost to rent, buy, or lease.

One danger in accepting credit cards is that you can't recover unau-

Collection No-No's

How aggressively can you go after deadbeats? The federal Fair Debt Collection Practices Act specifies what collection agencies cannot do. Depending on which state you live in, some of these restrictions may also apply to you.

Don't make the debtor's name known publicly—for example, by posting flyers, informing others about the debt, or sending postcards rather than collection letters.

Don't threaten to sue or to report the debtor to a credit bureau if you have no intention of doing so.

Don't make collection calls more frequently than once a week.

Don't call very early or very late in the day—say, before 8 in the morning or after 9 in the evening.

Don't use abusive language.

Don't misrepresent yourself—for example, by implying that you or whoever sends a payment request for you is an attorney, if that isn't actually the case.

thorized charges made by credit card thieves (except for the first $50, for which the legitimate cardholder is liable). For that reason, you need to be careful in verifying signatures, something that is impossible to do with phone orders.

Another danger is the charge-back, in which a cardholder claims to be dissatisfied and complains to their bank, which will then suspend the charge to the cardholder, investigate the situation, and ask you for reimbursement if the customer does not relent. Card companies understandably do not enjoy this process and may demand a fee for each charge-back. If this sort of thing happens too often, they may even close your account. In the meantime, charge-backs will make it difficult for you to track your cash flow.

The Electronic Age

Don't forget about today's high-tech options for payment. For example, you can create a home page on the World Wide Web where customers can place orders and pay by credit card. However, you may still have to verify credit by telephone. In addition, some customers are reluctant to release their credit card numbers into hacker-infested cyberspace.

In April 1996 new standards go into effect that should make Visa and MasterCard payments over the Internet more secure. At that time you'll be able to acquire specialized credit card accounts with built-in encryption. Cardholder and card issuer will each hold two keys, one "public," or published like a phone number, the other private, like the PIN number you use with your ATM card. Only the private key can decrypt the public one. Thus, each party will be able to verify the identity of the other, knowing that no one else can receive (or send) the transaction message.

"This will enable home offices to use the same types of secure payment links that only the largest companies could afford before," says Kurt Stammberger, spokesperson for RSA Data Security, the company that designed the encryption keys.

Banks are teaming up with makers of personal finance software such as Intuit, Microsoft, and Computer Associates to offer online payment mechanisms. Using their computers, your customers will eventually be able to transfer money directly to your bank.

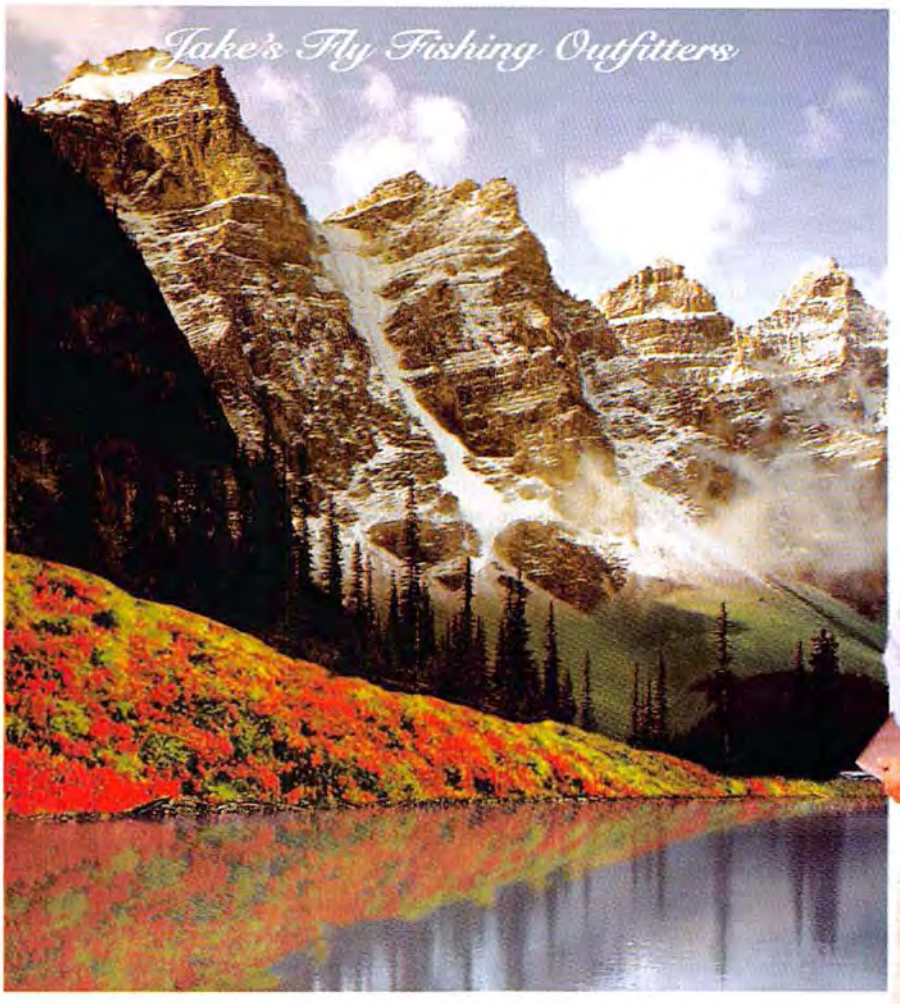
One company in the forefront of all this activity is Checkfree Corporation. Checkfree offers various methods for consumers to pay their bills online, including over the Internet.

Name: Bill Murphy, president
Company: Clos LaChance Wines
Type of business: Winery
Location: Saratoga, California
Year business started: 1987
Year change was made: 1995

Getting Paid Over the Net

The story: "Our traditional channels are through distributors, retailers, and restaurants, but few people order directly over the Net by sending us their credit card number online. Most of them send us an e-mail message and say they want, for example, a case of chardonnay. Then we contact them to arrange payment. Once the Internet gets a secure method of doing online transactions, the customers will be able to send their credit card number directly. I expect that will happen in the near future—and when it does happen, we anticipate we'll be doing a significant amount of business over the Net."

Why he's glad he did it: "Electronic shopping is great for getting new customers in an innovative way—people who have never heard of us can find out more about us. So we're able to build a much broader name than we could otherwise." —Leslie Crawford



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Should you file a lawsuit? That depends on how angry you are and what you're owed.

Getting Paid on Time

No matter how easy you make it for customers to pay their bills, some will find the task too daunting to undertake. Here are a few tricks to make sure those people and companies pay up:

- Maintain a positive relationship with your contact at the client company, as well as with the person who actually cuts the checks. Be sure you know which one should receive your invoices.
- Before extending credit, have the customer fill out a credit application and then run a credit check.
- Don't ship a product until you have the *authenticated* payment in hand—that is, you've received cash or have made sure the client hasn't exceeded his or her credit limit. Alternatively, you could ship COD.
- If you're a service business, be sure you and your customer are completely clear about the work to be done and the payment terms before you begin a job. Put your agreement into a formal contract or a letter.
- In the written agreement, specify that a portion of the money is to be paid up front. If the work will take more than a month, make sure to stipulate interim payments.
- Send bills out as soon as the work (or the agreed-upon segment of the work) is done, rather than at the end of the month. You don't want to risk missing the client's payment cutoff date and having to wait another two weeks to a month.
- Put "Due on receipt" at the bottom of the invoice.
- Offer a discount of 2 percent if the bill is paid within ten days. This is cheaper than borrowing money to cover your cash flow, and much more attractive to the client than demanding a late fee if payment is not made by the agreed-upon time.

Slow Payers and Nonpayers

Suppose your customer is late in paying? Well, what exactly do you mean by "late"?

This is not a frivolous question. If you can't define what you mean by the term, how can your customer? Some clients are willing to pay shortly after they receive an invoice. But some large companies have a policy of waiting 30, 60, or even 90 days, no matter what your invoice says. Find out what the policy is, then—if the policy is intractable—build it into your cash flow estimates. "Late" should mean a couple of weeks after the date you expect payment.

To nudge late payers, develop a series of past-due notices, attached to or printed on a copy of the original invoice, to send every two weeks, beginning when the bill falls into the "late" category. All notices should be polite and nonthreatening, but the series should escalate in firmness.

A courteous phone call can work wonders, and it gives you a chance to clear up any misunderstandings that may have caused delays. Be sure to ask when payment can be expected. Alternating letters with telephone calls is an effective tactic used by many businesses and collection agencies.

When clients claim they can't afford to pay right now, ask for partial payment or a series of partial payments. Even a small amount is better than nothing. You might even offer to stop by in person to collect the check.

If bills are piling up and you've received no payment from the customer for more than 90 days, deliver some bad news: "I'm sorry, but I'm afraid I can't accept any more work

Money Matters: Billing Software

The Invoice Store (DOS) is designed more for product-based than service businesses, as it focuses on inventory management and shipping records. The program can create customized reports, too. $95; Software Store Products; 800/232-8561. **Reader service no. 635**

MyAdvancedInvoices & Estimates (Windows, Macintosh) is easy to use and focuses specifically on invoicing and payment tracking. You can print on a variety of forms, include a message, specify sales taxes for customers in different states, and use the data to prepare customized reports and track a customer's payment history. $59.95; MySoftware Co.; 800/325-3508. **Reader service no. 636**

OnAccount (Macintosh) lets you easily dress up your invoices with artwork. But because it employs balance-forward accounting (that is, payments are recorded against client account totals), OnAccount won't let you match payments to individual invoices. $99; White Crow Software; 802/658-1270. **Reader service no. 637**

TimeSheet Professional (Windows) is particularly useful if you charge customers by the hour. You can run it as an individual program or from a network. It produces customizable summary and detail reports and invoices. $199.95 (single-user version); TimeSlips Corp.; 800/285-0999. **Reader service no. 638**

For more information about all the products in this sidebar, circle reader service no. 904.

The MultiPASS™ 1000 Document Processing System. It combines a laser-quality printer, a plain paper fax, a PC fax, a scanner, a personal copier and a telephone — all in one compact unit. MultiPASS Desktop Manager for Windows™ software is included to manage printing, faxing, scanning and telephone functions. Plus you can print and fax from the Windows applications you're using now. MultiPASS is everything you need next to your PC. Everything.

It's a Printer. The MultiPASS 1000 incorporates 360 x 360 dpi award-winning Bubble Jet™ technology. It has a front loading, adjustable 200-sheet letter/legal paper cassette. The easy-to-replace, self-cleaning BX-2 (BC-02) ink cartridge snaps into place. And the MultiPASS 1000 supports popular printer emulations from Canon, IBM® and EPSON.®

It's a Plain Paper Fax. You get a 30-sheet auto document feeder for hard-copy faxing. Transmission speed is only 9 sec/page.* The MultiPASS 1000 uses Canon's Ultra High Quality (UHQ™) technology allowing it to scan photos in 64 halftone levels. Reception memory is 70 pages* and transmission memory is 50 pages.* What's more, you can send faxes even when your PC is off.

It's a PC Fax. With the MultiPASS 1000, you can fax directly from your PC at a speed faster than most faxboards. You can receive faxes while you're printing or when your PC is off. You can view faxes with zoom and full rotation, then save, print, forward or delete them. You can create a custom cover sheet and a virtually unlimited fax address book.

It's a Scanner. The MultiPASS 1000 offers TWAIN-compliant scanning with 200 x 200 dpi resolution and seven-level contrast control. It is compatible with most OCR software, enabling you to edit imported text without keying it in. And the 30-sheet auto document feeder lets you easily scan multi-page documents.

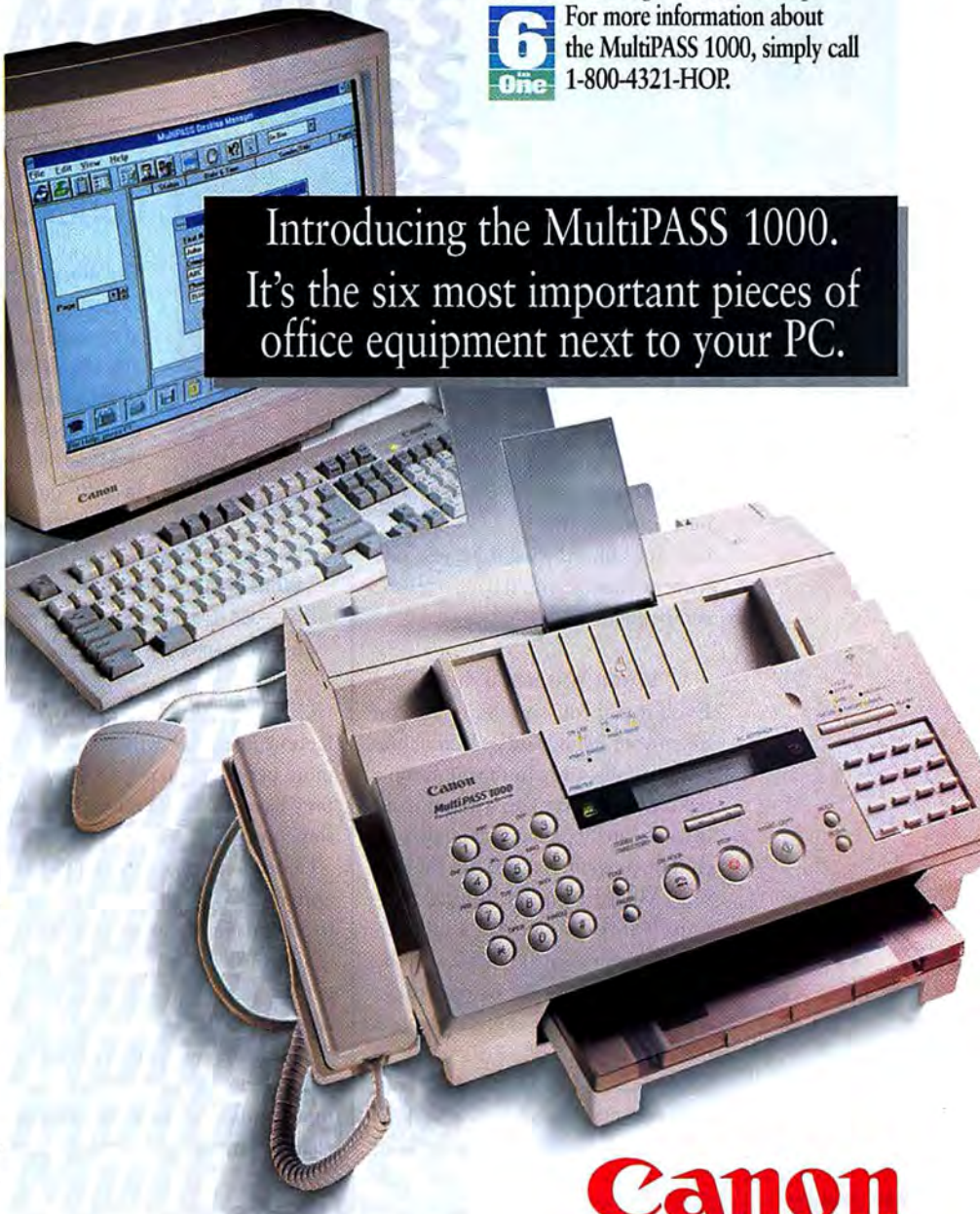
Circle 50 on reader service card

*Based on CCITT #1 Chart (Standard Mode) © 1995 Canon U.S.A., Inc. Canon is a registered trademark and MultiPASS, Bubble Jet and UHQ are trademarks of Canon Inc. Windows is a trademark of Microsoft Corporation. IBM is a registered trademark of International Business Machines Corporation. EPSON is a registered trademark of Seiko Epson Corporation. Canon computer not included.

It's a Copier. You can make up to 99 laser-quality plain paper copies. The automatic document feeder holds 30 sheets and the front-loading, adjustable paper cassette holds 200 letter– or legal–size sheets. Canon's exclusive UHQ technology produces excellent copies of fine text and graphics.

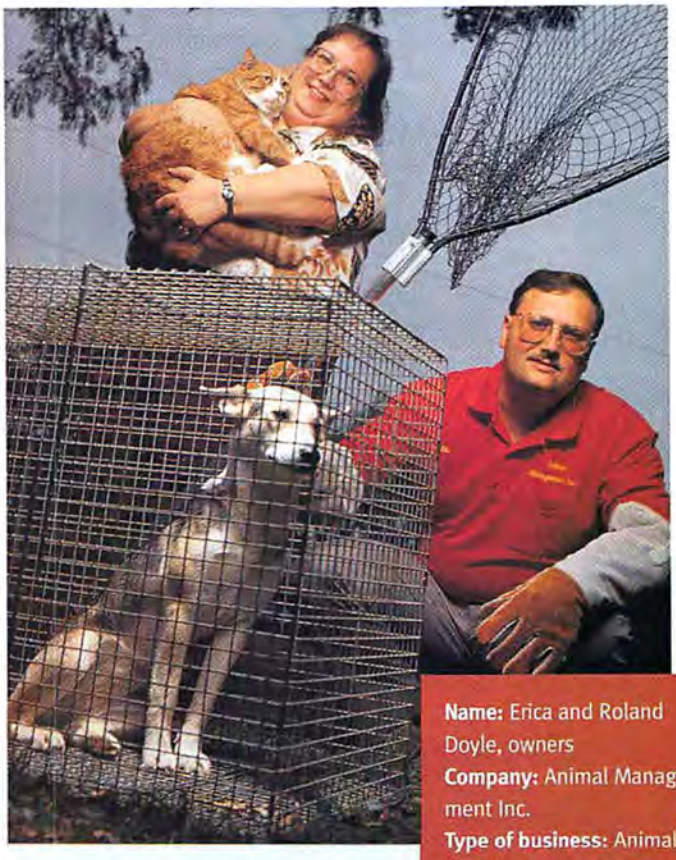
It's a full-featured Telephone. The MultiPASS 1000 telephone has on-hook dialing. You get a virtually unlimited telephone address book for point-and-click dialing, plus coded speed dialing to 80 locations. It has a Distinctive Ring Pattern Detector for use with special telephone company services. Plus it has a hold button with melody and an answering machine hookup.

For more information about the MultiPASS 1000, simply call 1-800-4321-HOP.



Introducing the MultiPASS 1000. It's the six most important pieces of office equipment next to your PC.

Canon



Name: Erica and Roland Doyle, owners
Company: Animal Management Inc.
Type of business: Animal handling equipment manufacturer and distributor
Location: Mechanicsburg, Pennsylvania
Year business started: 1987
Year change was made: 1994

from you until you have paid my outstanding invoice(s)." And don't worry if that particular client leaves you for someone else—with a customer like that, it'll be just one more advantage you'll have over the competition.

When You Need Help

Even if you fully intend to stay on top of your billing and collecting, the task may slip away from you. Keep a tickler file to alert you when unpaid invoices are 30, 60, and 90 days old. (Billing programs can do this for you; see "Money Matters: Billing Software.") If you notice that a substantial number of unpaid bills are in the "elderly" categories, or that these categories are growing, you have a cash flow problem. Either you're falling behind in your billing, or your customer relationships need work. If you're far behind or if you need to send more than 20 or 30 invoices per month, consider hiring someone on a part-time or full-time basis to send the bills and follow up on them.

Because gentle reminders won't work on deadbeats, you may want to turn these problem clients over to a collection agency. Such agencies use a set of official-sounding notices interspersed with telephone calls, which may worry or embarrass your clients enough to make them pony up. Also, collection agencies will probably be more persistent than you. However, they have no more authority to force someone to pay than you do.

Collection agencies usually charge a small fee per collection letter or 20 to 50 percent of the amount they actually succeed in collecting. If you decide to go with an agency, shop around to get the best deal.

Taking the matter to court is a last-ditch option, expensive in terms of time and/or money. Small-claims court won't require attorney fees, but the amount must be under the limit set in your state or region—typically $5000 or so—and you must serve (or hire someone to serve) the summons in the customer's legal jurisdiction.

Even if the judgment is in your favor, so that the customer is legally obligated to pay, they may balk or delay. On the other hand, many people are sufficiently intimidated by the threat of court time to settle at the sight of a summons.

Should you file a lawsuit? That depends on how angry you are, how much money is owed, and how much money you have. Coming to a compromise with the debtor will probably be less expensive than "winning" a court battle. Also, remember that you can write off a bad debt on your taxes.

Your professional or industry association, or its individual members, may have information about perennial deadbeats who should be avoided. For other customers, the best way to preclude payment problems is to be friendly, fair, and prompt yourself—in billing as well as in providing your product or service.

Kristin Anundsen is a freelance writer based in San Francisco.

Finding the Right Collection Agency

The story: "We accumulated $5000 in outstanding bills... for a small home business like ours, that's a lot. We try hard to work with our customers—arrange a payment plan—and only after we've tried every possible solution do we turn a customer over to a collection agency. And we've learned that the cheapest agency isn't always the best. The first one we used said they'd take 25 percent, where most other agencies take 40. They never collected, so we didn't end up saving anything. Then we went to a collection agency that charges 40 percent and we've been more successful with them."

What did they learn? "My best advice is don't wait too long to start collecting past-due bills. You have to keep on top of customers who haven't paid, because then they know you're not going to forget about the debt." —L. C.

Everybody said printers would eventually get this good.

Introducing the OL600e.

The first inexpensive personal business printer to go really fast and really sharp.

It prints 6 fast pages per minute of sharp 600 dpi-class output.

It runs on Windows® and DOS.

And it's the only printer that can do it at this price ($399* in the U.S.).

Shop around. You'll see.

Then call 1-800-OKI-TEAM ext. 622 for a dealer near you and a print sample.

6 pages per minute.

600 dots-per-inch class output.

Windows and DOS compatible.

5 Year LED printhead limited warranty.

100 sheet paper tray standard.

Multi-purpose feeder and 250 sheet universal tray optional.

21 years of experience and over 7 million printers sold.

For a full spec sheet, our Fax Back number is 1-800-654-6651. Ask for document 1014.

YOUR BUSINESS HAS NEVER LOOKED BETTER.™

(http://www.okidata.com)

*Estimated retail price. Actual price may vary.

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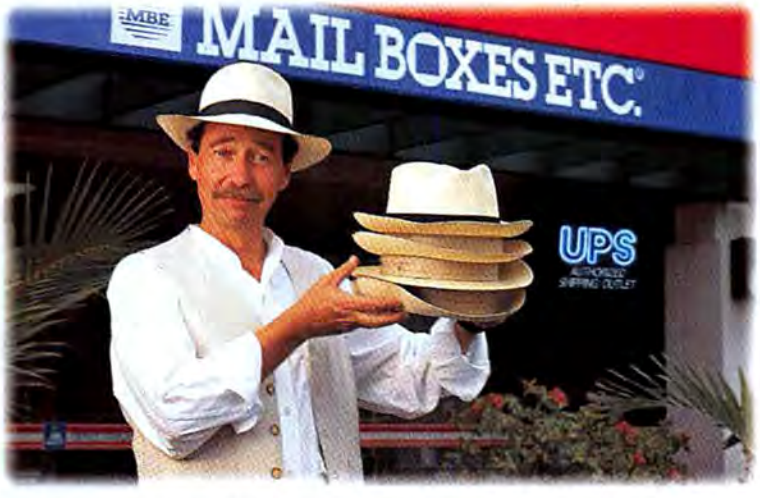
The New

OKIDATA

a Division of Oki America, Inc.

OL600e Perfect Personal Printer.

If you think a $10,000 hat is rare, try finding someone you trust to ship it.



Brent Black trusts Mail Boxes Etc.® to pack his rare Montecristi Finos® and ship them worldwide.

To Brent Black, Montecristi Finos® are more than just the world's finest Panama hats. They're an endangered species. "There are fewer than a dozen traditional weavers left in Montecristi, Ecuador who can craft the finest quality hats. By creating a market and, in turn, increasing demand, I hope to encourage more people to learn the weaving techniques and carry on the tradition."

After hand-picking the $200 to $10,000 hats in Ecuador, Brent brings them back to John Fay's Kailua, Hawaii Mail Boxes Etc.® for expert packing and international shipping via UPS.®

"Not only does John treat the hats like the works of art they are, he understands they're not just packages, they're my business."

MBE's expert packing is backed by the full range of UPS shipping services. From rapid overnight delivery to scheduled ground service to reaching destinations all over the world, MBE is your UPS connection.

We also provide full-service mailboxes, high quality copies, faxes, office supplies and more.

Mail Boxes Etc. has the support services you need, whether you're trying to save time, money, or even a dying art form. To find a Mail Boxes Etc. near you call 1-800-789-4MBE.

MBE MAIL BOXES ETC.®

It's not *what* we do. It's *how* we do it.™

Franchises available 1-800-456-0414

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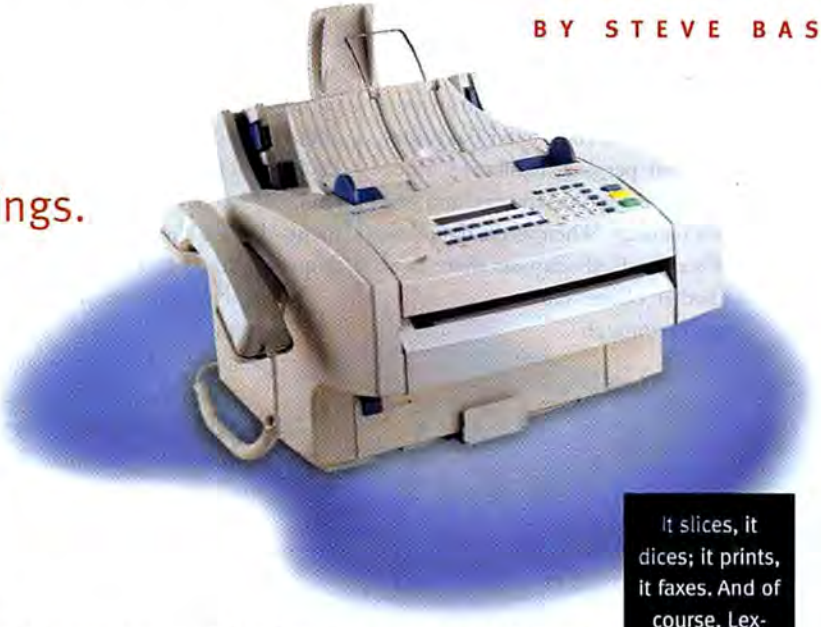
Circle 142 on reader service card

Hot Picks

for the Home Office

BY STEVE BASS



It slices, it dices; it prints, it faxes. And of course, Lexmark's Medley 4x doubles as a phone as well.

These are a few of our favorite things.

Expense Reports Made Easy

I just filled out my expense report for this article and enjoyed—no, *had fun*—doing it. That's because I got Intuit's ExpensAble to do the tedious parts of the chore. Like all of Intuit's products, ExpensAble makes data entry a breeze, with convenient, precompleted lists of typical expenses, such as hotels, airlines, and car rental firms. The program also tracks the mileage of my frequent auto trips, walks me through the various charges on my hotel bills, fills in data from past entries, and even exchanges data with Quicken for Windows and exports it to Excel. I can choose from 20 expense report templates; ExpensAble performs all the calculations for a client and generates the report. If I thought that I could get away with it, I'd fly to Italy just to test ExpensAble's foreign currency conversion. ExpensAble $49.95; Intuit; 800/624-8742, 415/322-0573.

Color Printing With the Kitchen Sink

Want a color printer that doubles as a fax machine and a scanner? Would it help if it were also a modem and, in a pinch, a copier? Okay, it's also a telephone. Lexmark's Medley 4x fits comfortably in one corner of your desk, combining all six devices into a 15-by-15-by-12-inch package that's street priced at $799. It prints at a sharp 300 by 300 dpi with 16 million colors and at 600 by 300 dpi with 256 shades of gray. To test the Medley's multifunctionality, I had a friend send me a two-page fax while I printed a complex color document. Without missing a beat, the fax arrived and parked itself in the Medley's memory until my file was done printing. The unit holds 150 sheets of paper and prints monochrome at 3 pages per minute. It's got 12 built-in fonts, sends and receives faxes at 14.4 kilobits per second, and offers 300-by-300-dpi TWAIN-compliant scanning resolution and a 60-page memory. With the included fax software, I can also send and receive faxes directly from my PC. Lexmark provides toll-free tech support and promises a replacement unit the next business day if the Medley fails in the first year of use. Too bad it's such a lousy coffeemaker. Medley 4x $999; Lexmark Int'l; 800/358-5835.

Reader service no. 656

Short Tail, Long Mouse

Need to spend time on the road but still haven't adjusted to your notebook's ersatz mouse? Ignore the trackball and check out Mouse2Go, a unique mouse with a short 20-inch cord and a high 400-by-400-dpi resolution. The two-button unit is about the size of a Microsoft Mouse, but thanks to its high resolution, it needs less space to roam. It's ideal for air travel: I just clamp the included 4-by-4-inch hard-surface mouse

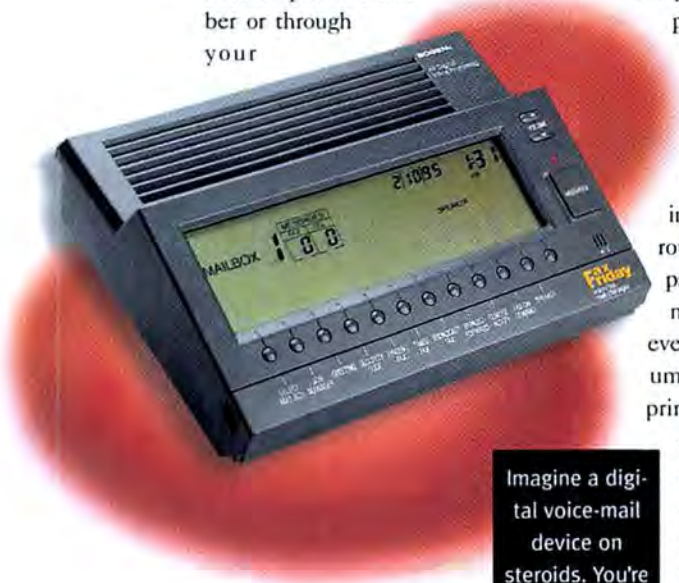
pad onto the side of my notebook. The mouse comes with a 6-foot extension cable so I can use it with my desktop PC, too. Mouse2Go $69.95; Merritt Computer Products, Inc.; 214/339-0753, 214/339-1313 (fax).

Reader service no. 655

Voice Mail for the Masses

Even if you hate voice mail, you've just got to check out Bogen's FaxFriday FR-3110. The size of an answering machine, the digital FaxFriday has four personal mailboxes, three boxes for announcements, and one box for faxes. When you're out of the office, the FaxFriday can alert you at another phone number or through your pager that you've received voice mail or a fax. If you have only one phone line, the FaxFriday amicably coexists with your PC, determining whether the call is data, voice, or fax. If your business would benefit from fax on demand, the FaxFriday handles 12 fax-back mailboxes. Timed fax broadcasting is available. And if you're really cruel, you can give your customers tacky on-hold music by connecting the unit to a radio or CD player. Call 800/829-5932 for a demo. FaxFriday FR-3110 $600; Bogen Communications; 201/934-8500, 201/934-9832 (fax).

Reader service no. 657



Imagine a digital voice-mail device on steroids. You're thinking of the FaxFriday.

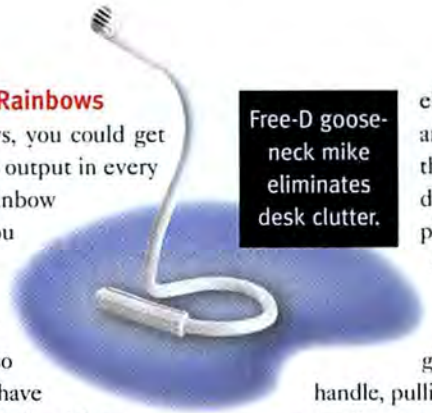
Printing Rainbows

In the old days, you could get your printer to output in every color of the rainbow—as long as you chose black. Nowadays, though, color printers are so cheap you can have one on your desk without taking out a second mortgage. For about $549 on the street, Hewlett-Packard's DeskJet 855C produces stunning 300-by-300-dpi color documents that are almost photographic in quality. Blacks also come out razor sharp at 600 dpi. The DeskJet's printing speed was a real surprise for me: 7 pages per minute in black text, and 3 pages per minute in color. I printed a few holiday greeting cards that included photos—some with roughly 30 percent of the page covered—in less than 2 minutes per page. And my everyday black-and-white documents just flew out of the printer. I was able to stuff 150 sheets of paper into the paper tray, and when I was ready to pay my bills I could print up to 15 envelopes at a time. The DeskJet 855C is one impressive printer, and it also works with a Macintosh. HP DeskJet 855C $663; Hewlett-Packard; 800/752-0900.

Reader service no. 658

Clearing Off the Desk

My desk is covered with stuff—computer speakers, phones, staplers—and behind everything, I just know there's an alligator waiting to leap out and grab me. But I found a couple of neat gadgets to help me eliminate desk clutter and reclaim some of my precious real estate. First on my list is Multiform's Telescoping Arm. This 360-degree swiveling and locking arm attaches to the edge of my desk, and a telephone clamps onto its tray. When I need to use the phone, I grab the tray's handle, pulling it toward me; when I'm done, I push the telescoping arm into itself and out of the way. Cool. Next, I got my sound card's microphone off the desk by attaching MIDI Land's Free-D gooseneck microphone to the side of my monitor. The mike's design lets me twist it out of the way when I'm not using it. Now all I need is an alligator clip. Telescoping Arm $143.95; Multiform Products; 800/382-8113, 904/363-8300 (fax).



Free-D gooseneck mike eliminates desk clutter.

Reader service no. 659

Free-D Model FD-01 Microphone $29.95; MIDI Land Inc.; 909/592-1168, 909/592-6159 (fax).

Reader service no. 660

How Do You Spell R-E-L-I-E-F?

Just when I think I'm doing okay, my wife's birding report uses the phrase *fulvous duck*, or I get stuck describing how to find the *xiphoid process* for a CPR manual. Word for Windows' spelling checker usually suits me fine, but some words are just too weird—or perhaps I should say *recondite*—for it to handle. That's where Merriam-Webster's Collegiate Dictionary, Tenth Edition and Collegiate Thesaurus on CD-ROM comes in. It's a hefty tome with over 160,000 entries, as well as 130,000 synonyms and antonyms. If I'm in my word processor and struggling with a word, a tap on a user-definable hot key sends the highlighted word straight to the dictionary. Not only can I check out the word's spelling, history, and pronunciation, but I can jump to the thesaurus. And in my spare time, I use the rhyming dictionary and play Crosswire and Word Crazy, two games included

After failing to program his VCR for the last time, Tiny welcomed the simplicity of his HP ScanJet scanner.

Introducing the HP ScanJet 4c

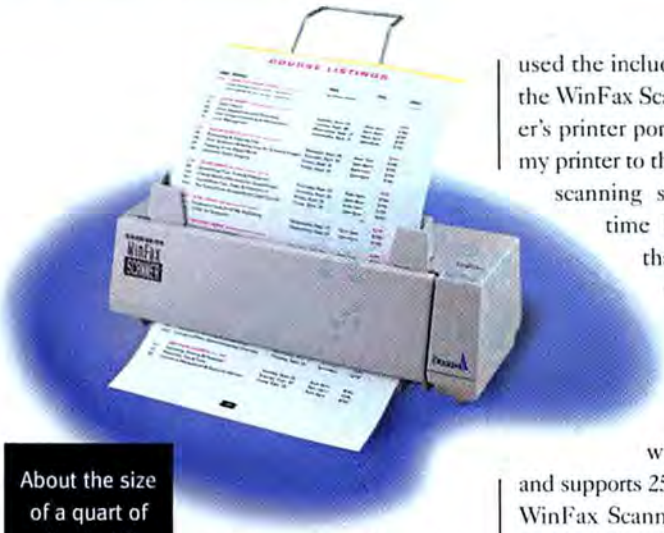
From set up to start up, from software installation to image capture, the HP ScanJet 4c makes the whole scanning process easier. 2400-dpi enhanced resolution (600-dpi optical), internal 30-bit color, and 1,024 levels of gray produce documents that are rich, detailed, and impactful. The HP ScanJet 4c also includes image-editing software, OCR software for text recognition, and new software for electronic file distribution and management. For more information, call 1-800-SCANJET, Ext. 1022†

$995*

The easiest thing you'll do all day.

*Estimated U.S. retail prices. Actual price may vary. †In Canada, call 1-800-387-3867, Dept. 265.
Contact us on the World Wide Web at http://www.hp.com/info/1022 ©1995 Hewlett-Packard PE12580

HEWLETT® PACKARD



About the size of a quart of milk, the WinFax Scanner is a handy way to get hard copy into your PC.

with the product. If you don't have a CD-ROM drive, the dictionary and thesaurus are available on floppies. Oh, and about *fulvous duck* and *xiphoid process?* Just look 'em up. Merriam-Webster's Collegiate Dictionary, Tenth Edition and Collegiate Thesaurus on CD-ROM $49.95; Merriam-Webster, Inc.; 413/734-3134, 413/731-5979 (fax).

Reader service no. 661

A Fax Made in Heaven

Using a fax-modem is convenient. But what happens when you need to fax, say, a newspaper article or a page from a catalog? Delrina's WinFax Scanner is an inexpensive, versatile solution. For approximately $329 discounted (less a $30 rebate effective through December 31, 1995), the scanner works just like a miniature fax machine. Only a little bit bigger than a quart container of milk, it has a 10-page automatic document feeder, provides 100- to 300-dpi resolution, and handles line art and 256 shades of gray. The scanner accepts documents ranging in size from business cards up to legal-size pages. Installing it was not a problem: I used the included cable to connect the WinFax Scanner to my computer's printer port, and then attached my printer to the scanner. I have the scanning software start every time I load Windows so that I can make use of the scanner's "instant on" feature. The software is TWAIN compliant (so you can use it with other programs) and supports 25 popular file formats. WinFax Scanner $329 discounted; Delrina; 800/734-2379, 408/363-2345, 408/363-2340 (fax).

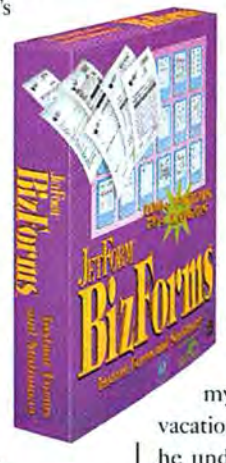
Reader service no. 662

Get the point with Spectrum RingMouse.

Making Forms Follow Function

It's a rare day when clients ask me for a line-item quote; it's even more unusual for them to want a detailed time sheet. But when a customer asks, I deliver. And instead of trying to create my own forms, I use one of JetForm's BizForms. For about $50, the software offers more than 100 well-designed business forms, including purchase orders, mailing labels, time sheets, invoices, statements, packing lists, and estimates. It even provides templates for business cards. The program automatically inserts all my standard information, including a logo, then lets me enter data by simply tabbing to each field on the form. When I'm done, a click of the mouse lets me review the form, print it, or fax it off to my customer. BizForms $49.95; JetForm; 800/367-6375, 603/532-8641, 603/924-9441 (fax).

Reader service no. 663



Of Mice and Fingers

Doctors agree: Mousing causes physical problems. So I slipped the Spectrum RingMouse, a ring that can tell your computer what you're pointing at, onto my index finger and did away with the rodent. Pretty amazing. The device uses a small, flat receiver that sits on top of the computer screen and tracks the ring's movements. Once I got the hang of it, pointing and clicking was easy. I used the Spectrum RingMouse as a regular mouse, though the special software gives me three-dimensional control over the *z*-axis by moving my hand away from the screen. On the downside, the RingMouse can't use the standard Microsoft mouse drivers—you have to use Kantek's software. Spectrum RingMouse $99.95; Kantek; 516/593-3212, 516/593-3295 (fax).

Reader service no. 664

Hearing Uncle Harry

Speakerphones often sound wretched, but not AT&T's high-quality Speakerphone 870. To emulate a business conference call, I tested the 870 at a family party, getting five aunts and uncles into my office to chat with a relative vacationing in Europe. Remarkably, he understood us all—even Uncle Harry, who mumbles. The phone also has a traditional handset, a 32-number memory, automatic redial, a hold button, and an LCD screen showing the duration of the call. This must be the best way to reach out and touch someone—hands free. AT&T Speakerphone 870 $149; AT&T; 800/222-3111.

Reader service no. 665

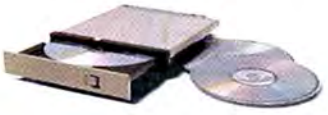
PC World *Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. He can be reached on PC World Online.*

For more information about all products in this article, circle reader service no. 907.

GET PENTIUM.

Pentium™ Power:
The super-quick Pentium™ processor is designed specifically for notebooks and is engineered to perform 91% faster than 75MHz Intel DX4™ processors.

GET CD-ROM.



CD-ROM to Go:
The power of multimedia is all packed up and ready to go. The Satellite Pro™ 400CDT comes with an integrated, modular Quad-Speed CD-ROM drive that you can swap with the floppy drive in seconds†. Or plug in the floppy drive externally and use both.

GET GOING.

Satellite Pro™

The New Satellite Pro™ with Modular CD-ROM.

Lithium Ion Battery:
Toshiba's long-life Lithium Ion battery provides many hours of power while you travel.

Enhanced Port Replicator:
Now you only need one computer. The new, optional Enhanced Port Replicator provides two Type III PC Card slots, and allows one-step connection to your desktop environment.

Built-in Power Supply:
A built-in power supply means you don't have to carry a bulky external AC adapter. This slim power cord is all you need.

FEATURES:

400CDT:
- 10.4" dia. color active matrix display
- Integrated modular Quad-Speed CD-ROM
- Modular 3.5" FDD included

400CS*:
- 10.4" dia. color dual-scan display
- Integrated modular 3.5" FDD
- Optional modular Quad-Speed CD-ROM

BOTH MODELS:
- 75MHz Pentium™ processor (2.9v)
- Supports 24-bit true color (16.7 million colors)
- 810 Million Bytes (≈772MB) HDD
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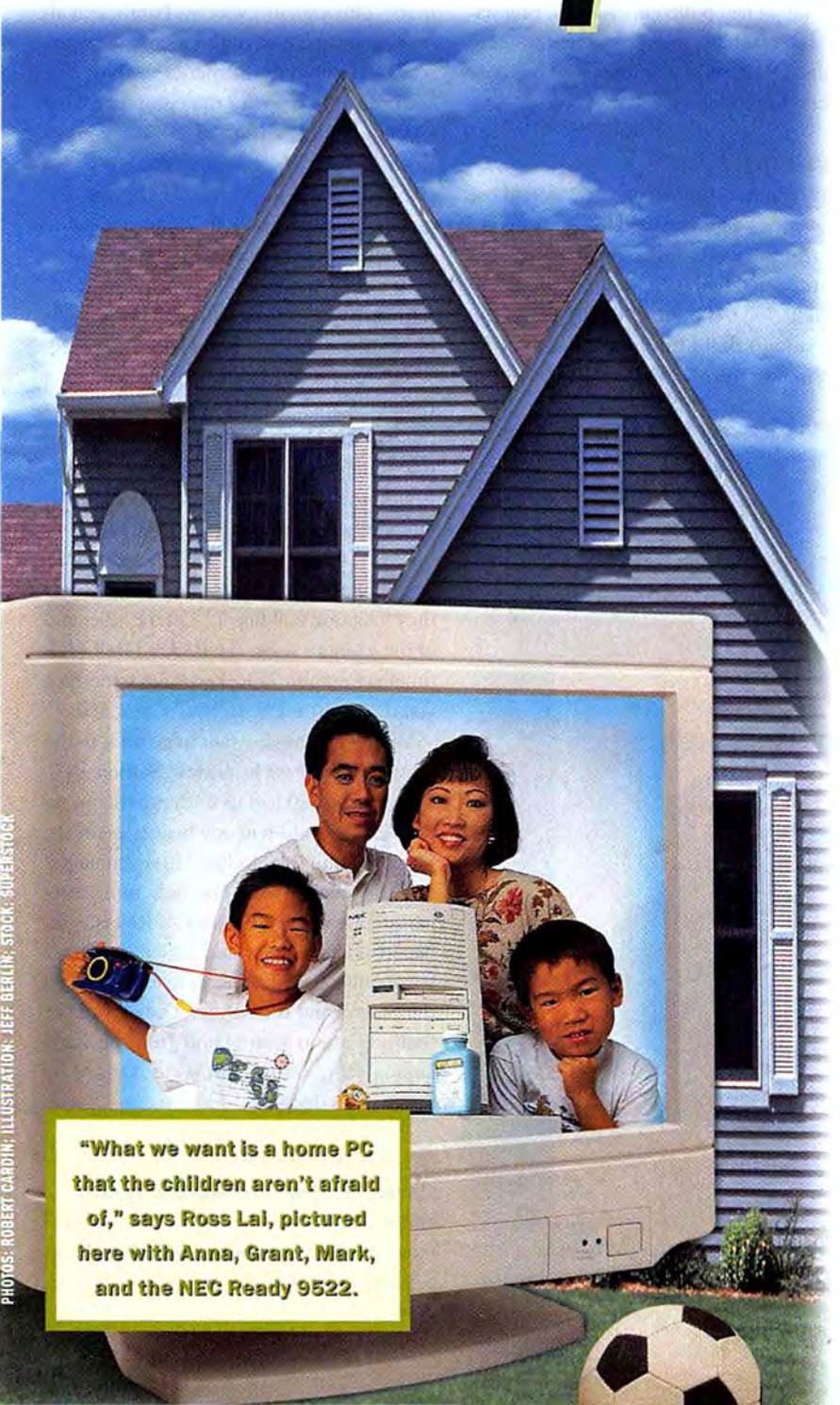


"What we want is a home PC that the children aren't afraid of," says Ross Lai, pictured here with Anna, Grant, Mark, and the NEC Ready 9522.

PHOTOS: ROBERT CARDIN; ILLUSTRATION: JEFF BERLIN; STOCK: SUPERSTOCK

All those slick new home PCs look cool, but are they good buys? We asked six families to test-drive the latest from HP, Acer, NEC, and others. Here's what they found.

By James A. Martin

Halfway through the night, something went wrong. The mood quickly went from curious to panicked as we realized that the Pentium computer we were sitting in front of was, most likely, dead.

It all started when *PC World* invited six families—all in the market for new PCs—to come by a local hotel suite and taste-test a half dozen brand-new computers designed for the home. This new breed of PC comes loaded with the latest and greatest: Windows 95, quad-speed CD-ROM drives, CD-ROM titles, speakerphones and answering machines, high-speed modems, state-of-the-art sound, and even infrared remote controls on a couple of the systems. Some of them boasted sleek designer looks and friendly interfaces to help novices learn the ways of the computer. All were reputed to be easier to assemble and use than conventional nerd-bound PCs.

Our plan was to let the families loose, step back to watch how they reacted, and at the end of the evening ask them for their favorites. Coupling their votes with our own

performance evaluations, software compatibility tests, and service and reliability ratings, we'd choose a Best Buy.

Our high-tech taste testing had been going smoothly until we found ourselves looking at the blue screen of death—a sure sign that this computer had gone looking for its maker. We're all pretty computer-savvy, so we dug into our bag of tricks: We pressed <Ctrl>-<Esc> to bring up Windows 95's Start menu, checked the hardware for improper connections, and hit the restart button. But the thing wasn't breathing.

Just as we were preparing to give up, four-year-old Grant Lai delivered a few strategic mouse clicks. To our amazement, the PC hummed to life.

Mere coincidence? Or is young Grant a brilliant computer engineer squeezed into a sample-size body? Who knows. One thing, however, became clear from this part of our experiment: The computer, no matter how state-of-the-art it has become, can be just as temperamental as ever. But the days when a PC could intimidate children, computer neophytes, and anyone lacking a programming degree are now over.

We learned a lot of other things, too. We noticed that while there was some consistency to how the families reacted to the PCs, there were also disagreements—sometimes within the same household.

Later, after everyone had voted for their favorite computer, we would hit them with *PC World*'s service and reliability rankings and performance tests. In a few cases the PCs deemed most likely to keep cash registers ringing had pulled in disappointing service and reliability ratings and performance results. Did it make a difference to our taste testers? Keep reading and find out.

Looks That Thrill

The computers we had on hand were those the average shopper would likely encounter on a trip to a local retailer: the Acer America Aspire, the Digital Starion 920, the HP Pavilion 7020, the NEC Ready 9522, and the Packard Bell Multimedia Pentium 75. We threw in the Micron P90 Home MPC to see if a mail-order model stood a chance against the friendlier retail models. Unfortunately, we were unable to get review units of the new IBM Aptiva or Compaq's new line of Presarios in time for the event. But we did run the Aptiva through our performance and hands-on assembly evaluations; for details, see "Test Report: Home PCs From Start-up to Finish Line."

"We're into things that look neat," said dentist Ross Lai, Grant's father. "You want whatever you buy for the home to look good in it." This explains why his family, and almost everyone else in the room, had to be pried away from Acer America's Aspire.

The Aspire does for the computer what Cher does for Oscar-night fashion. With its sleek, curved, charcoal-gray design (it also comes in emerald green), Acer's new PC makes a blatant bid for attention—and makes everything else seem a bit dowdy.

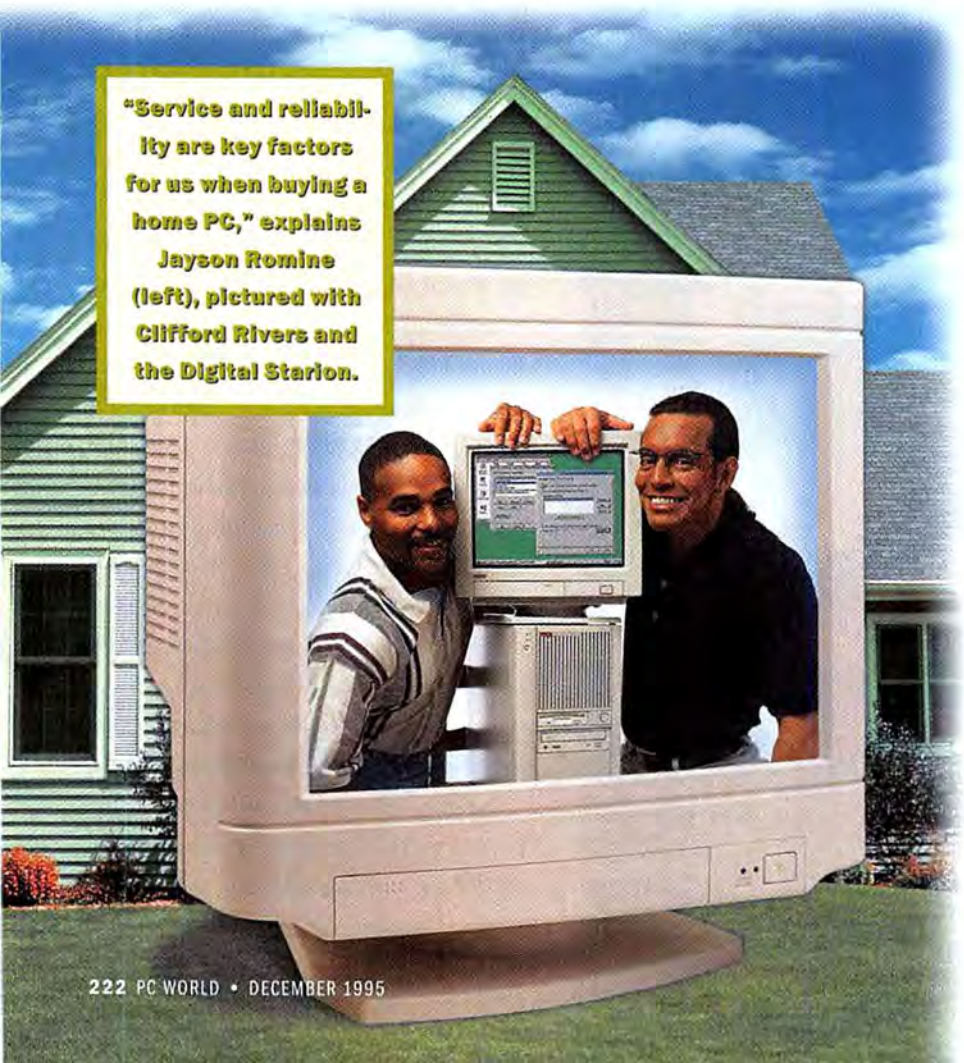
"It's got a modern, high-tech look that's softened by the curves. The whole design is pleasing to the eye," remarked fashion designer Amy Kuschel, who knows a thing or two about appearances. While many agreed the Aspire's Darth Vader design was cool, it left some cold. For fiction writer Thaisa Frank, the Aspire was an abomination. "It offended my sensibilities," Frank said.

Ross Lai noted the NEC Ready 9522's "streamlined, quality design—it looks like they took care building it." On the other end of the glamour scale, the Packard Bell Multimedia Pentium 75 looked "like something you'd pick up at Price Club," Lai added.

And Digital might want to go back to the drawing board with its new Starion PCs. The Starion 920 had its enthusiasts, but no one felt it would win any beauty contests. "It's ugly, and it looks like old technology," said Kuschel of the Starion's miniature-mainframe veneer. Clifford A. Rivers, a rehabilitation counselor, and Jayson Romine, a transportation contractor, were torn between the Starion and the Aspire. They loved the Starion's audio system and JBL speakers, among other things, but were dazzled by the Aspire's design.

It's About Space

Clutter? We have enough of it, thank you, and we don't want our home PCs to add more. The Aspire's monitor, which includes a built-in microphone and stereo speakers



"Service and reliability are key factors for us when buying a home PC," explains Jayson Romine (left), pictured with Clifford Rivers and the Digital Starion.

located underneath the display, scored major points for freeing up desk space.

"Initially, I liked the way the HP's speakers were on the side of the monitor," observed Laura Dufort, an artist. "But now that I've seen how Acer America does it, I can't stand the HP."

While Rivers and Romine appreciated the all-in-one Aspire and Pavilion monitors, they cared more about sound quality than desktop space. "The Starion's JBL speakers are like a big boom box," said Romine. "The speakers alone are worth several hundred dollars," he added. "Next to them the HP, and some of the other speakers I've heard, sound like transistor radios."

Start Me Up, Tie Me Down

Our taste testers agreed that simplicity and ease of use were just as important—if not more so—than good looks. Overall, they told us that the current crop of PCs were noticeably easier to use than their predecessors. Most of the families, in fact, had unpacked and set up their chosen PCs within 15 or 20 minutes, thanks to color-coded connection cables and graphical diagrams.

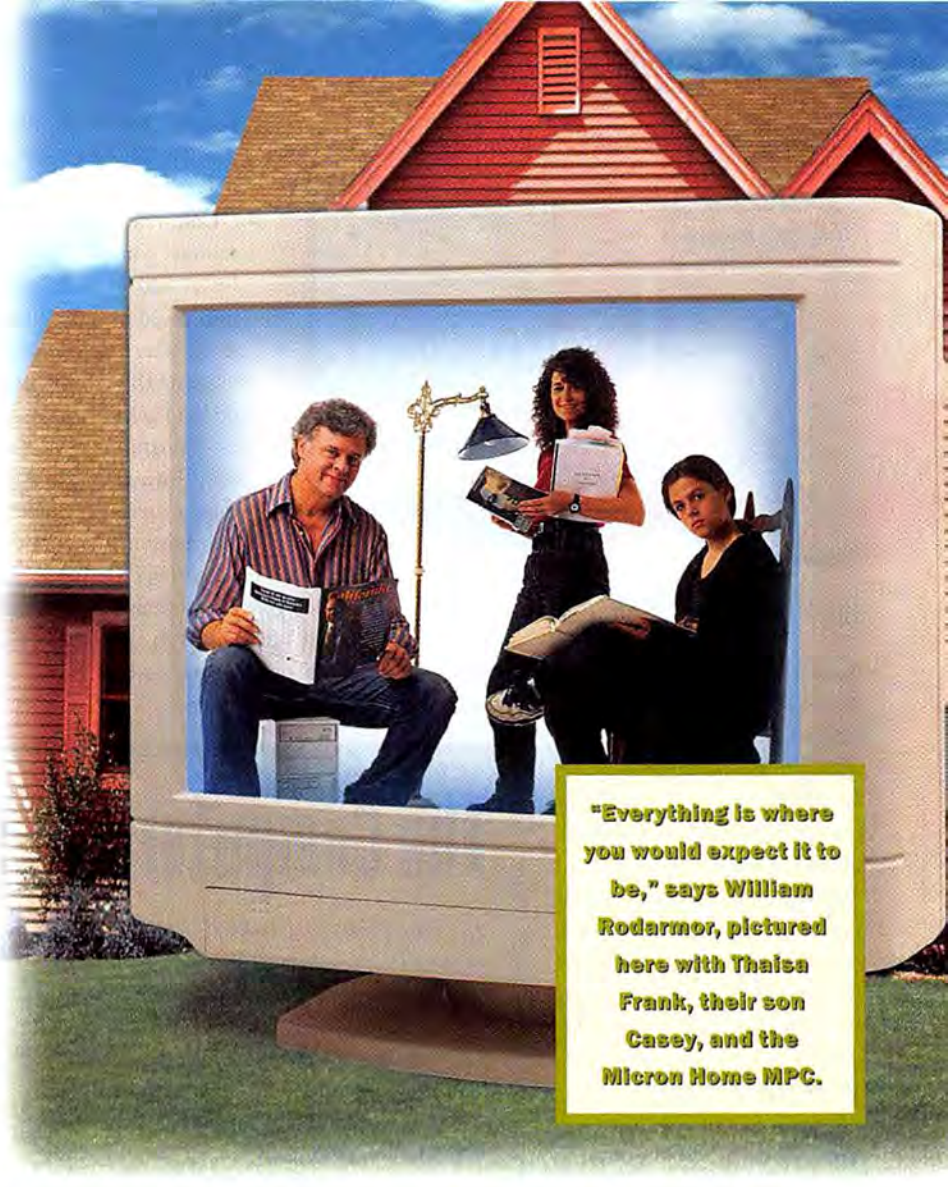
"I have an older 486 at home, and heaven help me if I ever have to move it," confided editor William Rodarmor. "But with these new PCs, everything is where you would expect it to be."

Not everyone found these PCs so easy to put together, however. Homemaker Rebecca Brucia, a former sales and marketing executive, used the terms "driving me crazy" and "fit to be tied" during her experience setting up the Packard Bell. For more than 15 minutes, Brucia wrestled gamely with the computer's instructions.

"I'm an intelligent person," Brucia said. "I can set up a computer. Most of the things I was trying to do were actually very simple. But the instructions were hard to follow."

Show, Don't Tell

Setting up the hardware is one thing, but finding your way around all the preinstalled software can be quite another. To that end, makers of home PCs have added a graphical interface shell—often their own—that sits atop Windows 95. The idea is that Windows 95, despite its ease-of-use improvements over Windows 3.1, can be confusing, and the graphical shell makes navigation easier for everybody in the family. For the most part, these interfaces seemed to work well.



"Everything is where you would expect it to be," says William Rodarmor, pictured here with Thaisa Frank, their son Casey, and the Micron Home MPC.

Hewlett-Packard's Personal Page multimedia interface generated the most debate. Fourteen-year-old Isaiah Dufort liked HP's Personal Page at first. "The interface makes it so I don't have to go looking for files," he said. And the audio explanations were helpful, but "after a while I wanted to turn them off because they got annoying."

Rivers and Romine were less diplomatic. When asked what they thought of it, they both chimed in with an emphatic "*hated it.*"

"Having text balloons explaining what's going on, as well a voice, is too much," Romine said. "Either tell me or show me—don't do both. They're trying too hard."

The interfaces of the Acer, Packard Bell, and Digital PCs evoked less polarized opinions. Our testers either seemed not to notice them (though they found their way around easily) or said they liked them just fine.

Software: When Less Is More

Preinstalled software makes it easy to use a new PC right out of the box, a number of family members agreed. Otherwise, the quality of the software bundles divided those who like to play on their computers from those who simply want to be productive. Example: When asked why the Digital Starion was his least favorite PC, Rodarmor and Frank's 12-year-old son Casey had a simple reason: "I could only find one game on it," he explained.

Television director Bill Brugger would gladly exchange all the CD-ROM titles for a few choice applications. "The CDs aren't really that useful for me," Brugger said. "All the PCs seem to come with Microsoft Works, for instance, when I'd much rather have Microsoft Office."

Amy Kuschel begged to differ. "Bill is much more practical than I am in the way he uses a computer," she said. "But I like

The HP Pavilion 7050

having all this stuff to play with. For instance, if I had to go to Toledo on business, I could do a search in this program [the *Medio* magazine CD-ROM that comes with the Aspire] and get an idea of what it's like there."

By way of illustration, Kuschel performed the search and was rewarded with a satellite view of Toledo, Ohio. "Gee, that's helpful," Brugger said with a playful smirk. "That's what the CD-ROM hype is all about."

Multimedia and More

Multimedia bells and whistles are all well and good, but crisp, clear monitor displays are what our families valued most. Ross and Anna Lai, for instance, were lavish in their praise of the NEC Ready's MultiSync monitor for its bright, vivid colors.

The Acer America monitor, however, was the group's overall favorite. "The monitor's dark console makes what's on the screen even brighter," Anna said. "It's like a frame around the screen. The dark border makes the background less distracting. You can really concentrate on what's on the screen."

Few if any of the family members expressed interest in the speakerphone/answering machine/microphone capabilities built into these PCs. Several people remarked that they already had answering machines.

Likewise, the infrared remote controls on the NEC and Packard Bell impressed no one. When asked if he would consider using the remote unit on the Packard Bell, Casey Rodarmor picked it up, frowned at the confusing array of Chiclet-size buttons, then put it back down. "Maybe if I had time to figure out what all these buttons are, I might," he said. With all the games at his disposal on the Packard Bell, however, this seemed a low priority.

The Price Is Right

The six Pentium systems on display ranged in price from $2068 for the Micron P90 Home MPC to $2799 for the Acer America Aspire (133 MHz). (These are estimated street prices not including monitors. All these manufacturers offer complete lines of home systems with varying processor speeds.)

No one balked at the price tags; indeed, the bottom line was often not at the top of anyone's list of priorities. It isn't that they considered cost irrelevant; rather, it's what they could get for the money that mattered.

"We want a home PC that the children aren't afraid of," Ross Lai explained. "It should be fast, well built, able to grow with the family's needs, and economically feasible. I don't mind spending $3000 if the computer meets those requirements."

The Computers

HD, hard drive; CD, CD-ROM drive; SP, speaker phone; MP, microphone; AM, answering machine; RC, remote control. Prices do not include monitors.

NEC Ready 9522

P-100; 16MB of RAM; 1.6GB HD; SP; MP; AM; RC; 28.8-kbps modem; 3-year warranty (1 year on-site); $2499; 800/632-4636

Nothing flashy, this Best of Show winner is your basic PC, with solid performance, reliability, and an impressive clutch of software. Reader service no. 639

Micron P90 Home MPC

P-90; 16MB of RAM; 850MB HD; SP; MP; AM; 14.4-kbps modem; 1-year on-site warranty; $2068; 800/223-6571

This mail-order model is considered a nerd's delight, but two of our home testers chose it based on performance and reputation. Reader service no. 640

HP Pavilion 7050

P-100; 16MB of RAM; 1.2GB HD; 4X CD; SP; MP; AM; 14.4-kbps modem; 1-year on-site warranty; $2199; 800/724-6631

The curvy new design and stylized interface did not impress our testers. Good performance, excellent service and reliability. Reader service no. 641

Acer America Aspire 133 Minitower

P-133; 16MB of RAM; 1.6GB HD; 4X CD; SP, MP; AM; 28.8-kbps modem; 3-year warranty (1 year on-site); $2799; 800/733-2237

You can't miss the stylish look of this eye-catching offering. And it has a delicious selection of 50 software programs. The speakers are built into the monitor. Reader service no. 642

Digital Starion 920

P-75; 16MB of RAM; 1.2GB HD; 4X CD; SP; MP; AM; 14.4-kbps modem; 3-year warranty (1 year on-site); $2199; 800/216-8115

The sound is robust on this none-too-beautiful machine, which comes with JBL speakers. The software selection is more suited to the adult palate than that of a family with children. Reader service no. 643

Packard Bell Multimedia Pentium 75

P-75; 16 MB of RAM; 1.2GB HD; 4X CD; SP; MP; AM; RC; 14.4 kbps modem; 1-year on-site warranty; $2500; 800/733-5858

The longtime leader in home computers did not fare well with our testers, who were unimpressed by the company's service reputation. Reader service no. 644

IBM Aptiva

P-100; 16 MB of RAM; 1GB HD; 4X CD; SP; MP; AM; 28.8-kbps modem; 3-year warranty; $2574; 800/426-2968

Not included in our taste test. Comes with MPEG playback software, as well as remote diagnostic software for technical support.

For more information about all products in this table, circle reader service no. 905.

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AWD

Service, Please

At evening's end, we asked our families which computers they liked best—and least. Then we revealed the results of our performance and CD-ROM compatibility tests, as well as the service and reliability ratings for each of the computer company. We asked them if our results made them change their minds. In most cases the answer was a resounding "yes."

Initially, the Aspire was tops with the Lais and with Romine and Rivers, and it was also one of the favorites of Brugger and Kuschel and the Rodarmor-Frank family. But Acer America's service ranking of "poor" and reliability ranking of "fair," and the Aspire's less than scintillating performance, caused these families to reassess the machine's merits.

"Service and reliability are key for us," explained Romine. "In an office if your PC screws up, you can use another one. At home, you don't want to be left hanging."

For Anna Lai, the Aspire's lackluster performance (despite its 133-MHz chip, it was outperformed by some 100-MHz models) sealed its fate. "I want my computer to be as fast as it can be."

The Packard Bell had been the number-two choice of Brugger and Kuschel. They appreciated its affordable price, Navigator interface, and selection of CD-ROM titles. But it too fell from grace when Brugger and Kuschel learned that Packard Bell's service was ranked "worst" and that its reliability ranked "fair."

"We're *Consumer Reports* shoppers," Brugger said. "We research products before we buy, and this kind of information is ultimately what helps us make our decision."

And the Oscar Goes To...

So what were the most and least popular PCs, when all was said and done?

NEC's Ready 9522 received two votes for best PC (and none for worst). The Duforts singled it out for its outstanding graphics and multimedia support (the NEC ships with MPEG playback software, for instance), as well as its selection of software titles. The Lais applauded the NEC's display, streamlined design, and solid performance.

Although the Micron P90 Home MPC didn't dazzle many people, Micron's "best" service and reliability ranking, the system's freedom from CD-ROM incompatibilities,

The Acer America Aspire

and its generally impressive benchmarks ultimately garnered it two votes for best of show. "For the specs and the price, the Micron is a good deal," said Brugger. William Rodarmor agreed.

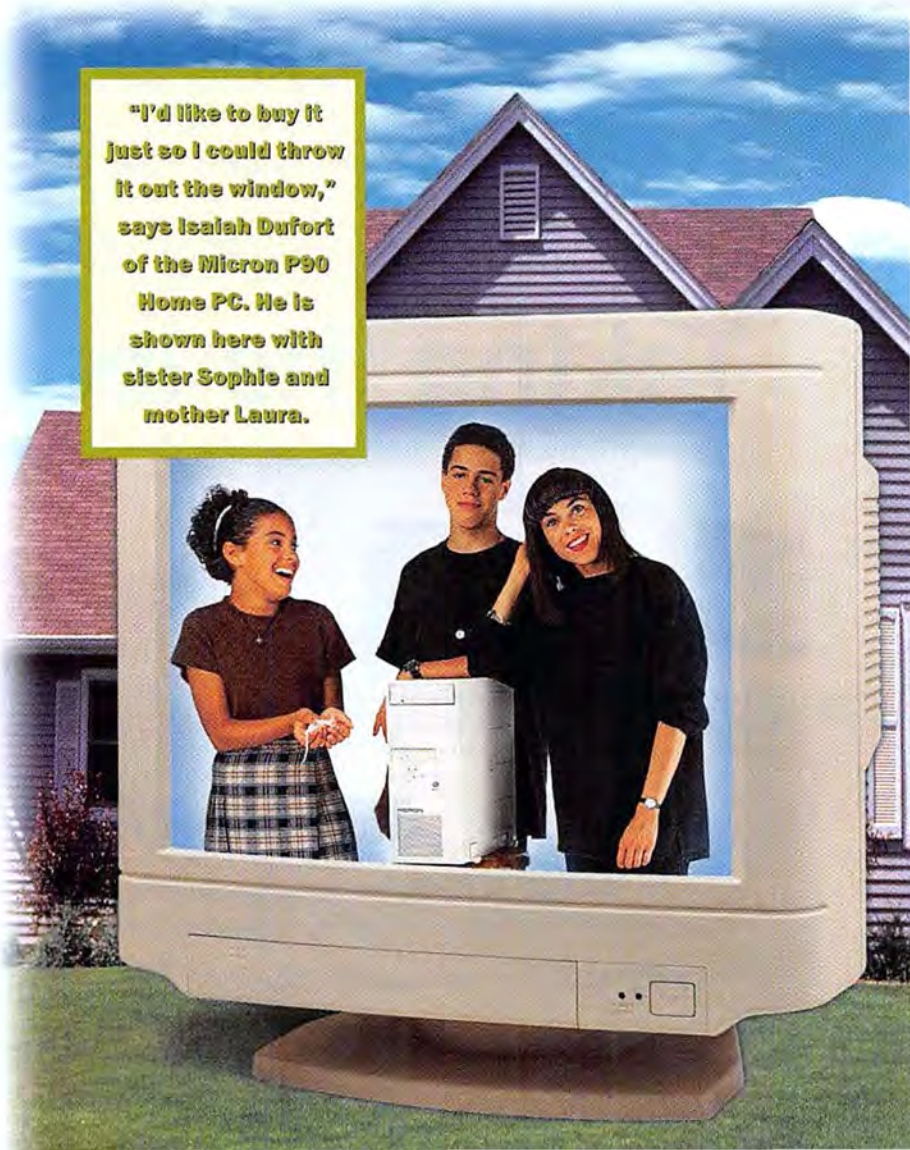
Isaiah Dufort, however, ranked the Micron dead last. "It was frustrating. It didn't help me get anywhere, and the system sounds were annoying and hard to cut off."

The Digital Starion was named best PC by Romine and Rivers. "It was easy to find our way around, and it has nice sound and multimedia," Romine observed. Interestingly, the Starion also was cited as the worst PC—by Brugger and Kuschel. The machine was "very unattractive," as Kuschel put it.

The HP Pavilion fared as unevenly as the Digital. While Brucia and her family sang its praises, Romine and Rivers cataloged its faults—among them its interface and puny speakers. The Brucias' least favorite PC was the Packard Bell, thanks to their less-than-positive experience setting it up.

Trash or Treasure? You Judge

Family feuds, performance benchmarks, and other considerations aside, here's the



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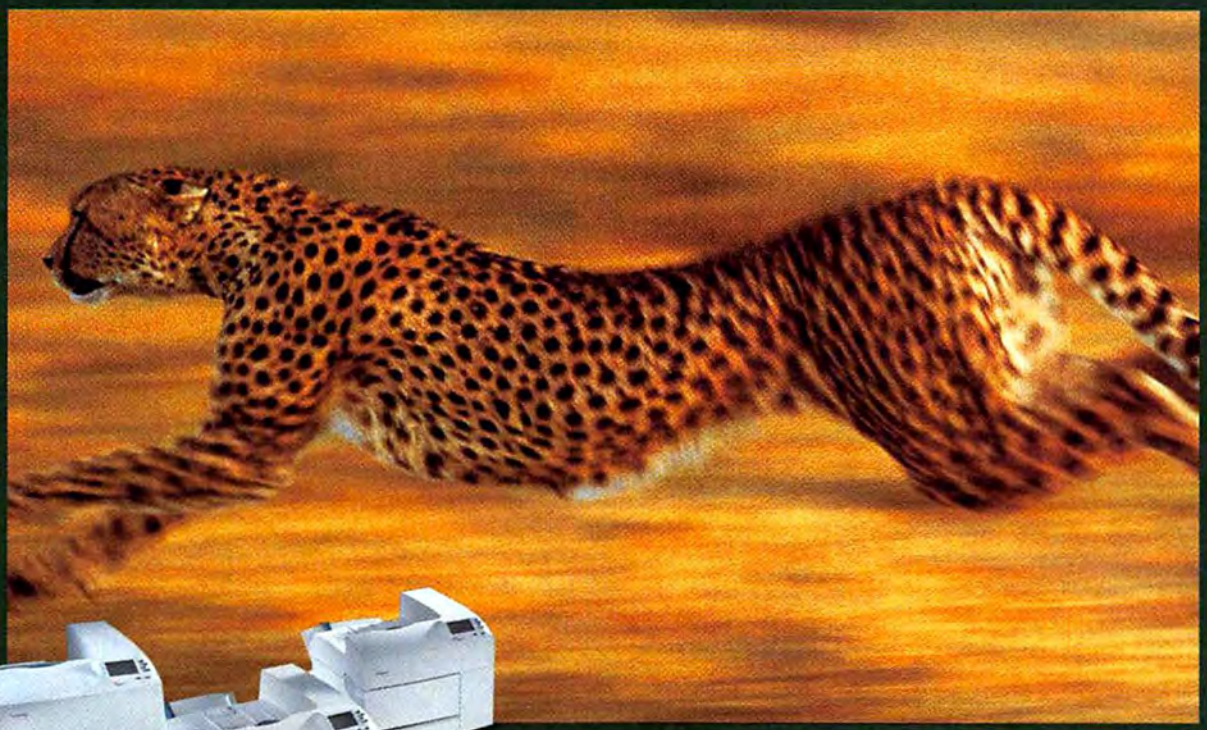

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bottom line: Choosing a home PC is a matter of taste, tempered with some trial and error, a good bit of research, and a dash of home economics.

Yes, looks do count, but when it comes time to lay the credit card on the table, strong performance and a good reputation mean more than aesthetics and the ability to communicate. That's not to say that these sleek new looks and friendly interfaces are a mistake. Had the Aspire's performance and service been on a par with its innovative design and mild-mannered interface, it would certainly have been voted best of this new breed. As it is, the vote for best of show goes to the NEC Ready 9522—even if it didn't make the best first impression.

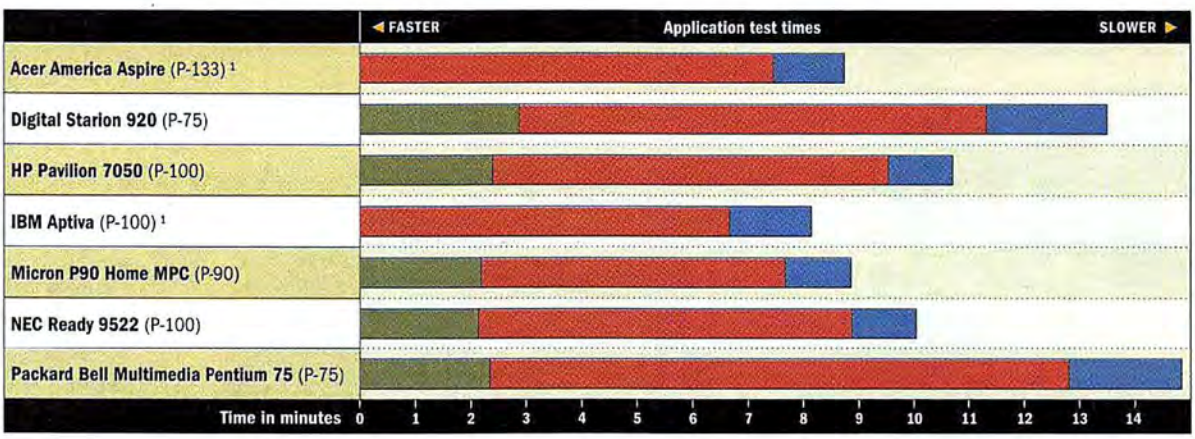
Of course, 11-year-old Sophie Dufort would disagree with the verdict of her fellow judges. At the end of our long night, Sophie was the only one still plucking away at a keyboard. The rest of her family was threatening to leave her behind, but Sophie just couldn't tear herself away from the Acer America Aspire.

"I like it," she said, smiling broadly. "It comes with good software. It was confusing at first, but once you get used to it, it's okay.

"And," she added, "it looks cool."

James A. Martin is a PC World *contributing editor. Assistant Editor Arden Hoffman contributed to this article.*

TEST REPORT Home PCs From Start-up to Finish Line



	CD-ROM incompatibility	Reliability	Service	Overall service and reliability	Setup and getting started
Acer America Aspire	Compton's Interactive Encyclopedia; Myst	fair	poor	fair	a snap
Digital Starion 920	Putt-Putt Saves the Zoo; Star Trek: A Final Unity	best	fair	good	takes time
HP Pavilion 7050	none	best	good	best	easy
IBM Aptiva	none	good	best	best	challenging
Micron P90 Home MPC	none	best	good	best	yikes!
NEC Ready 9522	Star Trek: A Final Unity	good	fair	good	challenging
Packard Bell Multimedia Pentium 75	none	fair	worst	poor	not too bad

[1] Unable to complete Astound test.

Methodology
Because these multimedia PCs are designed specifically for the home and come with Windows 95 preloaded, we used the Windows 95 benchmarks of our sibling publication, Multimedia World. They are not our usual benchmarks and do not correspond to those for the PC World Top 20.

Astound We created and manipulated slides, imported and edited media objects, applied templates and graphics filters, and displayed a completed presentation.

Microsoft Encarta 95 We tested time to load the program, Boolean searching, time-line scrolling, image loading, and video loading.

Microsoft Word for Windows 95 version 7.0 We performed searches and manipulated large amounts of text.

CD-ROM Incompatibility We installed each CD-ROM's program using standard procedures. Only if the title played correctly, with all functions performing properly, was it scored as compatible.

Setup and Getting Started On a scale of 0 to 100, a system earned points if it was easy to assemble (up to 20); had a "read me first" setup guide (up to 15); had color-coded labels (15) and labeled ports (15); included operating system documentation (5), hardware documentation (5), and software documentation (5); had a friendly user interface (10); and had Windows 95 preinstalled (10).

Service and Reliability Ratings are based on responses to our Service and Reliability Monitor. For details see "From Apple to Zeos: Rating Today's PCs."

Thanks to Multimedia World for the use of its multimedia benchmark and procedures.

Gateway 2000

Portable PCs

I needed out. My buddies in the programming lab were getting to me. So I tossed my Gateway Solo™ S120 Best Buy multimedia notebook into my pack and headed for the desert. Nothing like a little hot earth to clear the mind.

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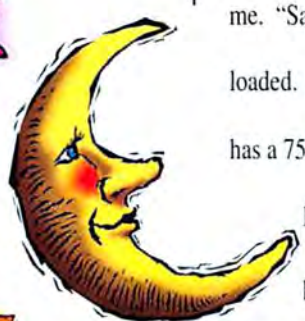

Perched on a rock, jamming to my favorite tunes (thanks to the 16-bit sound stereo speakers and CD-ROM drive), I watched the moon begin its journey across the night sky.

Off in the distance I saw headlights and heard the whining of an engine begging for a tune-up. Soon a battered old truck screeched to a halt in front of me. Over the dull roar of honky-tonk music I heard, "Need a lift buddy?" Sure, why not.

"My name's Ned. And this here's Chuck." He gestured to the armadillo curled up next to him. "I'm in 'crete." 'Crete? "Yea, lots of opportunity in concrete. Spend a lot of time on the road. But I like it that way. Say you got yourself a pretty nifty Gateway 2000® notebook. Me too. Wouldn't make a move without Sally here," Ned smiled as he patted the Gateway Solo V75 notebook sitting on the dash. Sally? "That's what I call her, after a certain waitress in Tucson," Ned winked at me. "Sally's loaded. She has a 75MHz Pentium processor, 8MB RAM, 540MB hard drive, and CD-ROM drive." He winked at me again.

Gateway Solo notebooks are optimized for Micros Windows® 95.

More c mor

Ned named his portable Sally.

"It has all the features I need while I'm on the road. Isn't that right Chuck?

EZ Pad™ pointing device for easy cursor navigation.

"I'm mighty fond of Gateway 2000. Best values in portable PCs around," smiled Ned. "And their portable line has something for everyone."

The radio droned on as Ned, Chuck and I continued on our trek through the dark desert. Armadillos like to have their heads rubbed. At least Chuck did. Up ahead I saw the neon sign of a roadhouse — a beacon in the darkness.

"I could use some grub. How 'bout you?" asked Ned as he pulled the truck into the dirt parking lot.

There she stood in all her glory. Tiara and satin dress shimmering beneath the fluorescent lights. "Next tour's in 15 minutes, honey," she said. Tour? "My name's Delilah, and I give the best moonlit desert tours in the West. Is that a Gateway Solo notebook?" she asked eyeing my portable.

nputing, laces.

Gateway Solo models feature two integrated stereo speakers.

"I have a Gateway Liberty small notebook. It's packed with fabulous features like a 540MB removable hard drive, and it weighs a mere 4.2 pounds! Why, this glorious PC has won nearly as many awards as I have! And the best part," Delilah leaned in closer. "Its huge 10.4-inch color screen is dual-scan for extra privacy." I suppressed the urge to ask the Desert Queen about the secrets she was keeping from the world.

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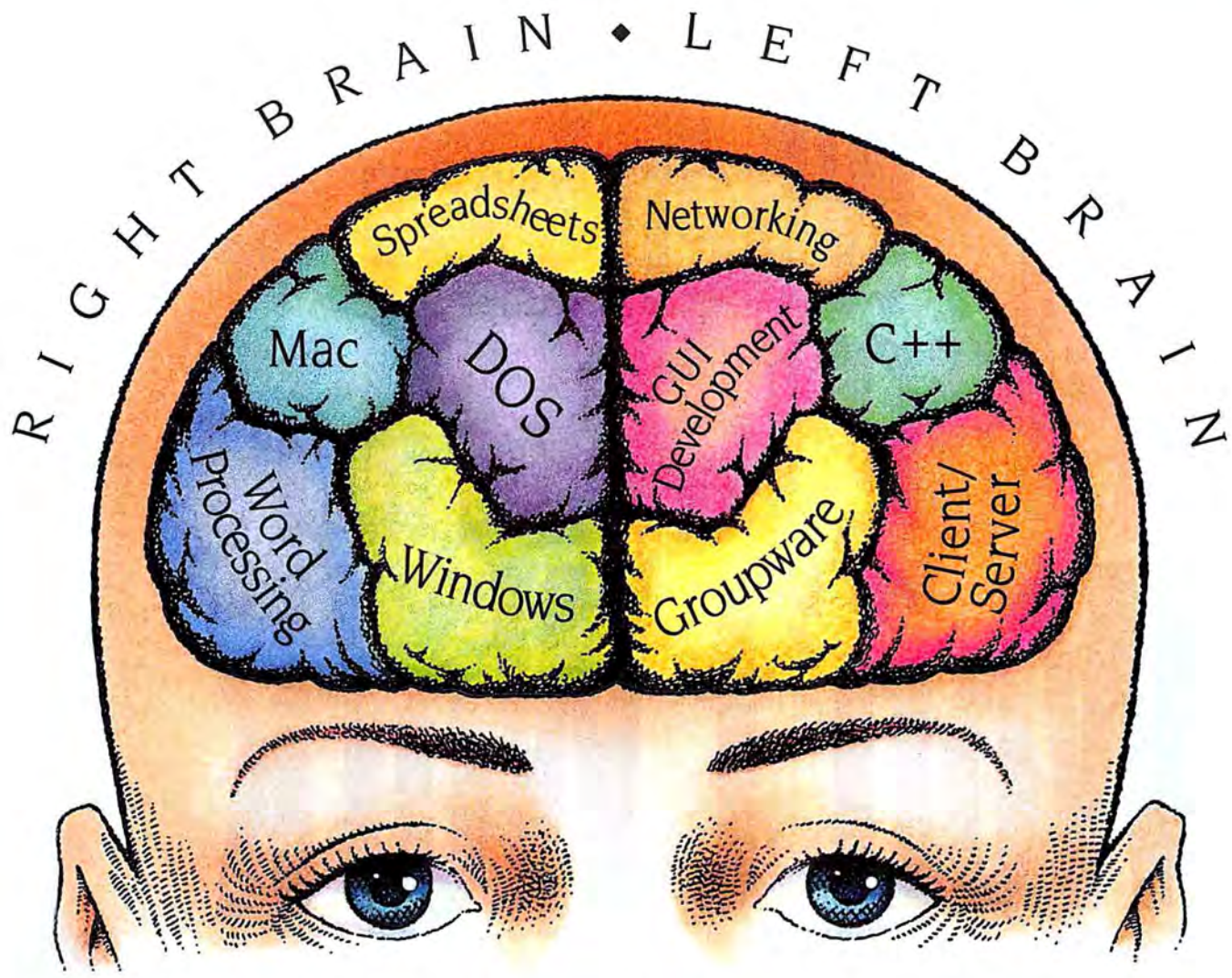

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Circle 97 on reader service card

Troubleshooting tips

When Plug and Play Won't Work

By Kirk Steers

Why can't a PC be more like a Mac? That was what Microsoft heard repeated like a mantra when the company asked users what they wanted in the next version of Windows. Make it easy to use, the PC-users said, and make installing hardware hassle-free—like a Macintosh.

Windows 95's Plug and Play specification is the company's response. It works well with Microsoft-okayed Plug and Play add-ons. But like any concept raised high on the pedestal of hype, there are bound to be problems. True, Microsoft went to great lengths to catalog the most frequently used hardware in existence before Windows 95's arrival and made sure that drivers for them were included with Windows 95. But let's face it: There was no earthly way for the company to provide drivers for *every* add-on device out there.

So where does that leave you when you try to plug in that old dot matrix printer, CD-ROM drive, or any other PC peripheral you have hanging around? While Windows 95 seems to offer no clues, there are indeed solutions buried in this behemoth of an operating system. But finding those solutions can drive you into such frustration that you'll want a therapist. Relax—it's okay. It's okay. *PC World* is here. What's on your mind?

MARK ZINGARELLI

DARN IT! WHY CAN'T A PC BE MORE LIKE A MAC?!

What kinds of Plug and Play problems might I expect?

Look for two main categories of problems: resource conflicts and device driver incompatibilities. Resource conflicts occur because add-in cards and peripherals are all vying for the CPU's limited supply of IRQs and DMAs.

An IRQ, or interrupt request line, is a dedicated link between a peripheral and the CPU. Most add-in cards now demand the exclusive use of at least one, and sometimes up to three, IRQs. And since the CPU has just 16 IRQs, half of which are reserved for motherboard devices, finding a free IRQ isn't always easy. What's worse, many finicky older cards will accept only specific IRQs that may already be taken by previously installed devices. The resulting conflicts can cause intermittent system lockups or even a full-blown system crash.

A DMA, or direct memory access channel, is a data expressway that connects a peripheral directly to memory. Compared to IRQs, DMAs are user-friendly. DMA conflicts are usually much more benign than those caused by IRQs—they most often cause slow performance instead of total system lockups. And because fewer cards need a DMA, these conflicts occur less frequently. Sound cards make the most extensive use of DMA channels.

Also expect hassles with some device drivers. For example, Windows 95 will load and accept an old driver for an 8-bit SCSI card for a CD-ROM drive, but that driver won't implement new Windows 95 features such as AutoPlay. If Windows 95 doesn't recognize your preexisting, or legacy, card (and hence can't load a Windows 95–compatible driver), you may have problems getting that card operating optimally or even at all. Windows 95 is not compatible with all Windows 3.1 drivers, and some card vendors have unfortunately been slow to introduce Windows 95 drivers for their legacy products.

Just What Is Plug and Play, Anyway?

Plug and Play is a set of hardware and software design specifications for the computer that when fully implemented should allow users to add new devices to their systems effortlessly. Literally plug them in, turn them on, and they begin working. A fully Plug and Play–compliant PC rests on a three-legged foundation: the computer's BIOS, the operating system, and the add-in cards or peripherals. To be fully compliant, each leg must satisfy Windows 95 Plug and Play design specifications. Plug and Play–compliant BIOSs and add-in cards have been available for well over a year. And now with the launch of Windows 95, the trinity is finally complete.

Any problems that do crop up will most likely be caused by the many noncompliant add-in cards that exist in systems when Windows 95 is first installed. Past testing at the PC World Test Center using a beta version of Windows 95 uncovered several difficulties with mixed groups of Plug and Play and legacy cards. Still, Windows 95 does an admirable job of identifying cards and—by using generic or substitute drivers—aiding in the installation of many noncompliant cards (80 to 90 percent of existing legacy cards, according to Microsoft).

One word of warning: Many vendors consider any PCI card to be a Plug and Play device. Not so. On hardware built to the PCI 2.0 spec (version 2.1 is current), Windows 95 and the Plug and Play BIOS can't always take control of IRQs assigned to the PCI bus. This creates an IRQ "blind spot" that opens the door for resource allocation conflicts. (For greater detail see the October *Hardware Q&A* column.)

Does Windows 95 at least provide me with some tools to troubleshoot?

Yes. Windows 95 has two particularly useful utilities for troubleshooting. The first is the *Device Manager*, a central switchboard that is truly a connection into Windows' soul. It can be used to load and unload devices, identify resource conflicts, and manipulate resource settings. To launch Device Manager, double-click the *System* icon in the Control Panel and then click the *Device Manager* tab at the top of the dialog box. You will see the hardware tree (a structure similar to that in the Explorer utility), which is a listing of the installed system devices currently recognized by Windows 95.

Second, there's the *Registry*. Appropriately, it sounds like a particularly nasty bureaucracy in a Kafka novel. If Device Manager is the switchboard, the Registry is the dark and labyrinthian back room of Windows 95, where all the hardware and software configuration data is stored. You shouldn't venture

Will My Hardware Work?

Yes. Microsoft has a Hardware Compatibility List of thousands of products that have passed Microsoft's initial set of basic Plug and Play compatibility tests. The HCL currently covers more than 2000 products and will be updated at least monthly. It will be distributed as a Windows help file (easily run from Windows 3.*x* and Windows 95) that displays a database of compatible products. Microsoft plans to distribute the file through the Microsoft Network, CompuServe, the World Wide Web, Microsoft Download Service, Gopher, and FTP.

When you open the HCL file by double-clicking it in Explorer, you see a line of icons representing different classes of peripherals. Select a class to open the database listing all qualifying products in the category that have passed basic compatibility testing. The last column, labeled TEST NOTES, can have three values, *Logo*, *N/A*, or *Compatible*, which correspond to different levels of testing. Logo is the only classification that guarantees true Plug and Play functionality. The other two merely show whether devices have entered or passed Microsoft testing. N/A means the product has passed compatibility testing for Windows 95, but has not yet been officially tested by Microsoft Compatibility Labs. Compatible means the product has passed further tests at MCL but has not yet been certified as an official Logo product.

there unless you have an intrepid guide to walk you through it.

Even though the Registry's interface seems friendly (it resembles Explorer and Device Manager), its actual structure is quite complex, and its organization is far from intuitive. Microsoft says that outside of programmers' development materials there is no complete, publicly available reference documentation for this feature. About the only time you will want to use the Registry is when technical support personnel are directing you step-by-step.

How do I know I have a problem?

The most obvious symptom, of course, is when your computer locks up as you try to run a peripheral—or when it doesn't respond to the device you are trying to use.

During either the initial installation of Windows 95 or the subsequent installation of a single add-in device using the Add New Hardware utility, Windows 95 will scan your computer and try to identify the card or peripheral and its resource requirements, then locate an appropriate driver from the Windows 95 database. If Windows 95 detects a resource conflict, it will notify you and offer to start the *Conflict Troubleshooter*. The Troubleshooter is an interactive Windows Help file that takes you to Device Manager and walks you through the process of identifying and resolving a particular conflict.

Even if installation completes with no sign of trouble, you should still confirm that all is well. Open Device Manager and click the plus sign next to a device class icon on the hardware tree. A list of all the relevant components for that type of device will appear. If there is a problem, Device Manager displays one of two warning flag types. The first is a yellow circle with an exclamation point. Just double-click the offending entry, click the Resources tab, and make note of the information given in the Conflicts box at the bottom of the Properties dialog box.

The second warning flag is a red X, which indicates that the device is not working: Either the BIOS (basic input/output system) reports the device as disabled by hardware (a jumper or switch, say), or a user has manually disabled it in Device Manager. It's disabled if the 'Current' box at the bottom of the General tab is unchecked.

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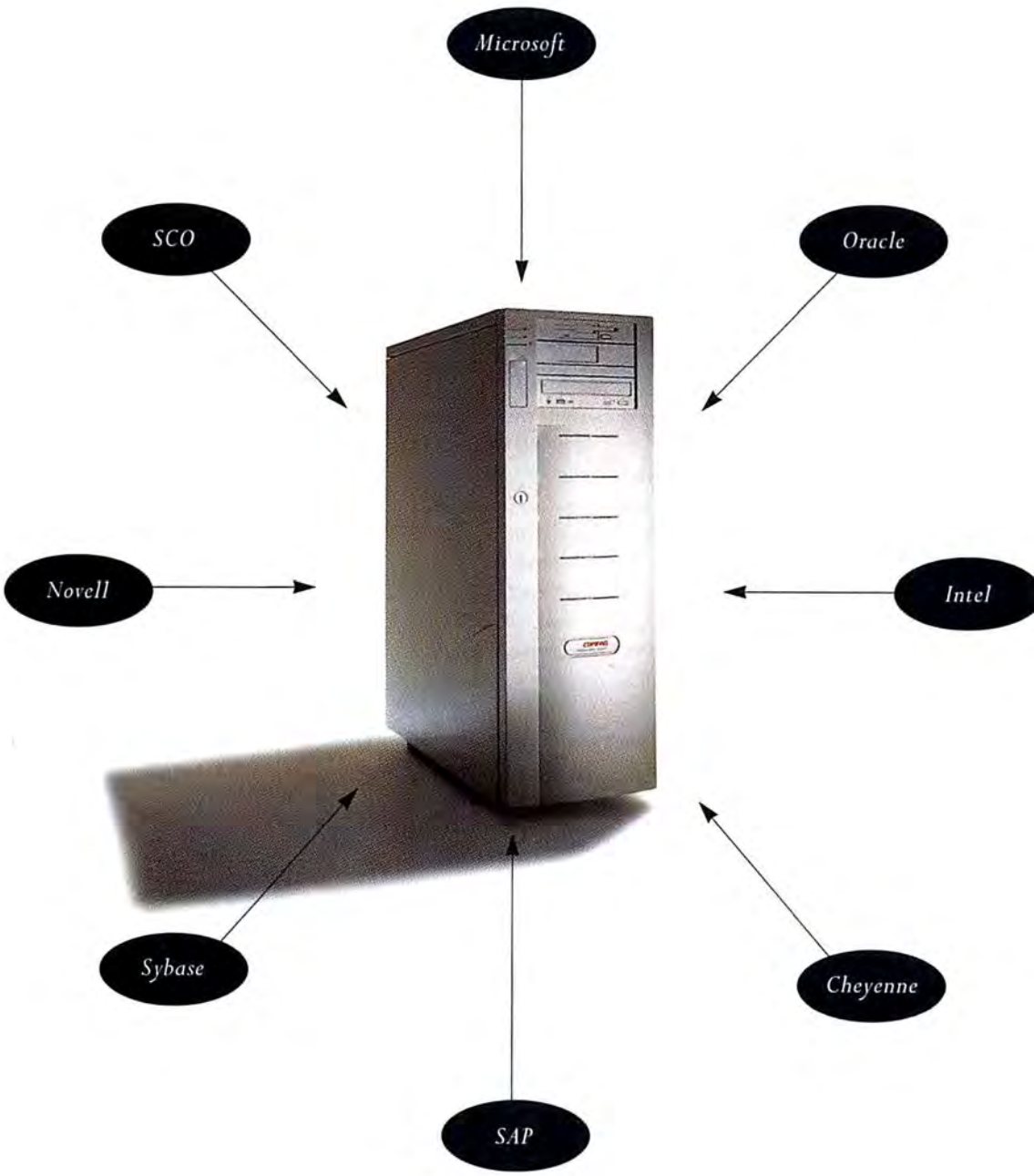

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Has It Changed Your Life Yet?

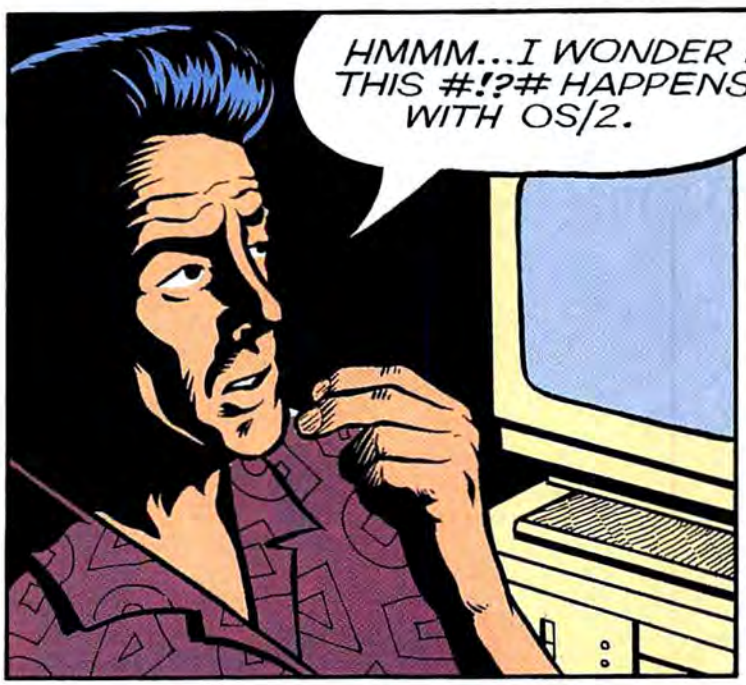
Circle 61 on reader service card

What does it mean when Windows 95 announces that it is starting in "Safe Mode"?

Safe Mode is a very stripped-down, anorexic version of Windows 95 that bypasses the start-up files and loads only the most basic drivers that are needed to get the operating system up and running.

If Windows 95 launches in Safe Mode, it has detected a problem that prevents it from running properly. For example, if you were to manually load a video driver that turned out to be incompatible with the installed video card, Windows 95 would recognize the mismatch and load a generic VGA driver in Safe Mode.

Once in Safe Mode, it's up to the user to go into Device Manager and correct the problem. You can manually start up in Safe Mode by pressing <F5> when the 'Starting Windows 95' message appears during the boot-up sequence.



What if I couldn't fix my Plug and Play problem with Device Manager?

If working with Device Manager in Safe Mode doesn't get you going, then there's a chance you've irreparably (albeit inadvertently) altered the Registry. For example, you could do this by incorrectly exiting Windows 95—either because of a crash or by pressing <Ctrl>-<Alt>-<Delete>—and bypassing the proper Shut Down sequence. Win 95 updates various system status information only on Shut Down, as selected from the Start menu. Fortunately, Windows 95 keeps a copy of the last working version of the Registry for occasions like this.

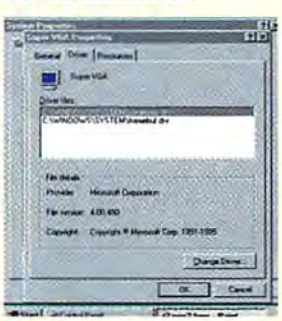
To save the day—and retain your sanity—simply enter what's called 'Safe mode command prompt only': Press <F8> when the 'Starting Windows 95' message appears, and select choice 7 from the boot menu. Then go to the Windows directory (**cd\windows** should get you there). To copy the backup files over the current Registry files, enter the command **attrib -s -r -h *.da?**, then **copy *.da0 *.dat** (answering **a** to the overwrite prompt), and finally, **attrib +s +r +h *.da?**.

Reboot, and voilà, you're back in business. But beware: Reloading the Registry

Drivers' ED.

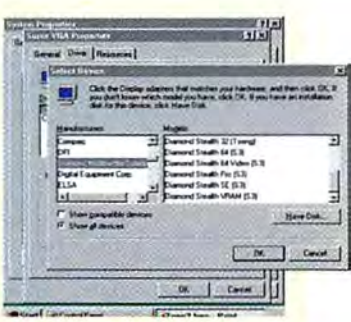
It really isn't too hard to install a device driver in Windows 95. Class is now in session...

1. When Windows 95 doesn't recognize a peripheral during installation or doesn't have the correct driver in its database, you'll need to install a driver manually. To illustrate, let's replace the generic Windows 95 Super VGA display driver with one specific to the installed display card, a Diamond Multimedia Stealth 64 graphics card. First, double-click the *System* icon in the Control Panel to access the System Properties dialog box.



2. Click the *Device Manager* tab and double-click the *Display adapters* icon to reveal the installed Windows 95 display driver, Super VGA. Select the Super VGA driver and click *Properties* to bring up its Properties dialog box.

3. Select the *Driver* tab to see the currently installed driver files. To change the driver, click—you guessed it—the *Change Driver* button at the bottom right of the dialog box. You then see the Select Device dialog box.



4. Here you have a choice. If you have a disk with a Windows 95 driver, insert it, click the *Have Disk* button at the lower right, and follow the screen directions. If you don't have a disk, Windows lets you manually select a driver from its own database. In this case, we would select *Diamond Stealth 64* from the list box.

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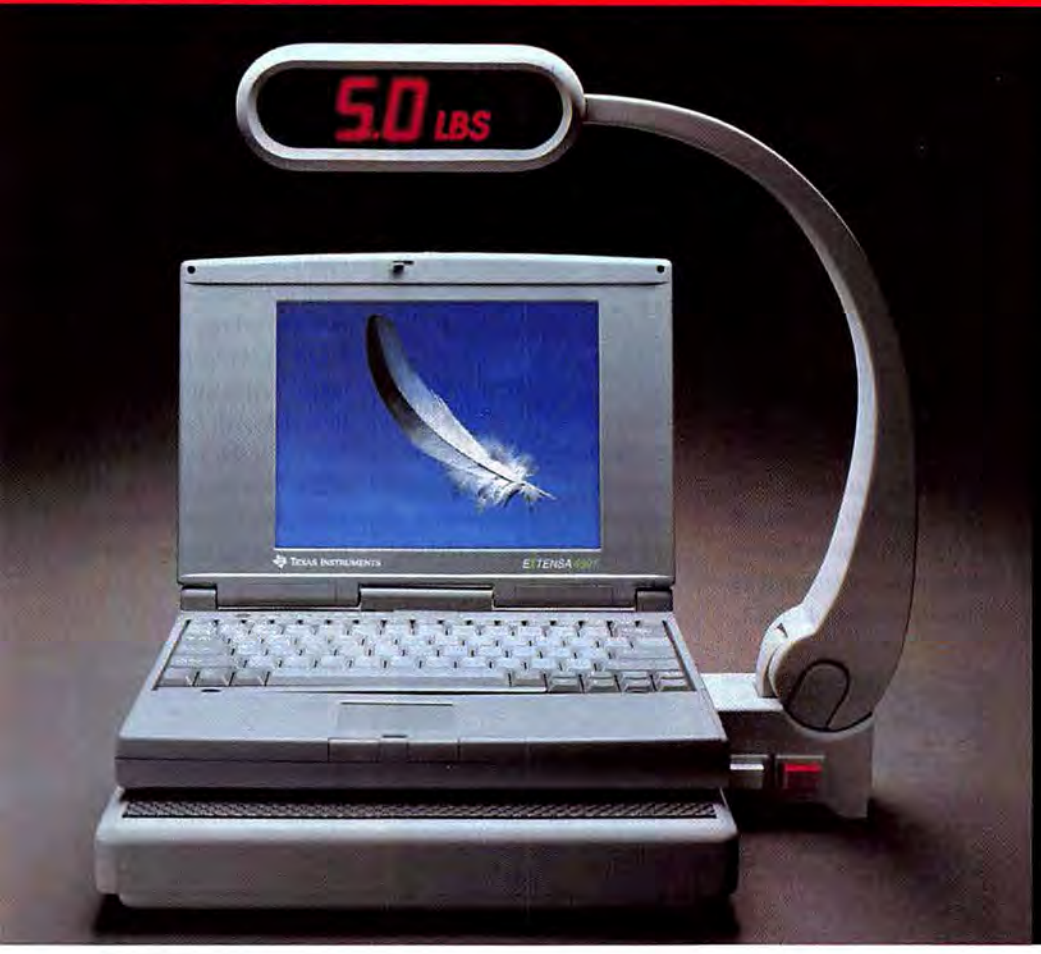

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Circle 244 on reader service card

TRAFFIC COURT

Some legacy cards have a limited number of acceptable IRQ and DMA settings. Even if Windows 95 recognizes the device being installed, it might not be able to successfully assign resources. In that case, you'll probably see a yellow warning flag in Device Manager. But no need to panic: Windows has a Conflict Troubleshooter in Help (under 'Hardware Conflict Troubleshooter' in the Help Index) that's a comforting companion to even the greenest of Windows 95 users. Here, we will resolve an IRQ conflict encountered during a Sound Blaster 16 card installation.

1. To examine the current resources configuration, double-click the *Computer* icon at the top of the Device Manager's hardware tree. This opens the Computer Properties dialog box, with the View Resources tab already selected and the Interrupt Request radio button already chosen. Scroll through the list box to see that IRQ 9 is not being used. (Note that IRQ 5 is reserved.) You could also examine other resources at this point, but since we know we are looking for an IRQ, let's move on. Notice the yellow flag when you go to Device Manager.

2. Device Manager's error flags: The yellow circle warns you of an IRQ sharing conflict, and the red X denotes that the controller has been disabled.

3. Yellow is not mellow. After running the Install New Hardware utility, the Sound Blaster 16 seems to have a problem. So double-click the warning flag to bring up this device's Properties dialog box.

4. The Device status box reports that there's a resource conflict. Accordingly, choose the *Resources* tab to investigate further.

5. The Resource settings message notes that the Sound Blaster is using no resources. This suggests that Windows was unable to find a suitable IRQ setting. Click the *Set Configuration Manually* button and try to find a usable IRQ.

6. Notice that the Sound Blaster is *trying* to use IRQ 5. But IRQ 5 has been reserved by the system to be used with another legacy card. You have two alternatives: Release IRQ 5 and reconfigure the other legacy device with a different IRQ, or search for a free IRQ and see if the Sound Blaster will accept that setting. If it works, then choose the latter by clicking the *Change Setting* button.

7. In the Edit Interrupt Request dialog box, select *09* as the IRQ Value (remember, IRQ 9 was available in step 1). Selecting it leaves the Conflict information box empty. Then click *OK*, and reboot. You should hear sounds now.

will not alter config.sys or autoexec.bat.

Accordingly, if you're loading any Windows 3.1 drivers through config.sys and one of *those* drivers is the source of the conflict, you'll have to use a text editor or Windows SysEdit to remove the driver from those old DOS files manually. To do this, simply type **rem** in front of the line that references the offending driver.

Windows 95 has loaded a chip-specific driver for my add-in card. Does that mean I need to manually load the Windows 3.1 driver that shipped with my card as well?

No. Windows 95 may not have a driver available for your add-in card and may instead load a generic driver written for a *chip* on the card. For example, if Windows 95 detects a Diamond Stealth 64 graphics card, it will load a driver written for the S3 graphics processor—the chip that drives the Stealth. The S3 driver will deliver acceptable performance. Even better, of course, is a driver written for the actual device, not just for the chip. Check to see if a more specific driver is available before settling for the generic one.

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intel inside pentium processor

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Circle 244 on reader service card

How Can I Get a Plug and Play BIOS?

The best way to identify your BIOS is to turn on your computer and watch the top of the screen for an announcement of the BIOS version. Often this will include the label "Plug and Play." If the BIOS version doesn't flash on screen, you can find complete version information using the Microsoft Diagnostics utility (type msd at the DOS prompt and select *Computer*).

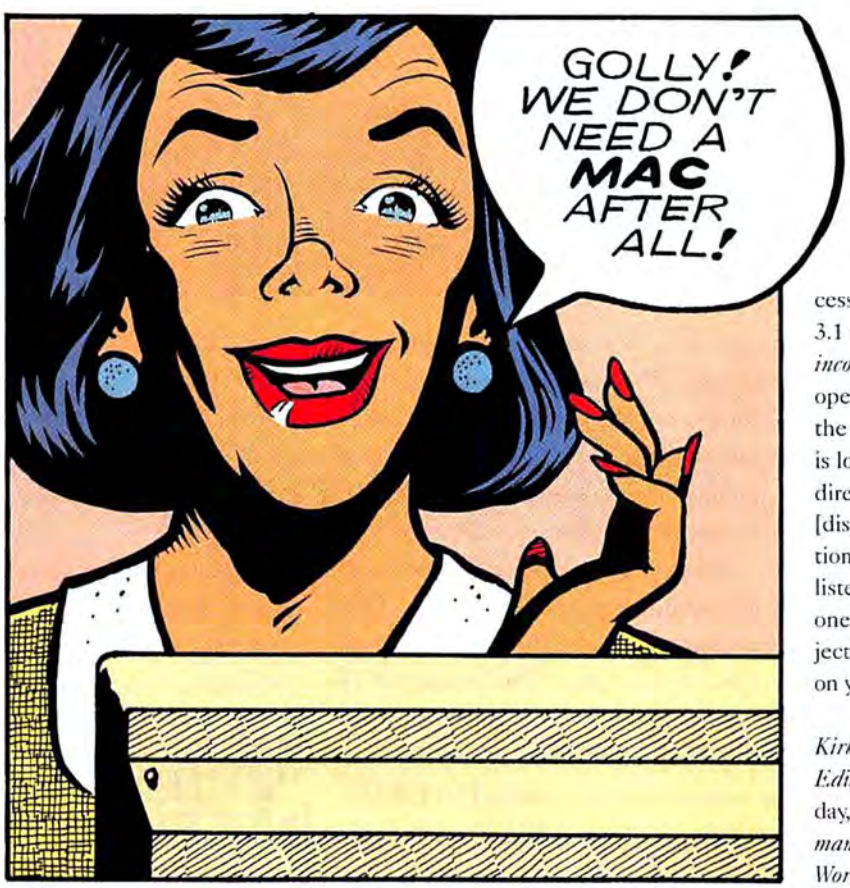
Even if your BIOS isn't Plug and Play compliant, you may still be able to upgrade it on the spot by downloading an update from the BIOS vendor's bulletin board or online service. Typically there's no charge, and installation is usually fairly easy. If you are lucky enough to have a reprogrammable *flash* BIOS chip on your PC's motherboard, it's just a matter of running a simple installation program from disk. The best way to ascertain whether you have a flash BIOS is to check with your system vendor.

If you don't have a flash BIOS, and your ROM BIOS chip is not hardwired to your motherboard, you *still* might be able to swap out the old ROM BIOS chip for a Plug and Play upgrade. This installation is a roll-up-your-sleeves affair that requires opening the case to replace the actual ROM chip: It's probably best left to a trained technician.

How do I find a Windows 95 driver for my add-on devices if Windows 95 doesn't have one?

If you've already tried the Add New Hardware utility and found nothing, then you'll have to look elsewhere. First check out Microsoft's Hardware Compatibility List (see "Will My Hardware Work?") for driver name, location, and version. Microsoft has made a serious commitment to making Windows 95 drivers both available and accessible. If all else fails, call your card vendor and ask for an updated driver. Another, perhaps quicker, alternative is to check the vendor's forum on a commercial bulletin board such as CompuServe or America Online and see whether the Windows 95 driver for your device is available for downloading.

To speed up your online file search, it's a good idea to call the vendor first to ascertain the exact name of the driver file you'll need to download. Then you can use the Find File command available on each online service to seek it out for you.



If I still don't find a working driver, what then? Are there any other solutions?

Sorry, you'll have to try a Windows 3.*x* driver. The easiest way to load a 3.1 driver is to install Windows 95 over Windows 3.*x* with the 3.*x* driver already installed. Windows 95 will automatically write the proper commands in the DOS and Windows configuration files. If you're installing 3.1 drivers and Windows 95 is already installed, then your best bet is to install the drivers from the DOS prompt.

That brings up another reality about Windows 95: *DOS is not dead*, it's merely buried in its own special corner of Windows 95. And those old friends autoexec.bat and config.sys (as well as win.ini and system.ini) still maintain a shadowy presence in order to ensure compatibility with applications that just can't let go of the past.

But anyone with legacy cards that require Windows 3.1 drivers may still have to make changes the old-fashioned way—by editing DOS files with any text editor. Fortunately, these files should be located in the same directories as under Windows 3.*x*. PC World Test Center experience has shown that when loading 3.1 drivers, editing config.sys in 'Command prompt only' mode is better than working in a DOS box in Windows 95.

You can also access a listing of Windows 3.1 video drivers that are *incompatible* with the new operating system. Open the msdisp.inf file, which is located in the Windows directory, and check the [display.update.force] section. The drivers that are listed in this area are the ones that Windows 95 rejected during installation on your system.

Kirk Steers is Multimedia Editor of CD-ROM Today, *and a former performance analyst in the PC World Test Center.*

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intel inside pentium PROCESSOR

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Fast budget Pentiums, such as the Best Buys shown here, will make Windows 95 a pleasure to use. From top to bottom: the Micron P90 Home MPC, DTK Quin-35M/P75, Gateway 2000 P5-100, and Dell Dimension P75t.

Want the oomph to run Windows 95 without the ouch of high prices? The latest budget Pentiums are your best bet. This month's chart toppers: Micron's P133 Millennia, Dell's Dimension P75t, Toshiba's Portégé 610CT, and Dell's Latitude LX 4100D.

Affordable Pentiums for Windows 95

By Rex Farrance and Melissa Riofrio

Windows 95 will be the last straw for the 486. Just as 386 PCs struggled with the demands of Windows 3.1 applications, 486s have to strain to handle some tasks in Windows 95. These aging workhorses slow to a crawl when loading programs, executing sorts, and scrolling large worksheets. A memory upgrade may help: Systems with 16MB of RAM can run Windows 95 apps significantly faster than those with only 8MB. And if your system is new enough, you may be able to install a DX4 or Pentium OverDrive upgrade. But for most of us, remodeling an old 486 into a productive Windows 95 PC will just be a costly exercise in futility.

The fact is, plenty of people will be shopping for a new system to run Windows 95—and they'll be putting a lot of thought into what kind of system to buy. PCs that produce very good benchmarks on our current applications test

MARC SIMON

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suite should also perform well in Windows 95. (Our new benchmarks of Windows 95 applications will debut in March.)

Fortunately, buying Windows 95 doesn't necessarily mean you have to shell out for a high-priced PC. As prices fall, some Pentium-75s have become as affordable as 486DX2s were a year ago. And this month's Budget Desktops Top 20 is stocked with Pentiums fast enough to have graced our power chart earlier this year. The priciest PC on our Budget Desktops chart is a Best Buy that costs just $2499—a fast Pentium-100 from Gateway 2000.

Because some of the best new low-cost Pentiums fall into the $1700-to-$2500 price range, we've raised the ceiling on our Budget Desktops Top 20 from $2250 to $2500. And to allow for Windows 95's greater demands, we've increased the weighting for performance. As a result, the very last of the cheap 486s have fallen off the chart, although a few DX4s remain. However, 13 budget desktop machines are still priced under $2000—including our number one Best Buy, the $1679 Dell Dimension P75t. We review this new budget leader here, along with three other new systems that make our chart: A $1590 multimedia AmDX4-100 from Netis, a bare-bones Pentium-75 from Gateway 2000, and a Polywell PC that boasts the first AmDX4-120 processor that we've seen.

The Best of 1995

Prices on today's Top 20s are similar to those of a year ago. Only now you see P-133 power desktops instead of last year's P-90s; P-75, P-90, and P-100 budget desktops instead of DX2-66s and P-60s; and a selection of Pentium notebooks instead of a single DX4-100. Here, in alphabetical order, are 1995's best achievers:

Dell Dimension (P-75, P-90, P-100, P-120, and P-133). Dimensions were a smash hit, with 40 appearances and 32 Best Buys.

Dell OptiPlex (P-90, P-100, and P-133). OptiPlexes made 19 appearances, including two Best Buys. No month went by in 1995 without at least one of these models on our Power Desktops chart.

HP Vectra VL3 5/120. This month the HP fell off the chart, the first time since its June review that it slipped below number ten on the Power Desktops Top 20. On the way, it earned two Best Buys.

Micro Express MicroFlex (486DX2-66, Am486DX2-80, AmDX4-100, P-60, and P-90). Twenty-two appearances, eight Best Buys.

Micron 4100 Magnum. This budget DX4-100 desktop has been on our charts in a couple of versions for more than a year. The current multimedia system has been a Best Buy since August.

Micron Millennia (P-100, P-120, and P-133). The first P-120Millennia appeared on June's power chart. Since then, no Millennia has dipped below seventh; Millennias have earned ten Best Buys.

Micron P90 PowerStation. In two incarnations, this model has been on our charts for almost a year and a half.

Polywell Poly (Am486DX2-80, AmDX4-100, DX4-100, P-60, and P-66 models). Twenty-four appearances and four Best Buys.

Toshiba T4900CT. P-75 power note was an eight-time Best Buy.

WinBook XPC. The last of the red-hot monochrome DX2-50 notebooks had six Best Buys before it was discontinued in September.

Service and Reliability Make the Machine

Reliability and service are always important. This month we integrate a fresh batch of data faxed in from readers (see "From Apple to Zeos: Rating Today's PCs" in *Top of the News*). We broaden the service factors taken into account on our Top 20s to include customers' decisions on whether they would buy from the same company again based on service experience. Major service players like Dell stayed strong. Micron's much-improved reliability boosted some of its power systems to the top. Gateway 2000 improved, but mostly in the last couple of months; our ratings are based on six months of responses, so you won't see the change reflected fully in Gateway's scores. Former leader Compaq remains solid, although its rating slipped a bit because of an increase in problems reported.

New Pentiums On the Rise

The number of Pentium-133s continues to grow; these powerhouses claim half the slots on our Power Desktops chart (three of the P-133s reviewed this month appear on the Top 20). Pentium-120s—including one reviewed here—occupy another quarter of the chart, while P-100s and P-90s fill the last five positions.

Our power notebooks chart shows a lot of turnover: Half are new systems, reviewed this month. Fortunately—considering Windows 95's demands—notebook speed records keep toppling. Pentiums now drive half the power systems, and our new number one, the Toshiba Portégé 610CT, is a P-90 subnote.

The budget notes chart shows less change. Only one of the notebooks we review this month made our list: the MPC TouchNote, an $1899 bargain based on a Cx486DX2-66 processor.

Windows 95 provides many longed-for features (better memory, resource management, and multitasking; long file names), and it should come as no surprise that these advancements require better hardware. Many 486 users feel hampered doing demanding work with Windows 3.1 apps. Since most buyers of new PCs get Windows 95 by default, fast and economically priced systems like the Pentiums on our Top 20s should ease the pain of transition.

Rex Farrance is a senior associate editor and Melissa Riofrio an associate editor for PC World. *They can be reached on PC World Online (see page 12 for contact information).* PC World *staff members John Goddard, Brad Grimes, Eric Hellweg, Arden Hoffman, and Harry McCracken and freelance writer Jon L. Jacobi contributed to this article. Testing by Dave Casini, Ulrike Diehlmann, and Mike Salayko; research and support by Andrew Hawn and Julian Weatherby.*

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THE TOP 20

PC WORLD POWER DESKTOPS

1 **Micron P133 Millennia**
Ultrafast, with 6X CD-ROM drive.

		Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1	Micron P133 Millennia	5	5	Aug 95	87	119	75/68	$3599	Pentium-133	16	1624
2	Micron P120 Millennia	6	7	June 95	85	111	75/68	$2999	Pentium-120	16	1278
3	Dell Dimension XPS P133c	1	2	Nov 95	85	115	73/69	$3515	Pentium-133	16	1080
4	Micron P100 Millennia	7	5	Aug 95	85	107	75/68	$2899	Pentium-100	16	1278
5	Dell Dimension XPS P120c	2	4	Sep 95	84	111	73/69	$3699	Pentium-120	16	1080
6	Dell Dimension XPS P100c	3	5	Aug 95	84	100	73/69	$2742	Pentium-100	16	1083
7	Gateway 2000 P5-120XL	11	7	June 95	83	113	66/64	$3359	Pentium-120	16	1624
8	CompuAdd C133MHz	30	1	Oct 95	82	119	69/65[2]	$4152	Pentium-133	16	1624
9	Gateway 2000 P5-133XL	15	5	Aug 95	82	120	66/64	$3999	Pentium-133	16	1624
10	DTK Quin-54M/P133	–	1	current	81	111	73/68	$3390	Pentium-133	16	1080
11	Dell Dimension XPS P90	4	4	Sep 95	81	93	73/69	$2599	Pentium-90	8	1080
12	Austin PowerPlus 133	20	2	Nov 95	81	112	64/68[2]	$4199	Pentium-133	16	1625
13	Gateway 2000 P5-100XL	19	7	June 95	81	111	66/64	$3199	Pentium-100	16	1083
14	Tangent MediaStar 5133	10	2	Nov 95	81	126	[2]	$3295	Pentium-133	16	1080
15	Gateway 2000 P5-120	–	1	current	80	110	66/64	$2699	Pentium-120	16	1083
16	Everex Step Pro P133	18	2	Nov 95	80	117	63/69[2]	$3695	Pentium-133	16	1278
17	AST Bravo MS P/133	–	1	current	80	99	72/68	$2980	Pentium-133	16	1624
18	Austin PowerPlus 120	33	1	Sep 95	79	108	64/68[2]	$3999	Pentium-120	16	1083
19	Micron P90 Power Station	14	11	Feb 95	79	86	75/68	$2699	Pentium-90	16	1080
20	Dell OptiPlex XMT 5133	–	1	current	78	97	73/70	$4922	Pentium-133	16	1083

BEST BUY

[1] Call 800/434-4495 (for payment by Visa or MasterCard) or 900/903-2972 (for telephone billing) and use the fax reprint numbers listed above to order fax copies of system reviews. You can order three systems' capsule reviews ($4.95), a single capsule review plus features table and test report ($4.95), an entire month's review ($9.95), and a list of all systems tested by the PC World Test Center ($4.95). In addition, you can order next month's Top 20 charts and capsule reviews in advance (The Top 20 Flash

2 Micron P120 Millennia
Fast PC costs less than $3000.

3 Dell Dimension XPS P133c
Speedy and feature rich.

4 Micron P100 Millennia
Solid, quick business PC.

5 Dell Dimension XPS P120c
Fast and loaded.

CD-ROM drive	Bus slots	Monitor size/ dot pitch	Vendor contact number	Fax reprint number [1]	Reader service no.	Comments (Recommended as home system)
6X	ISA, PCI	15"/.28	800/223-6571	3268	805	Improved reliability, $700 price drop lift very fast P-133 with 6X CD-ROM drive.
4X	ISA, PCI	15"/.28	800/223-6571	3242	806	A $300 price drop makes this a great alternative to pricier P-133s.
4X	ISA, PCI	17"/.28	800/613-3355	3299	807	Quick P-133 is almost $400 cheaper than last month and has a fast fax-modem.
4X	ISA, PCI	15"/.28	800/223-6571	3267	808	Good price, great 100-MHz performance, solid configuration—a fine value.
4X	ISA, PCI	17"/.28	800/613-3355	3281	809	Fast performance, big monitor, and a very steady track record in service and reliability.
4X	ISA, PCI	17"/.28	800/613-3355	3265	810	Quick P-100 has a good price and excellent reliability and service; sound is a $99 option.
4X	ISA, PCI	17"/.25	800/846-2000	3244	811	Fast, great configuration, a CD changer, and a $200 price drop.
4X	ISA, PCI	15"/.28	800/627-1961	3307	812	CompuAdd's much-improved reliability puts very fast but pricey P-133 on chart.
4X	ISA, PCI	17"/.25	800/846-2000	3269	813	Superfast P-133 with CD changer is more than $300 cheaper than last month.
4X	ISA, PCI	17"/.26	800/289-2385	3306	814	High-quality components and a much higher company reliability rating.
4X	ISA, PCI	17"/.28	800/613-3355	3282	815	Very affordable, fast P-90 with big monitor is an attractive business machine.
6X	ISA, PCI	17"/.28	800/331-1501	3303	816	Down $300 since last month, but this fast, loaded system is still pricey.
4X	ISA, PCI	17"/.25	800/846-2000	3245	817	Superfast Pentium-100 has a multimedia configuration and a fax-modem.
4X	ISA, PCI	17"/.28	800/974-6658	3300	818	Fastest desktop we've seen, and at a very attractive price.
4X	ISA, PCI	15"/.28	800/846-2000	3309	819	Cheaper graphics subsystem than number seven, Gateway's P5-120XL: add sound for $99.
4X	ISA, PCI	17"/.28	800/821-0806	3302	822	Decent price for a speedy multimedia tower.
–	ISA, PCI	15"/.28	800/876-4278	3310	821	Only Top 20 power PC with no CD-ROM drive has fine reliability and good service policies.
4X	ISA, PCI	17"/.26	800/331-1501	3311	823	Price drop of nearly $200 helps well-configured P-120 with fast modem.
4X	ISA, PCI	15"/.28	800/223-6571	3184	820	Solid Pentium-90 with long run on list is still a solid value.
4X	ISA, PCI	17"/.28	800/613-3355	3312	824	Corporate PC is optimized for use in LAN environments, has Dell's best warranty.

Report, $9.95; available November 26). Touch-tone phone required. [2] We received fewer than 100 Reliability and Service Monitor responses for this company. Its ratings here are based on a combination of responses for it and for all companies for which we received 20 to 99 responses. (If we received fewer than 20 reliability or 20 service responses for a company, no score appears.)

For more information about all products in this table, circle reader service no. 911.

Top 20 Power Desktops

PRICES ARE PLUNGING IN THE POWER ARENA: The new number one P-133 Millennia dropped $700 since last month, and Micron reliability is way up. The number two P-120 Millennia is $300 cheaper this month, and Dell dropped the price on last month's number one, the Dimension XPS P-133c, by almost $400. We review four new Pentiums here. DTK's Quin 54M/P-133 benefits from the company's much-improved service and reliability rating. Gateway 2000's P5-120 is terrifically fast for a $2699 PC. AST's relatively slow Bravo MS P/133 is helped by the company's improved reliability rating. Dell's OptiPlex XMT5133, a reliable if slow P-133, is aimed at the corporate market.

1 Micron P133 Millennia

REVIEWED: August 1995

PROS: Fast system with huge hard disk, 6X CD-ROM drive

CONS: One-year warranty

A $700 drop in price plus a significant reliability gain in our fax-back survey elevate Micron's ultrafast $3599 minitower to the top. The supplied 15-inch monitor is nothing special, but you do get 16MB of EDO RAM, a 1624MB hard drive, all the multimedia trimmings, and a software bundle, including Microsoft Office 95.

2 Micron P120 Millennia

REVIEWED: June 1995

PROS: Fast, excellent expandability, spacious 1278MB hard drive

CONS: One-year warranty

This high-performance multimedia P-120's price just dropped $300, to $2999. It comes with 16MB of EDO RAM and a 1278MB hard drive. Micron's reliability is now excellent, although the company's one-year standard warranty is still minimal.

3 Dell Dimension XPS P133c

REVIEWED: November 1995

PROS: Fast performance, first-class components, fine reliability and service

CONS: On/off button looks too much like a floppy eject button

The price on this very fast system dropped $384 this month to $3515. Quality components include a Sound Blaster AWE32 wavetable sound card, a Number Nine 9FX Motion 771 full-motion video accelerator, and a U.S. Robotics 28.8-kbps V.34 fax-modem. Dell's service and reliability are among the best.

4 Micron P100 Millennia

REVIEWED: August 1995

PROS: Good price for a fast Pentium-100 PC with a 1278MB hard drive

CONS: One-year warranty

At $2899, this speedy multimedia business PC comes with 16MB of EDO RAM, a 1278MB hard drive, and a 15-inch monitor.

5 Dell Dimension XPS P120c

REVIEWED: September 1995

PROS: Great performance, multimedia, video-accelerated graphics card, 28.8-kbps fax-modem

CONS: On/off button can be mistaken for floppy eject button

The $3699 XPS P120c keeps pace with many P-133s, and it has a multimedia configuration, 16MB of RAM, a 17-inch monitor, full-motion video acceleration, and a 28.8-kbps modem.

6 Dell Dimension XPS P100c

REVIEWED: August 1995

PROS: Fast, $359 price drop this month, 17-inch monitor, full-motion video

CONS: On/off button can easily be mistaken for floppy eject button, lacks sound

7 Gateway 2000 P5-120XL

REVIEWED: June 1995

PROS: Fast, 1624MB hard drive, $200 price drop this month, 17-inch monitor

CONS: No guaranteed turnaround time for factory repairs

8 CompuAdd C133MHz

REVIEWED: October 1995

PROS: Improved reliability, top-notch performance, 24-hour tech support

CONS: No free SIMM sockets, one-year warranty, high price

9 Gateway 2000 P5-133XL

REVIEWED: August 1995

PROS: $330 price drop this month, 1624MB hard drive, 17-inch monitor

CONS: No set turnaround time for repairs

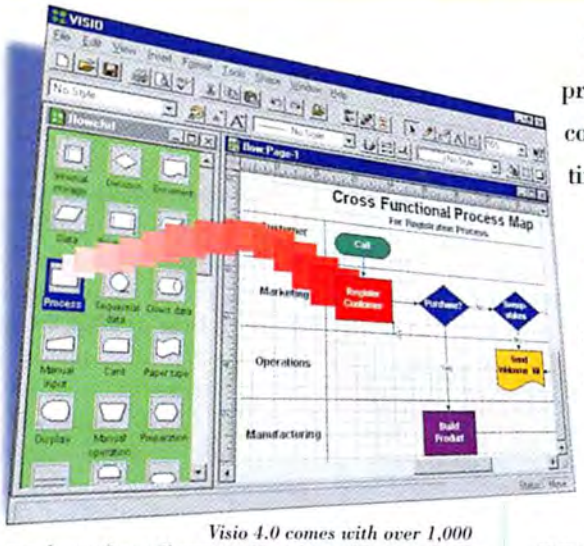
10 DTK Quin-54M/P133

NEW THIS MONTH

PROS: High-quality components, expandable, very good reliability

CONS: Documentation could be better, no weekend tech support

This Pentium-133 PC is priced reasonably at $3390 with 16MB of EDO RAM, 512K of secondary cache, a 1080MB hard drive, a Toshiba 4X CD-ROM drive, a Sound Blaster 16 board, and speakers. You also get a 2MB Diamond Stealth 64 VRAM graphics adapter and a 17-inch ADI MicroScan 5AP monitor.



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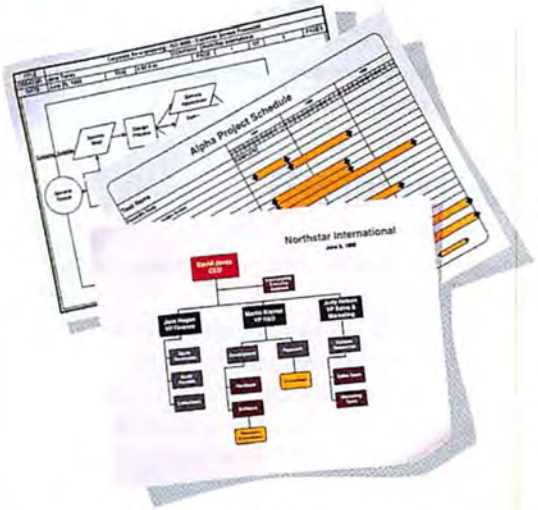

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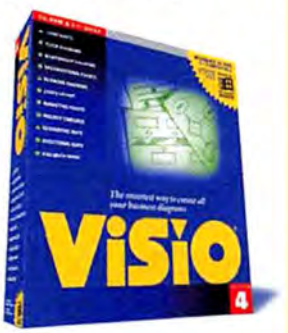

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Performance is solid, but it's mainly DTK's improved reliability and service rating—bolstered by a two-year warranty—that stands out. The rest of DTK's policies are less generous; tech support is available for 12 hours each weekday but not on weekends.

11 Dell Dimension XPS P90

REVIEWED: September 1995

PROS: Top performance for a Pentium-90, fine service and reliability, 17-inch monitor

CONS: Just 8MB of RAM, on/off switch looks like a floppy eject button

12 Austin PowerPlus 133

REVIEWED: November 1995

PROS: $300 price drop this month, 6X CD-ROM drive, excellent tech support policies

CONS: No free SIMM sockets, few free expansion slots, cable clutter, poor drive-bay accessibility

13 Gateway 2000 P5-100XL

REVIEWED: June 1995

PROS: Fastest Pentium-100 system we've tested, quad-speed CD-ROM drive

CONS: No free SIMM sockets, no set turnaround time for repairs

14 Tangent MediaStar 5133

REVIEWED: November 1995

PROS: Unmatched P-133 performance, amply configured, fine multimedia components

CONS: No applications bundled, only system software

15 Gateway 2000 P5-120

NEW THIS MONTH

PROS: Fine performance, reasonable price, 24-hour tech support, three-year parts warranty

CONS: No sound card or speakers

If you want a high-performance, no-frills power desktop with plenty of expandability and a low cost, this system should fill the bill. The $2699 P5-120 is a lower-price version of the deluxe P5-120XL tower in seventh place. This compact gives you great performance, but it has a smaller 1083MB hard drive and no sound. You get Microsoft's Office 95 suite and Bookshelf 95, but at this price, Gateway provides just a 15-inch 1572DG CrystalScan monitor and a 2MB ATI Mach 64 graphics adapter.

Gateway P5-120

You get a year of on-site service; Gateway's reliability and service have been improving, according to our fax-back tracking.

16 Everex Step Pro P133

REVIEWED: November 1995

PROS: Fine performance, integrated 16-bit sound

CONS: No weekend tech support, no free SIMM sockets

17 AST Bravo MS P/133

NEW THIS MONTH

PROS: Very good reliability and service, good price

CONS: Slow for a P-133, no CD-ROM drive, no speakers to go with the built-in 16-bit sound

This P-133 minitower has 16MB of RAM and a 1624MB hard drive, and it costs just $2980. But some perks are missing: It's the only PC on our Power Desktops chart that lacks a CD-ROM drive, and its performance is more comparable with that of a fast P-100.

AST

A 2MB PCI ATI Mach 64 graphics controller is built in, and AST provides a 15-inch Vision 5L monitor. Expandability is good on the Bravo. Inside, you'll find a riser card unusually oriented to hold the expansion slots facing down. So you have to flip the case over on its side to install or remove cards. Service and reliability ratings are fine, and you get a three-year warranty.

18 Austin PowerPlus 120

REVIEWED: September 1995

PROS: Fast and feature rich, good support policies

CONS: Review unit came without manuals for the system or the CD-ROM drive

19 Micron P90 Power Station

REVIEWED: February 1995

PROS: Fast Pentium-90 performance, good reliability and service scores

CONS: One-year warranty is minimal these days

20 Dell OptiPlex XMT 5133

NEW THIS MONTH

PROS: Network adapter and setup software, three-year warranty, excellent reliability

CONS: Pricey, quite slow for a Pentium-133

The expandable XMT 5133—like all OptiPlex PCs—is designed for trouble-free use in a networked environment. But it is one of the slower P-133s we've tested, and at $4922, it's not cheap. Nevertheless, its corporate focus and strong support make the XMT 5133, with 16MB of RAM and a 1083MB hard drive, a worthy contender.

This straitlaced business system also comes set up with multimedia components. The graphics system gets mixed reviews: The 17-inch Dell D1728-LS monitor is solid, but the integrated S3 Vision864 graphics chip is outdated. With 2MB of DRAM it still can handle most graphics tasks—but most of the chips we're seeing these days in high-end Pentiums offer better performance, as well as the ability to accelerate full-motion video.

Dell OptiPlex 5133

Dell's documentation is good, as always, and the company's reliability and service continue to earn solid marks from our readers.

The award winning original.

PC MAGAZINE EDITORS' CHOICE
November 22, 1994
Brother HL-630
Brother HL-630
November 22, 1994

TECHNICAL INNOVATION AWARDS
PC MAGAZINE 1994
January 1995

PC MAGAZINE
JANUARY 10TH ISSUE
BEST PRODUCTS OF 1994
"Offers more frills ...for the price"
January 10, 1995

CONSUMER GUIDE
What to Buy for Business
EDITOR'S CHOICE
Brother
Laser Printers
Model HL-630 & HL-660
1994 Edition: Volume 1994/Issue 10

ComputerLife
Votes
Brother HL-630 & HL-655M
Best Black & White
Laser Printers
December 1994

EDITOR'S CHOICE
January 1995

PC Computing
★★★★
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March 1995

PC WORLD
BEST BUY
February 1995

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THE PC WORLD TOP 20

BUDGET DESKTOPS

1 **Dell Dimension P75t**
Ultra-affordable Pentium.

		Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1	Dell Dimension P75t	–	1	current	85	75	73/69	$1679	Pentium-75	8	540
2	Micron 4100 Magnum	1	5	Aug 95	83	70	75/68	$1899	DX4-100	8	1278
3	DTK Quin-35M/P75	3	5	Aug 95	82	70	73/68	$1875	Pentium-75	8	1083
4	Micron P90 Home MPC	5	5	Aug 95	80	74	75/68	$2249	Pentium-90	8	850
5	Gateway 2000 P5-100	–	1	Nov 95	79	104	66/64	$2499	Pentium-100	16	1084
6	Austin PowerPlus 75	26	3	May 95	79	69	64/68[2]	$1939	Pentium-75	8	850
7	Polywell Poly 4120P8	–	1	current	79	73	[2]	$1895	AmDX4-120	8	1080
8	Gateway 2000 P5-75	–	1	current	78	67	66/64	$1739	Pentium-75	8	540
9	Vektron PCI P-75	2	6	July 95	78	74	61/59[2]	$1695	Pentium-75	8	852
10	Netis N4100	–	1	current	78	58	[2]	$1590	AmDX4-100	8	1278
11	HiQ Neptune PowerStation P100	–	1	July 95	78	89	[2]	$2237	Pentium-100	16	1083
12	HiQ Saturn Station	15	2	Nov 95	77	79	[2]	$1989	Pentium-75	16	1200
13	Micro Express MicroFlex-PCI/P902	10	3	Oct 95	77	86	63/61[2]	$2024	Pentium-90	8	540
14	Netis N5100	–	1	Oct 95	77	100	[2]	$2420	Pentium-100	16	1278
15	Polywell Poly DX4-100	4	3	Apr 95	77	69	[2]	$1798	DX4-100	8	540
16	Quantex QP5/75 M-1	11	4	Sep 95	77	65	60/63	$1799	Pentium-75	8	850
17	Netis N575	14	3	Oct 95	77	76	[2]	$2015	Pentium-75	16	1278
18	Intelesys Star 75	13	5	May 95	77	67	64/54[2]	$1799	Pentium-75	8	850
19	Quantex QP5/90 M-3	–	1	Mar 95	77	79	60/63	$2259	Pentium-90	16	1083
20	Compaq ProLinea 575	–	1	Sep 95	76	69	77/72	$1954	Pentium-75	8	425

BEST BUY

[1] Call 800/434-4495 (for payment by Visa or MasterCard) or 900/903-2972 (for telephone billing) and use the fax reprint numbers listed above to order fax copies of system reviews. You can order three systems' capsule reviews ($4.95), a single capsule review plus features table and test report ($4.95), an entire month's review ($9.95), and a list of all systems tested by the PC World Test Center ($4.95). In addition, you can order next month's Top 20 charts and capsule reviews in advance (The Top 20 Flash

2 **Micron 4100 Magnum**
Fast multimedia DX4-100.

3 **DTK Quin-35M/P75**
Tons of storage.

4 **Micron P-90 Home MPC**
Full-featured family Pentium.

5 **Gateway 2000 P5-100**
Pentium-100 on a budget.

CD-ROM drive	Bus slots	Monitor size/ dot pitch	Vendor contact number	Fax reprint number [1]	Reader service no.	Comments (Recommended as home system)
4X	ISA, PCI	15"/.28	800/613-3355	3313	825	New low-cost P-75 from reliable Dell. Sound costs $99 extra.
4X	ISA, PCI	15"/.28	800/223-6571	3273	826	Highest-rated budget DX4-100 is fast, well-priced, and does multimedia.
4X	ISA, PCI	15"/.28	800/289-2385	3274	827	Good P-75 performance, attractive price, fine reliability on tower unit.
4X	ISA, PCI	15"/.28	800/223-6571	3275	828	Comes with a full multimedia configuration.
4X	ISA, PCI	15"/.25	800/846-2000	3314	829	Ultrafast low-cost unit is our first budget P-100 Best Buy; sound costs $99 extra.
4X	ISA, PCI	15"/.28	800/331-1501	3315	830	Price drop of $200 since last month buoys this well-configured P-75.
4X	ISA, PCI	15"/.28	800/999-1278	3316	831	First AmDX4-120 PC we've reviewed combines high performance, low price.
4X	ISA, PCI	15"/.25	800/846-2000	3317	832	Bare-bones configuration has no secondary cache option, lacks sound.
–	ISA, PCI	15"/.28	800/725-0026	3257	835	Excellent price for a fast desktop, but no CD-ROM drive or sound.
4X	ISA, PCI	15"/.28	800/577-7526	3319	834	Slowest PC on the chart has the lowest price and a big hard drive.
4X	ISA, PCI	15"/.28	800/827-5836	3320	836	Budget P-100 has a great price, generous configuration, so-so performance.
–	ISA, PCI	15"/.28	800/827-5836	3304	838	Excellent P-75 performance at a good price, but no multimedia extras.
4X	ISA, PCI	15"/.28	800/989-9900	3295	837	Attractive price on quick Pentium-90 with small hard drive and no sound.
4X	ISA, PCI	15"/.28	800/577-7526	3321	839	Tower has hot performance, lots of RAM, a big hard drive, but no sound.
4X	ISA, PCI	15"/.28	800/999-1278	3297	841	Pentium competition lowers rank of multimedia PC with big CD-ROM bundle.
4X	ISA, PCI	15"/.28	800/896-4898	3284	842	Multimedia P-75 has high-quality CD-ROM drive.
–	ISA, PCI	15"/.28	800/577-7526	3296	843	Lots of RAM, generous hard drive, but no multimedia components on quick P-75.
4X	ISA, PCI	15"/.28	800/577-2486	3276	840	Multimedia tower with a fax-modem for less than $2000.
4X	ISA, PCI	17"/.26	800/896-4898	3200	844	A 14.4-kbps fax-modem and the only 17-inch monitor on chart, but no sound.
–	ISA, PCI	15"/.28	800/345-1518	3318	833	P-75 with stingy hard disk had $200-plus price drop since last month.

Report, $9.95; available November 26). Touch-tone phone required. [2] We received fewer than 100 Reliability and Service Monitor responses for this company. Its ratings here are based on a combination of responses for it and for all companies for which we received 20 to 99 responses. (If we received fewer than 20 reliability or 20 service responses for a company, no score appears.)

For more information about all products in this table, circle reader service no. 912.

Top 20 Budget Desktops

NOW MORE THAN EVER, INEXPENSIVE PENTIUMS tell the budget story. Four of our Best Buys use this powerful processor, including the best of the Pentium 100s—Gateway 2000's P5-100, a sterling performer and our first Pentium-100 Best Buy. The Dimension P75t, a $1679 Pentium-75, is our new number one budget model and the first we've reviewed of Dell's new low-cost line of Dimensions. Also notable is Polywell's new Poly 4120P8, the first AmDX4-120 we've seen; this unit puts Pentium-like performance into a $1895 minitower PC. Another newcomer is the bargain-priced Netis N4100, an AmDX4-100 system that costs just $1590 and has a large 1278MB hard drive. Gateway 2000's P5-75, also reviewed this month, costs a mere $1739 with no sound. The DX4-100 PCs are more sparsely represented than in the past: Only a couple are still on the chart, including Micron's excellent 4100 Magnum in second spot.

1 Dell Dimension P75t

NEW THIS MONTH

PROS: Low price, good performance, three-year parts warranty

CONS: On/off button poorly designed and inconveniently located, no sound features

Budget shoppers with champagne tastes will find the new Dell Dimension P75t irresistible. Fast, attractive, and well supported, it's a sure bet for business or home buyers. The P75t minitower we looked at cut some corners to keep the price at $1679, but it still makes quite a fine successor to the system it replaces—the venerable Dell XPS P-75, which enjoyed a six-month run on our Budget Desktops Top 20.

Dell Dimension P75t

Our test model came with just an entry-level 540MB hard drive, 8MB of EDO RAM, and no secondary cache. Many vendors are opting to omit secondary caches to cut costs, with the idea that fast new EDO RAM will compensate. Although this trade-off doesn't always result in good performance, this system posts particularly good scores for a P-75. And if you want to milk every last drop of power, you can add 256K of asynchronous cache for only $50 more, or 256K of the faster pipeline-burst cache for $75.

Our test system came with a Mitsumi quad-speed CD-ROM drive but no sound card or speakers (Dell can add a Sound Blaster 16 card and Altec Lansing ACS-5 speakers for $99 extra). The 15-inch monitor is the same solid D1528-LS model Dell bundled with the XPS line. Dell also cuts costs—and gives you another slot for add-in cards—by putting the S3 Trio64 graphics chip and 2MB of DRAM on the motherboard. On-board graphics systems can be limiting, however. For example, the highest refresh rate the P75t can achieve at 800 by 600 resolution is 72 Hz, while an add-in card with the same Trio64 chip can go as high as 100 Hz. And if you're interested in running full-motion video on this system, you'll have to disable the on-board chip and install a new video card, because the Trio64 doesn't have the features it takes to make video clips look good on a PC.

Because it's a fairly basic machine with on-board components, the P75t gives you room to grow. It has three open drive bays (two externally accessible), three PCI slots, two ISA slots, and one slot that can take either an ISA or a PCI card. In addition, two SIMM sockets are available for upgrading RAM.

Dell not only promises to provide fine service and reliability—it really delivers the goods, according to a high volume of reader responses to our latest fax-back survey. The Dimension P75t warranty covers the system's parts for three years and all labor charges for one year. In addition, you get round-the clock technical support, along with a year of free on-site service.

2 Micron 4100 Magnum

REVIEWED: August 1995

PROS: Very fast for its class, 1278MB hard drive, solid multimedia configuration

CONS: One-year warranty, 32MB RAM limit

The price has bobbed up and down some, but the 4100 Magnum remains a solid buy. For $1899, you get a DX4-100 desktop that keeps up with many Pentium-75 systems and is backed by a company whose reliability rating continues to soar.

3 DTK Quin-35M/P75

REVIEWED: August 1995

PROS: 1083MB hard drive, solid Pentium-75 performance, good price

CONS: Cluttered motherboard, no money-back guarantee (system replacement only)

Yesterday's power configuration belongs to today's budget system. You get good P-75 performance from this $1875 DTK; you also get a 1083MB hard disk, a 2MB PCI graphics controller, and a CD-ROM drive. However, the motherboard is cluttered with cables, hindering access to the two free PCI slots.

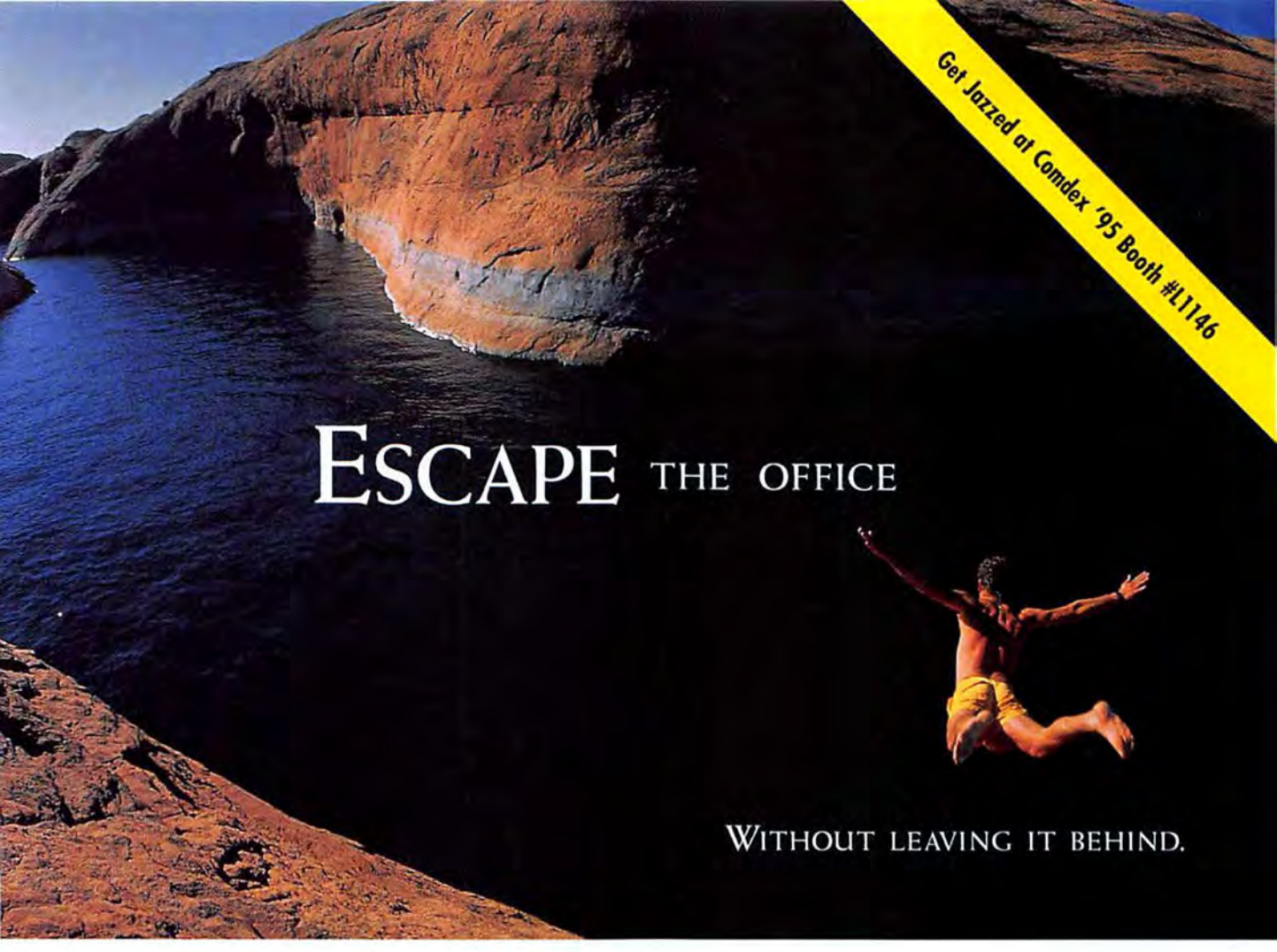
4 Micron P90 Home MPC

REVIEWED: August 1995

PROS: Great price for a fast budget PC with a multimedia configuration

CONS: One-year warranty

This $2249 system still comes with only 8MB of RAM, but Micron increased the standard hard drive size from 540MB to 850MB. The P90 Home MPC's exceptional performance and configura-



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tion, including a 2MB DRAM Diamond Stealth 64 graphics controller and a 14.4-kbps U.S. Robotics fax-modem, help keep it on our Best Buy list. Micron's consistently high rankings in our service and reliability survey sweeten the deal.

5 Gateway 2000 P5-100

REVIEWED: November 1995

PROS: Low price for a Pentium-100, good software, three-year warranty

CONS: Modestly configured except for 1084MB hard drive and 16MB of RAM

This fine-tuned version of Gateway's P5-100 desktop is faster than the model we saw in September, but not as fast as the souped-up P5-100XL we reviewed in June. The system comes with the Microsoft Office 95 software bundle; sound costs $99 extra. Considering the system's $215 price drop to $2499 this month, it's an excellent value.

6 Austin PowerPlus 75

REVIEWED: May 1995

PROS: Aggressive $1939 price for solid-performing P-75 multimedia PC, clear documentation

CONS: Sound card is 8-bit only

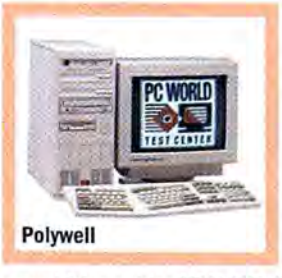
7 Polywell Poly 4120P8

NEW THIS MONTH

PROS: Good price, performance comparable to a Pentium-75's

CONS: Some cable clutter

Like many Polywell systems we've reviewed, the Poly 4120P8 is a high-value package. This is the first system we've seen built around an AMD DX4-120 processor, and it proves to have very snappy performance. In fact, many a Pentium-75 would be happy to claim the Polywell Poly 4120P8's benchmark scores. The system comes with 8MB of RAM, 256K of secondary cache, and a 1080MB Quantum Fireball Fast ATA hard drive. Even budget buyers tend to expect multimedia features these days, and this $1895 minitower doesn't disappoint: You get a quad-speed Matsushita IDE CD-ROM drive, a Creative Labs Vibra 16s sound card, and stereo speakers.



Polywell

Polywell includes an excellent graphics adapter—the 2MB VRAM Diamond Stealth 64. The inexpensive 15-inch Sampo AlphaScan KDM1566 monitor, with a 13.9-inch–diagonal viewable screen, is not one of our top-rated monitors, but it still supports an ergonomic 80-Hz refresh rate at 1024 by 768 resolution. Our test unit came with a Chicony ergonomic keyboard with the right- and left-hand keys separated and angled to make it easier to type with straight wrists. It's a good keyboard, but tastes vary, and Polywell has other models to offer—so try out a similar ergonomic keyboard before you order one.

The Poly 4120P8's case is generally well laid out. Four drive bays (three externally accessible) and one PCI, one PCI or ISA, and two ISA slots are all available for upgrades. The motherboard is accessible, and all the ISA slots accept a full-length card. Three SIMM sockets are also available for RAM upgrades. One minor complaint: The built-in Enhanced-IDE connectors' proximity to the SIMM sockets makes it difficult to insert a memory module in the last of the free sockets.

Polywell has one of the longest warranties in the business: Parts are covered for two years and labor for five. On-site service is available for $75 for the first year. In addition, you get 10 hours of tech support each weekday and 6 hours on Saturday. Despite many Polywell appearances on our Top 20s, we get relatively few responses about the company on our fax-back poll. The limited feedback is mostly positive, however. If you want a low-price system with good performance, a big hard drive, and a long warranty, the Poly 4120P8 bears close consideration.

8 Gateway 2000 P5-75

NEW THIS MONTH

PROS: Good price, improved documentation

CONS: No sound features or secondary cache

If you're shopping for a Pentium desktop from a leading vendor and your budget is pared to the bone, you may be interested in this configuration of Gateway 2000's P5-75. If you're willing to trade some performance for a lower price and your applications don't require sound, this compact machine is a solid value. Priced at $1739, it provides just the basics: 8MB of RAM, a minimal 540MB hard drive, and a modest software bundle including Microsoft Works 95. Although it comes with a CD-ROM drive, you'll have to shell out another $99 if you want a sound card and speakers. Gateway expects this system to get by on its fast EDO RAM without the help of secondary cache—a strategy that results in adequate but not outstanding performance.

Gateway P5-75

Expandability is decent, with four free drive bays (two externally accessible), one free PCI slot, three free ISA slots, and one free ISA or PCI slot. Two free SIMM sockets are available to upgrade RAM if you want to speed up Windows 95 applications.

Despite the P5-75's low price, Gateway does provide the surprisingly good 15-inch Gateway Vivitron monitor, which provides a clear, colorful, and vivid display. The STB PowerGraph 32 graphics adapter with 1MB of DRAM is an entry-level card, although it should suffice for most applications. However, if you hope to use high resolutions and lots of colors, bite the bullet and order the system with a graphics adapter that can accept more memory.

Recently we've had cause to criticize Gateway's documentation. Fortunately, both the manuals and online documentation have improved and are now more complete. Our only complaint: We received a manual for the wrong CD-ROM drive. Gateway's service and reliability have been on the upswing over the last couple of months (although our six-month compilation doesn't show that

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full improvement). And the policies are fine: 24-hour toll-free tech support, one year of free on-site service, and a warranty that covers parts for three years and labor for one.

9 Vektron PCI P-75

REVIEWED: July 1995

PROS: Fast, one of the cheapest Pentium-75 computers you can buy

CONS: Short one-year warranty, tech support available only during business hours

10 Netis N4100

NEW THIS MONTH

PROS: Great price, large hard drive

CONS: Slowest system on our chart, one-year parts warranty

The Netis N4100 isn't slow for its CPU class—it just can't run with the much faster Pentium systems that are taking over our budget Top 20. Especially if you're set on running Windows 95 at a high level of efficiency, you'll find that the performance level of this PC is somewhat marginal. However, at $1590, this compact system is the cheapest PC on the chart—not just the slowest. And, it does have quite a lot to offer. The only AmDX4-100 system on the budget list, it offers cheap entrée to a satisfying feature set: 8MB of RAM, 256K of secondary cache, a hefty 1278MB Conner hard disk, a quad-speed CD-ROM drive, a Sound Blaster 16 sound card, and speakers.

Netis N4100

Budget systems often cut costs by using DRAM video cards, such as the Diamond Stealth 64 PCI adapter included with the Netis. Fortunately, these cards generally perform well when set for 256 colors and used with business applications. The N4100's configuration is unusual because it provides a hefty 4MB of DRAM, which means you get up to 16 million colors at 1024 by 768 resolution. The included 15-inch Sampo monitor matches up nicely and provides a 14-inch–diagonal viewing area.

Expandability is quite good. You get four free drive bays in the compact case (three externally accessible); two ISA slots, two PCI slots, one ISA or PCI slot, and three SIMM sockets are also available for future upgrades.

The Netis warranty covers parts for just one year but provides free labor for three. In addition, the company promises a quick two-day turnaround on factory repairs, and tech support is available 10 hours each weekday and 6 hours on Saturdays. The N4100 is a very complete package for the money, but you'll have to ask yourself if you'd rather spend $100 or so more to get a faster system.

11 HiQ Neptune PowerStation P100

REVIEWED: July 1995

PROS: Excellent expandability, 1083MB hard drive

CONS: Short one-year parts warranty, bare-bones manuals

12 HiQ Saturn Station

REVIEWED: November 1995

PROS: Powerhouse performance, ample storage, elegant design

CONS: Bare-bones feature set, lean software bundle

13 Micro Express MicroFlex-PCI/P902

REVIEWED: October 1995

PROS: Fine Pentium-90 performance, low $2024 price

CONS: No sound, entry-level 540MB hard drive

14 Netis N5100

REVIEWED: October 1995

PROS: Reasonable $2420 price, fast Pentium-100 performance, quad-speed CD-ROM drive, spacious 1278MB hard drive

CONS: One-year warranty is scant these days, no sound card

15 Polywell Poly DX4-100

REVIEWED: April 1995

PROS: Great price for multimedia DX4-100, nice software bundle

CONS: Some internal cable clutter

16 Quantex QP5/75 M-1

REVIEWED: September 1995

PROS: Full multimedia setup and generous software bundle for $1799

CONS: One-year warranty, below-average reliability, few open slots

17 Netis N575

REVIEWED: October 1995

PROS: Excellent price, fine Pentium-75 performance, 16MB of RAM, 1278MB hard drive

CONS: One-year parts warranty, no CD-ROM drive or sound

18 Intelesys Star 75

REVIEWED: May 1995

PROS: Solid Pentium-75 performance, low $1799 price

CONS: Cable-strewn interior makes adding expansion cards a chore

19 Quantex QP5/90 M-3

REVIEWED: March 1995

PROS: Good performance for a Pentium-90, 1083MB hard drive, 17-inch monitor

CONS: One-year warranty is substandard when most vendors offer longer guarantees, reader responses to our fax-back survey indicate below-average reliability

20 Compaq ProLinea 575

REVIEWED: September 1995

PROS: Well built, excellent service and reliability, $320 price drop to $1954

CONS: Small 425MB hard drive, no CD-ROM drive

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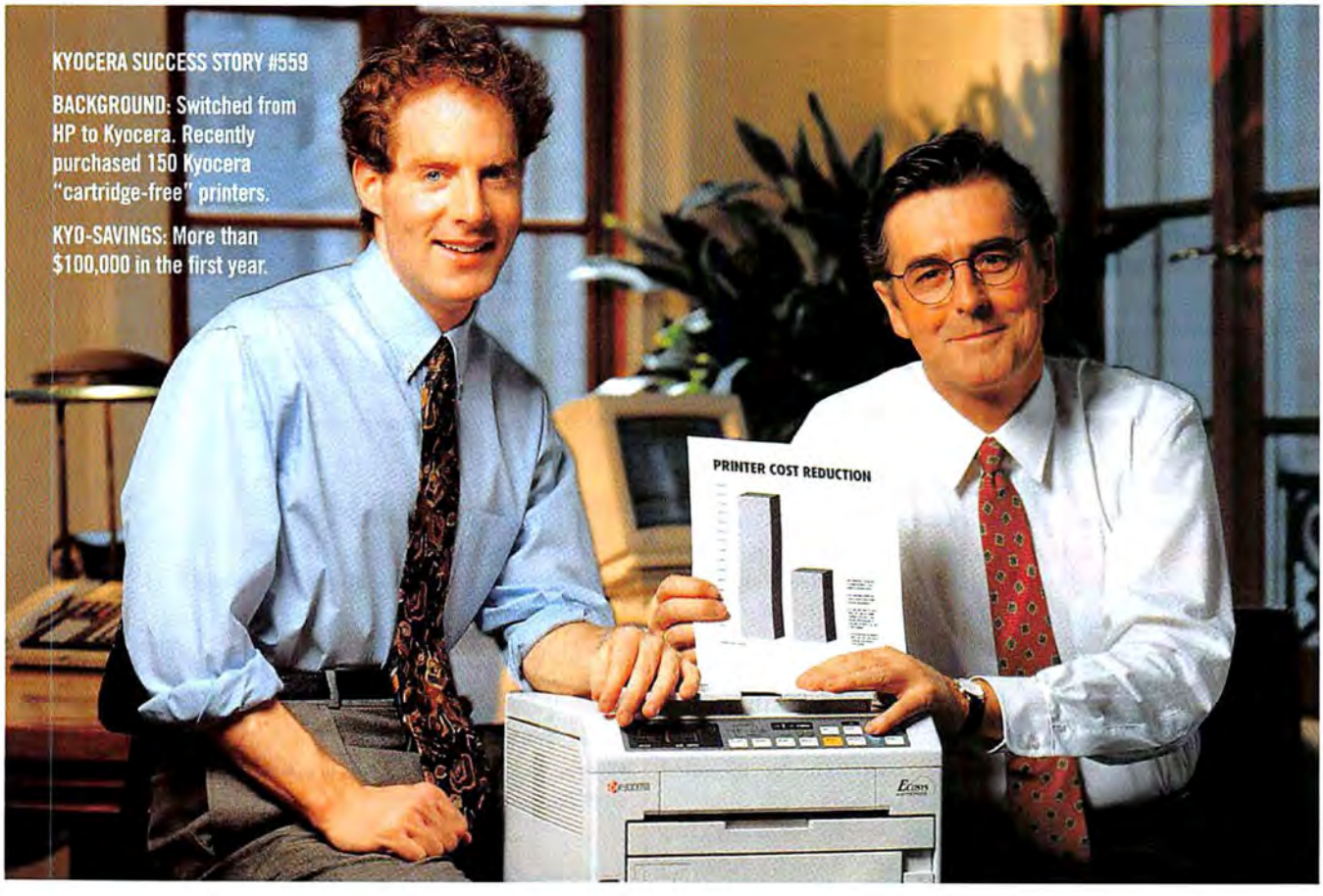

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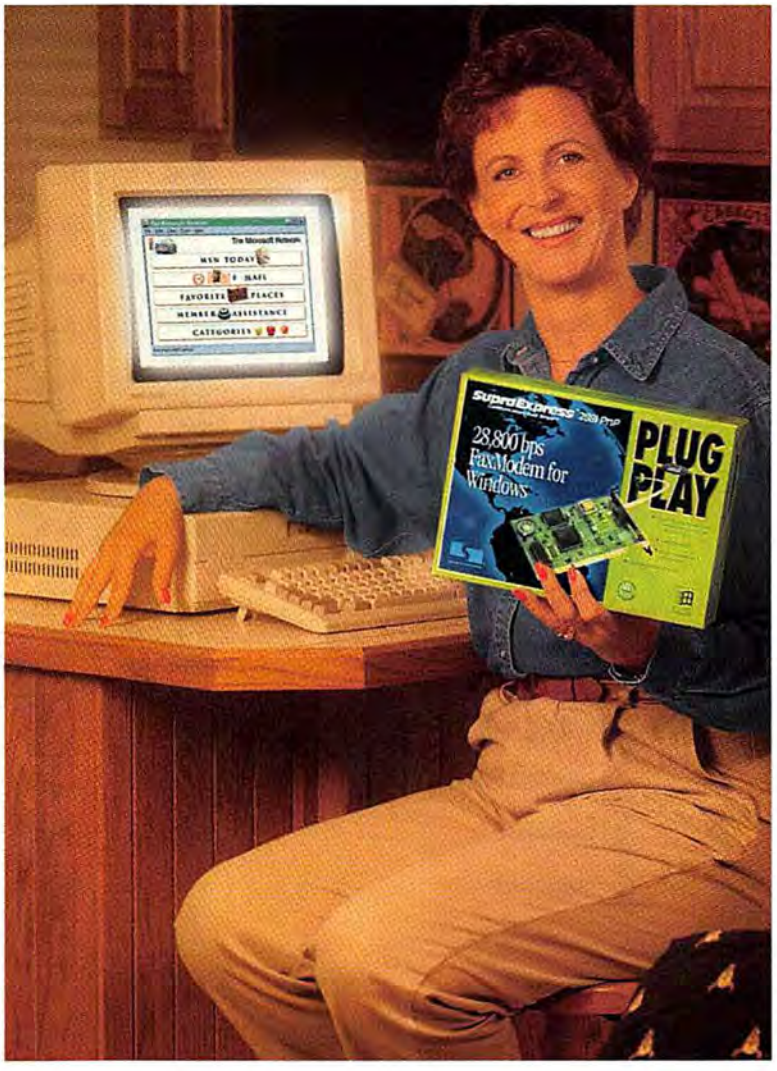

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THE PC WORLD TOP 20

NOTEBOOK PCs

1 **Toshiba Portégé 610CT**
Ultralight Pentium powerhouse.

POWER SYSTEMS

		Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1	Toshiba Portégé 610CT	–	1	current	107	73	82/75	$4649	Pentium-90	8	720
2	Dell Latitude XPi P90T	1	2	Nov 95	106	71	77/73[3]	$5399	Pentium-90	16	810
3	Dell Latitude XPi P75D	2	2	Nov 95	105	61	77/73[3]	$3899	Pentium-75	16	810
4	NEC Versa 2000C	–	1	current	103	46	68/73[3]	$2795	DX4-75	8	540
5	Toshiba Satellite T2130CT	–	1	current	102	44	82/75	$3299	DX4-75	8	520
6	WinBook XP DX4-100	–	1	current	101	59	68/70	$4159	DX4-100	16	810
7	Texas Instruments TravelMate 5100	3	2	Nov 95	101	66	62/76[3]	$5898	Pentium-90	16	1215
8	Texas Instruments TravelMate 5000	4	3	Oct 95	100	58	62/76[3]	$4799	Pentium-75	8	810
9	Compaq Contura 430C	–	1	current	99	40	72/79	$2999	DX4-100	8	720
10	Compaq Contura 420CX	5	2	Nov 95	98	42	72/79	$3199	DX4-75	8	420

BUDGET SYSTEMS

		Last month	Months on chart	First reviewed	Overall rating	Performance rating	Reliability/ service rating	Price	CPU	RAM (MB)	Hard drive (MB)
1	Dell Latitude LX 4100D	1	2	Nov 95	96	50	77/73[3]	$2629	DX4-100	8	420
2	Austin StepLite DX4-75	–	1	Sep 95	93	38	68/[3]	$2317	DX4-75	8	340
3	Sharp PC-3010	4	4	Sep 95	93	33	[3]	$1899	Cx486DX2-66	8	324
4	NEC Versa V/75C	2	2	Apr 95	92	44	68/73[3]	$2700	DX4-75	8	540
5	WinBook XPC	5	3	Oct 95	92	30	68/70	$2519	486DX2-50	16	351
6	CTX EzBook DX4/75	8	4	Sep 95	91	36	[3]	$2298	DX4-75	8	340
7	Acom Patriot 4000 F	7	2	Nov 95	91	49	[3]	$2190	DX4-100	8	543
8	SwanNote DX4-75	6	2	Nov 95	91	36	[3]	$2199	DX4-75	8	524
9	MPC TouchNote	–	1	current	90	35	[3]	$1899	Cx486DX2-66	8	351
10	AMS SoundPro DX4-75	12	3	July 95	90	42	[3]	$2471	DX4-75	8	340

BEST BUY

[1] CA = color active, CD = color dual-scan, CP = color passive [2] Call 800/434-4495 (for payment by Visa or MasterCard) or 900/903-2972 (for telephone billing) and use the fax reprint numbers listed above to order fax copies of system reviews. You can order three systems' capsule reviews ($4.95), a single capsule review plus features table and test report ($4.95), an entire month's review ($9.95), and a list of all systems tested by the PC World Test Center ($4.95). In addition, you can order next month's Top 20 charts and capsule reviews in advance (The Top 20 Flash Report, $9.95; available November 26). Touch-tone phone required.

2 **Dell Latitude XPi P90T**
Pentium has a great battery.

1 **Dell Latitude LX 4100D**
Fastest budget note.

2 **Austin StepLite DX4/75**
Excellent price, battery

Weight (pounds)	Battery life (hours)	Screen type/ size [1]	Vendor contact number	Fax reprint number [2]	Reader service no.	Comments
6.4	5:25	CA/9.5"	800/457-7777	3721	845	Ultrafast subnote has full-size set of features, lithium ion battery, top reliability.
7.2	6:38	CA/10.3"	800/613-3355	3712	846	Top performer comes with lots of RAM, roomy hard drive, highly rated support.
7.2	6:18	CD/10.4"	800/613-3355	3713	847	Not as fast as the two power Best Buys, but still quick and well priced.
7.8	6:28	CA/9.5"	800/632-4636	3722	848	Snappy DX4-75 has excellent battery, very attractive price.
7.4	5:40	CA/10.4"	800/457-7777	3723	849	Well-rounded DX4-75 has an internal power supply, excellent reliability.
7.6	4:01	CA/10.3"	800/468-2162	3724	850	Fastest DX4-100 has robust configuration, multiple pointing device options.
7.6	6:09	CA/10.4"	800/848-3927	3714	851	TI's pricey P-90 has an enormous hard drive, lots of RAM, long battery life.
6.4	5:47	CA/10.3"	800/848-3927	3710	852	Quick, light beauty has an excellent screen and good battery life.
7.4	7:42	CP/10.4"	800/345-1518	3725	853	Slow DX4-100 has a moderate price and a great battery.
7.4	6:08	CA/10.3"	800/345-1518	3704	854	DX4-75 actually outperforms its DX4-100 sibling.
7.4	5:48	CD/10.4"	800/613-3355	3716	855	Dell's top-ranked budget note features DX4-100 speed and long battery life.
6	6:19	CP/9.3"	800/331-1501	3726	856	A $600 price drop catapults ultralight DX4-75 to a Best Buy.
7.2	5:14	CD/10.4"	800/237-4277	3705	857	Cyrix DX2-66 note with a solid battery ties with MPC for lowest price.
8.8	3:01	CA/9.5"	800/632-4636	3717	858	Heavy DX4-75 has good speed and an 800 by 600 screen but only a fair battery.
7.2	4:34	CD/10.3"	800/468-2162	3711	859	Budget offering is slowest Top 20 note but has lots of RAM.
7.6	5:49	CP/10.3"	800/888-9052	3706	860	Solid performer has a large screen and fine battery life.
7.8	3:12	CP/10.2"	800/898-2665	3719	861	Want great speed and don't need long battery life? Check out this DX4-100.
6.8	3:16	CP/9.3"	800/261-7926	3718	862	Roomy hard drive but just fair battery life.
7.4	4:24	CD/10.3"	800/672-9979	3726	863	Rock-bottom price for no-frills unit with awkward touchpad placement.
8.4	4:06	CA/9.4"	800/886-2671	3707	864	Fast, heavy DX4-75 with sound and active color gets boosted by $200 price drop.

[3] We received fewer than 100 Reliability and Service Monitor responses for this company. Its ratings here are based on a combination of responses for it and for all companies for which we received 20 to 99 responses. (If we received fewer than 20 reliability or 20 service responses for a company, no score appears.)

For more information about all products in this table, circle reader service no. 913.

Top 20 Notebook PCs

HALF OF THE NOTEBOOKS ON THIS MONTH'S power chart are Pentiums. The top two machines are Pentium-90s: The Toshiba Portégé 610CT—a subnote and our new number one—moves last month's leader, the Dell Latitude XPi P90T, to second spot. Meanwhile, DX4-100 and DX4-75 notebooks still make their mark. We review WinBook and Compaq DX4-100 models along with new NEC and Toshiba DX4-75s.

The winds of change have stirred less noticeably on our budget notebook chart, and last month's number one model, the Dell Latitude LX 4100D, is still on top. Austin's StepLite DX4/75 has ridden a price drop of more than $600 onto our budget chart, to a number two Best Buy position. The one new budget note reviewed this month is MPC's TouchNote, an ultracheap Cx486DX2-66 PC.

Power Notebooks

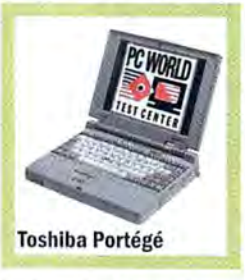
1 Toshiba Portégé 610CT

NEW THIS MONTH

PROS: Very good battery life, fast, compact, built-in sound, three-year warranty

CONS: Cramped keyboard, relatively narrow screen-viewing angle

Toshiba's new $4649 Portégé 610CT makes few of the design trade-offs you often see in subnotebooks. Its lithium ion battery lasted nearly 5.5 hours in our tests, and the P-90 processor turned in some of the highest performance numbers we've seen from a portable. You get 8MB of EDO RAM, a 720MB hard drive, 16-bit sound, and a built-in speaker. Toshiba includes full-motion video clips with the system, and we were impressed with their exceptionally smooth playback. Yet the whole notebook measures less than 2 inches high and takes up less space than a piece of standard letterhead. With external floppy drive in tow, it weighs just 6.4 pounds.



Toshiba Portégé

This system's weak spots—as with most subnotes—are its keyboard and minijoystick, which feel cramped. The reasonably bright, 9.5-inch active-matrix screen maxes out at 256 colors and can be a bit hard to view at an angle.

Toshiba backs the 610CT with a three-year warranty and round-the-clock tech support. The thick manual is clearly written and well illustrated. Reader responses to our fax-back support survey rank Toshiba's notebooks at the top in both reliability and service.

2 Dell Latitude XPi P90T

REVIEWED: November 1995

PROS: Fast, excellent battery life, good documentation, three-year warranty

CONS: Pricey

The $5399 price is stiff, but there are no compromises with this notebook. It's a fast 7.2-pound Pentium-90 with 16MB of RAM, an 810MB removable hard drive, and a lithium ion battery that lasted over 6.5 hours in our tests—fantastic for a Pentium notebook. The bright 10.3-inch active-matrix screen displays up to 16.8 million colors. Dell's support is dependable.

3 Dell Latitude XPi P75D

REVIEWED: November 1995

PROS: Fast, over 6 hours of battery life, superior docs, three-year warranty, 810MB hard drive

CONS: None significant

4 NEC Versa 2000C

NEW THIS MONTH

PROS: Solid performance, active-matrix display, outstanding battery life, internal fax-modem

CONS: Documentation could be better illustrated

If the NEC Versa 2000C's stylish, sculpted case doesn't get your attention, the system's price and quality will: $2795 is very reasonable for a DX4-75 notebook with 8MB of RAM, a 540MB hard drive, and a color-active screen. And the high-quality lithium ion cells kept the notebook running for almost 6.5 hours in our tests.

Equipped as it is with a DX4-75 processor, the Versa 2000C can't compete with the top-ranking Pentiums on the chart, but it's a good midrange performer. The 9.5-inch screen provides outstanding clarity at a resolution of 640 by 480 with up to 65,536 colors.

NEC

The Versa 2000C incorporates an internal 14.4-kbps fax-modem, and NEC bundles an Internet browser and starter kits for America Online, CompuServe, and Prodigy. The VersaGlide pointing device—NEC's version of the increasingly popular touchpad—is positioned at the front and center of a full-size keyboard that has quiet action and a soft feel. The notebook's case seems strong, has very little flex, and should stand up well to road wear.

Documentation is accurate but rudimentary from a technical standpoint—don't expect much in the way of schematics and diagrams. Fortunately, everything the typical user needs to know to get the machine up and running is covered in the manual and in a Windows help file. NEC provides a one-year warranty. Fax-back reader response gives the company average marks on reliability and good marks on service.

SHOPPING FOR A 17" MONITOR?

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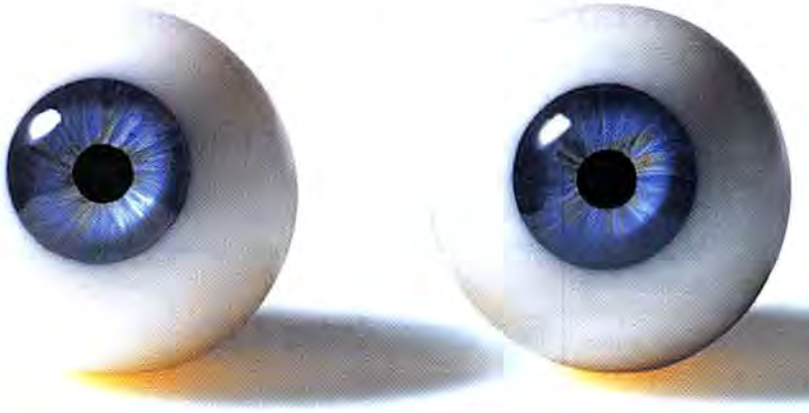

"If you stare into only one 17-inch screen this year, let it be Nokia's...," said the editors of *Home Office Computing*. Excellent advice, if you want to rub your eyes in astonishment — not irritation.

Nokia makes speakers for German luxury cars, so adding them to monitors was easy.

Even at first glance, the difference is clear. Whether it's the Nokia 447X professional caliber system (voted the Best Monitor of 1995*) or the multimedia 447L with built-in speakers (which *HOC* Editors examined,) you'll enjoy unparalleled clarity.** At their maximum refresh rates, either can render images of near photographic stability. The longer you look, the deeper your appreciation goes. Nokia exclusives like the MicroEmission™ option and the anti-glare coating make these the world's most user-sensitive monitors with an actual diagonally-measured viewing area of 15.50" — far surpassing the health and environmental criteria of MPRII. They even give you complete plug-and-play connectivity under Windows 95.

So you owe it to yourself to consider a Nokia. Never has "visionary technology" been truer. Or more important. Call 1.800.BY NOKIA for your nearest dealer.

MAXIMUM REFRESH RATE FOR EACH RESOLUTION						
RESOLUTION	640×480	800×600	1024×768	1152×870	1280×1024	1600×1200
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44X 17"	113Hz	110Hz	90Hz	80Hz	75Hz	62Hz

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Circle 168 on reader service card

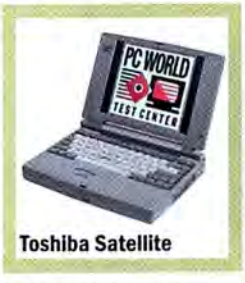
5 Toshiba Satellite T2130CT

NEW THIS MONTH

PROS: Long battery life, needs no AC adapter, built-in sound, 24-hour tech support

CONS: Screen viewing angle relatively narrow

Priced at a reasonable $3299, this unit is an uncommonly well designed business notebook that delivers long battery life and strong DX4-75 performance. It comes with 8MB of RAM and a 520MB hard disk, 16-bit sound, a built-in speaker, and PC Card slots ready for Plug and Play cards as they become available. The NiMH battery lasted a long 5.7 hours in our run-down tests.



Toshiba Satellite

The 7.4-pound Satellite has a roomy keyboard that's comfortable to use with the system's AccuPoint minijoystick pointing device. The internal power supply saves you the burden of an AC adapter—all you need is the power cord. The 10.4-inch active-matrix color screen is one of the largest shipping with today's notebooks, but it's more difficult to view from certain angles than many similar screens on the market—and it delivers only 256 colors instead of the higher color depths we're beginning to see.

The large manual is thorough and well illustrated. Respondents to our fax-back support survey give a thumbs-up to Toshiba for making reliable notebooks. The company's support policies include a one-year warranty and 24-hour technical support.

6 WinBook XP DX4-100

NEW THIS MONTH

PROS: Blazing performance for a DX4-100, variety of pointing device options

CONS: No voice software to go with voice fax-modem, one-year warranty

DX4-100 processors are old news—even in notebooks—but this WinBook XP implementation proves there's still life in the old CPU. The fastest DX4-100 portable we've tested, its benchmark scores approach those of many Pentium-75 notes. Performance aside, though, the WinBook's battery life of about 4 hours is just respectable, and it weighs 7.6 pounds.

Our $4159 unit came with 16MB of RAM, an 810MB hard disk, and a 10.3-inch active-matrix color screen. The system's keyboard has a solid feel, and the wide selection of pointing devices offers something for everyone. You can supplement the standard keyboard-mounted minijoystick with a $29.95 trackball or a $79.99 touchpad. Our unit came with the touchpad and also included 16-bit stereo sound, a $79.95 option.

WinBook

Unlike most notebook PCs, the WinBook XP locates its floppy drive on the left side of the case, a design decision that may prove a minor irritation to right-handers. And although the system includes a 14.4-kbps fax-modem that can serve as a digital answering machine, the company doesn't provide the software you need to take advantage of this useful feature.

The WinBook XP comes with only a one-year warranty—not a stellar offering, even for a notebook. The company's reliability and service, as graded by the many faxed responses we've received from readers, is about average.

7 Texas Instruments TravelMate 5100

REVIEWED: November 1995

PROS: 6-hour battery life is long for a Pentium-90; huge 1215MB hard drive, multimedia

CONS: Pricey at $5898

8 Texas Instruments TravelMate 5000

REVIEWED: October 1995

PROS: Lightweight, great performance, good battery life

CONS: Documentation lacks detail, mouse buttons tough to master

9 Compaq Contura 430C

NEW THIS MONTH

PROS: Low price, nice design, incredible battery life

CONS: Slow for a DX4-100

Compaq buyers expect the best, and in most respects this inexpensive power notebook delivers. The Contura 430C's battery life is spectacular—the NiMH cells kept the unit running for almost 7.75 hours in our tests. And its design is exemplary: The case is rugged and virtually flex-free, with none of the flimsy port covers you find even on some expensive notebooks. Connectors are recessed well out of harm's way. The keys are large and nicely laid out, and the trackball is placed comfortably left of center. The Contura's $2999 price is also user-friendly for a 7.4-pound DX4-100 note with 8MB of RAM, a 720MB hard drive, and a bright, clear 10.4-inch passive color screen.

Compaq 430C

The main disappointment is performance. The Contura 430C is the slowest machine on our Power Notebooks chart, and several DX4-75 notebooks we've tested have turned in faster times.

The manuals and online help files that come with the Contura 430C provide clear, detailed, accessible help. Compaq service and support policies are superb, including a three-year warranty, fast two-day turnaround on factory repairs, and 24-hour toll-free technical support. Three years of on-site service costs $149 extra. Compaq has had some increase in problems with systems, reflected in recent reader response to our ongoing fax-back survey on reliability and service. As a result, Compaq's typically high notebook support ratings have dropped a notch—although they are still good.

10 Compaq Contura 420CX

REVIEWED: November 1995

PROS: Good price, 6-hour battery, very good support

CONS: No software bundle, small 420MB hard drive

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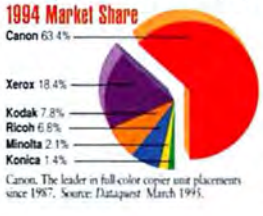

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Circle 42 on reader service card

Budget Notebooks

1 Dell Latitude LX 4100D

REVIEWED: November 1995

PROS: Fast, 5.75-hour battery life, large screen, three-year warranty

CONS: Cramped keyboard

The $2629 Latitude LX 4100D includes 8MB of RAM, a decent 420MB hard drive, and a 10.4-inch color dual-scan display.

2 Austin StepLite DX4-75

REVIEWED: September 1995

PROS: More than 6.25 hours of battery life, fax-modem, ethernet adapter

CONS: Performance lags a bit with some Windows applications

This 6-pound bantamweight's $700 drop in price makes up for its slowish performance and small 340MB hard drive.

3 Sharp PC-3010

REVIEWED: September 1995

PROS: Inexpensive, long battery life, excellent screen, GlidePoint touchpad, infrared capability

CONS: Somewhat limited support policies

4 NEC Versa V/75C

REVIEWED: April 1995

PROS: Fast, 800 by 600 active-matrix color screen, three-year warranty

CONS: Heavy 8.8-pound traveling weight, short 3-hour battery life

5 WinBook XPC

REVIEWED: October 1995

PROS: Reasonable $2519 price, fax-modem, 16MB of RAM

CONS: One-year warranty

6 CTX EzBook DX4/75

REVIEWED: September 1995

PROS: Low price, good battery life, comfortable keyboard and touchpad

CONS: No weekend tech support

7 Acom Patriot 4000 F

REVIEWED: November 1995

PROS: Low price for DX4-100 with 543MB hard disk, good performance

CONS: One-year warranty, awkward pointing device, mediocre battery life

8 SwanNote DX4-75

REVIEWED: November 1995

PROS: Low price, extra battery, on-site service

CONS: Poor documentation, one-year warranty, mediocre battery life

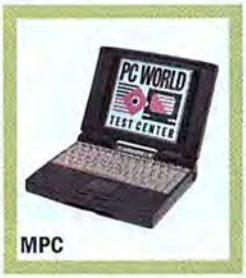
9 MPC TouchNote

NEW THIS MONTH

PROS: Exceptionally low price, sound

CONS: Poor touchpad placement, one-year warranty

At $1899, the 7.4-pound TouchNote is one of the least expensive models available, but it has some notable drawbacks. It's fairly fast for a Cyrix 486DX2-66 with 8MB of RAM and a 351MB hard drive. The 10.3-inch dual-scan color display has highly adjustable brightness and contrast to fit your working conditions. Battery life is solid—almost 4.5 hours in our tests.



MPC

MPC's documentation and service policies are less impressive. The manual covers several different notebooks, so it falls a bit short on details for this specific model.

The location of the touchpad is a major design flaw. Its right-of-center position makes it all too easy for the user's right thumb to skim over the trackball. We often moved the cursor inadvertently and found that we'd typed over text. We'd recommend an external mouse, but if you go this route you'll have to use a PC Card modem because the TouchNote has just one serial port.

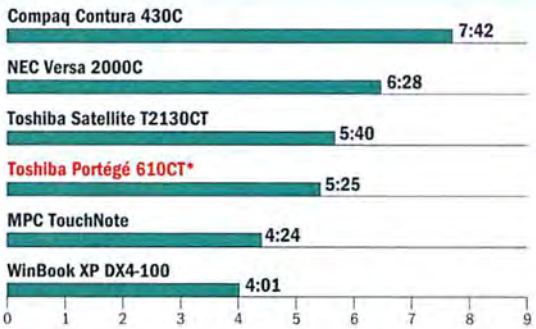
10 AMS SoundPro DX4-75

REVIEWED: July 1995

PROS: Fast for its CPU class, sound, active-matrix color screen

CONS: One-year warranty, heavy 8.4-pound weight

TEST REPORT **Battery Life**



* Best Buy

Time in hours:minutes.

Methodology
We drain and fully recharge the battery twice and set power-saving options to match a consistent profile where possible. Office workers use Windows applications, periodically saving and allowing regular idle time. Notebooks are rotated among workers. We report the time elapsed when the notebook shuts itself off.

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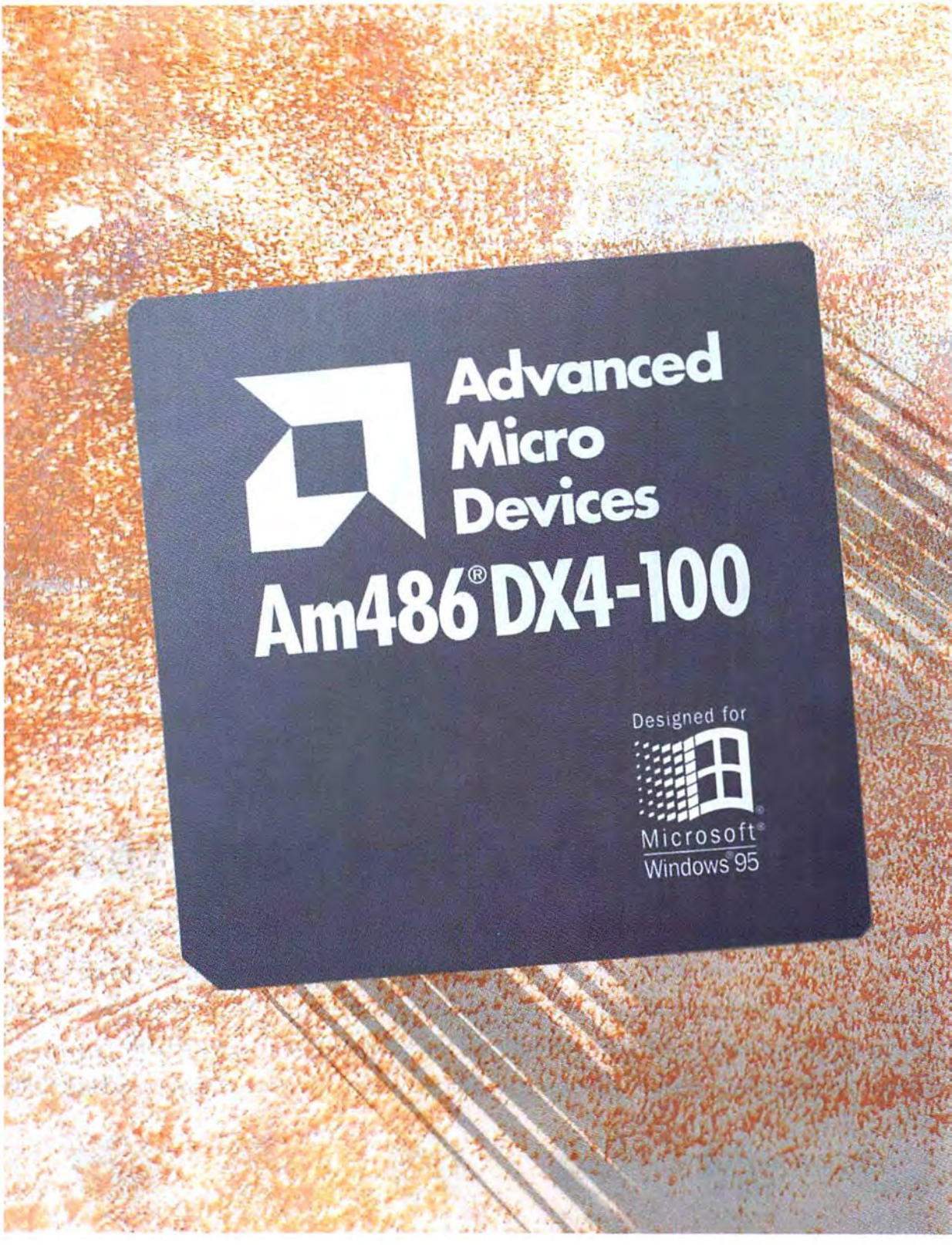
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FEATURES COMPARISON This Month's Contenders—Desktops

● = Yes ○ = No
n/a = not applicable

Standard features	AST Bravo MS P/133	Dell Dimension P75t	Dell OptiPlex XMT 5133	DTK Quin-54M/P133	Gateway 2000 P5-75	Gateway 2000 P5-120	Netis N4100	Polywell Poly 4120P8
Street price as of 8/28/95 [1]	$2980	$1679	$4922	$3390	$1739	$2699	$1590	$1895
CPU	Pentium-133	Pentium-75	Pentium-133	Pentium-133	Pentium-75	Pentium-120	AmDX4-100	AmDX4-120
CPU or upgrade socket	320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF	237-pin ZIF	237-pin ZIF
BIOS	AMI 1.00.98	Award 0.03.01	Phoenix 1.10 A09	Award 4.50PG	AMI 1.00.0BS0	AMI 1.00.03	Award 4.50G	Award 4.50G
Installed/maximum RAM (MB)	16/128	8/128	16/128	16/128	8/128	16/128	8/128	8/256
SIMM sockets/number free	4/2	4/2	4/2	4/2	4/2	4/2	4/3	4/3
Secondary RAM cache installed/maximum (K)	256/256	0/256	256/512	512/512	0/0	256/256	256/512	256/512
Case style	minitower	minitower	minitower	tower	compact	compact	compact	minitower
Free externally accessible 3½-inch/5¼-inch drive bays	0/3	0/2	0/2	1/2	0/2	0/2	1/2	1/2
Free internal 3½-inch/5¼-inch drive bays	2/0	1/0	1/0	2/0	2/0	2/0	1/0	1/0
Free 32-bit EISA/16-bit ISA/8-bit ISA expansion slots	0/4/0 [2]	0/3/0 [2]	0/5/0 [3]	0/5/0 [2]	0/4/0 [2]	0/3/0 [2]	0/3/0 [2]	0/3/0 [2]
PCI or VL bus slots/number free	2 PCI/2 [2]	4 PCI/4 [2]	2 PCI/2 [3]	3 PCI/2 [2]	3 PCI/2 [2]	4 PCI/3 [2]	4 PCI/3 [2]	3 PCI/2 [2]
Hard disk	WD AC 31600H	Quantum Fireball	WD Caviar AC31000	Quantum Fireball	WD Caviar AC2540	WD AC 31600H	Conner CFA1275A	Quantum Fireball
Size (MB)	1624	540	1083	1080	540	1083	1278	1080
Adapter	integrated	integrated	integrated	integrated	integrated	integrated	integrated	integrated
Floppy drives (MB)	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44
Graphics adapter	ATI Mach 64	S3 Trio64	S3 Vision864	Diamond Stealth 64	STB Powergraph 32	ATI Mach 64	Diamond Stealth 64	Diamond Stealth 64
Installed VRAM/DRAM (MB)	2/0	0/2	0/2	2/0	0/1	0/2	0/4	2/0
Monitor	AST Vision5L	Dell D1528-LS	Dell D1728-LS	ADI MicroScan 5AP	Vivitron 1572	CrystalScan 1572DG	Sampo AlphaScan KDM1566V	Sampo AlphaScan KDM1566
Tube/viewable area (diagonal inches)	15/14	15/13.8	17/15.6	17/15.3	15/14	15/14	15/14	15/13.9
Dot pitch (mm)	.28	.28	.28	.26	.25	.28	.28	.28
Modem speed for fax/data (kbps)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sound board	integrated	n/a	Sound Blaster 16	Sound Blaster 16	n/a	n/a	Sound Blaster 16	Vibra 16S
CD-ROM drive	n/a	Mitsumi FX400-02	NEC CDR 260R	Toshiba XM-5302B	Torisan CDR-S1G	Torisan CDR-S1G	DCS Multi-media World	Matsushita CR-574-B
Data transfer rate (K/sec)	n/a	700	600	600	600	600	600	600
Parallel/serial/mouse/SCSI ports	1/2/1/0	1/2/1/0	1/2/1/0	1/2/0/0	1/2/1/0	1/2/1/0	1/2/0/0	1/1/0/0
Service and support								
Warranty for parts/labor (years)	3/3	3/1	3/3	2/2	3/1	3/1	1/3	2/5
30-day money-back guarantee	○	●	●	○ [4]	●	●	●	●
On-site service first-year price	free	free	free	$50	free	free	free	$75
Repair turnaround policy (days at service center)	7	○	○	5	○	○	2	2
Daily toll-free phone support (hours)	24	24	24	12	24	24	10	10
Weekend support	●	●	●	○	●	●	● [5]	● [5]
BBS/fax	●/●	●/●	●/●	●/●	●/●	●/●	●/●	●/●

BEST BUY

[1] All systems priced as configured with DOS 6.0 or later version, Windows 3.1, VGA and color monitor, keyboard, and mouse or other pointing device. Price is direct or based on vendor estimate.
[2] One less 16-bit slot available when all PCI slots are filled, and vice versa.
[3] Two less 16-bit slots available when all PCI slots are filled, and vice versa.
[4] Replacement only.
[5] Saturdays only.

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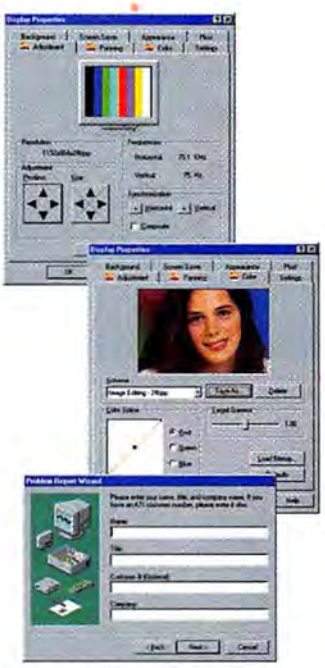

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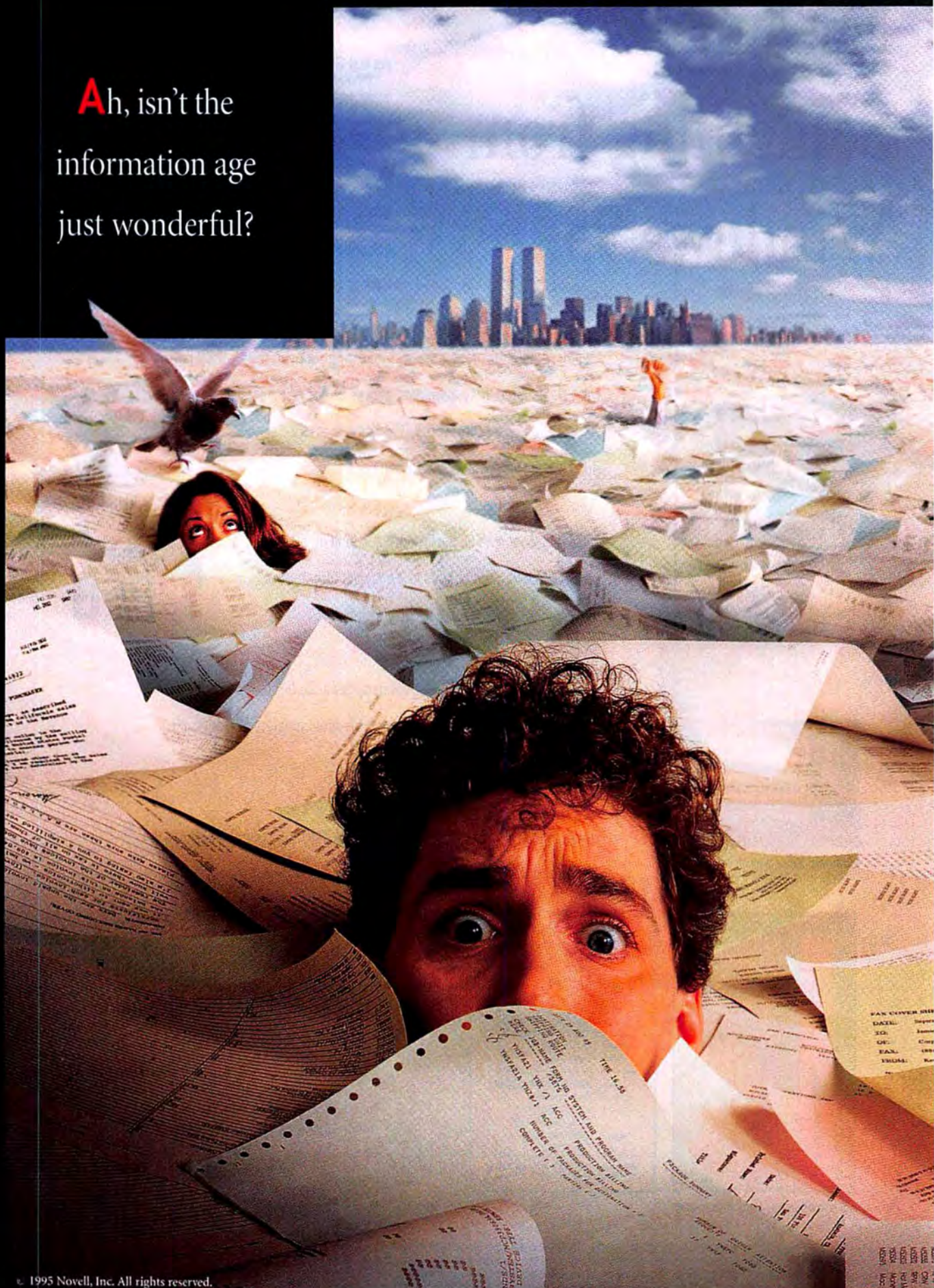
Circle 5 on reader service card



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Desktop Snapshots

These desktop systems were tested and reviewed along with the others but didn't score high enough to reach the Top 20 charts.

Blackship P-133 Centurion

PROS: Good price, Toshiba SCSI 4X CD-ROM drive

CONS: Sluggish for a 133-MHz Pentium, poor documentation

This slow P-133 system has a 1200MB hard drive and no weekend tech support. $2995. *Blackship Computer Systems, 800/531-7447, 408/432-7500* **Reader service no. 865**

DFI Landmarq P120 VPMS

PROS: Multimedia configuration, 1624MB hard drive

CONS: Pricey, very slow, no toll-free tech support

Slow performance hurts this well-configured Pentium-120 tower. $4109. *DFI, 800/808-4334, 916/568-1234* **Reader service no. 866**

DFI Landmarq P133 VPMS

PROS: Multimedia configuration, fax-modem, 17-inch monitor

CONS: Expensive and slow, no toll-free tech support

This pricey tower's full load includes a 1624MB hard drive. $4099. *DFI, 800/808-4334, 916/568-1234* **Reader service no. 867**

Diamond DT-P100MM

PROS: Solid performance, full multimedia, terrific price

CONS: Small monitor, poor marks for reliability and service

P-100 minitower has just a 14-inch monitor; negative fax-back survey response. $2075. *Diamond, 800/989-7253* **Reader service no. 868**

Diamond DT-P133MM

PROS: Very fast, good price, multimedia configuration

CONS: Poor reliability and support, one-year warranty

P-133 minitower has a 1080MB hard drive and a 15-inch monitor. $2845. *Diamond, 800/989-7253* **Reader service no. 869**

EPS P-75

PROS: Very good software bundle, solid expandability

CONS: Poor service and reliability, interior cable clutter

This minitower includes a Number Nine 9FX Motion graphics adapter that supports software MPEG, but EPS's reliability and service ratings are unfavorable. $2295. *EPS, 800/447-0921* **Reader service no. 870**

Intergraph TD-30 Personal Workstation

PROS: Excellent design and construction

CONS: Very expensive, only one free drive bay

A big price keeps this slow but well-built PC off our chart. $6925. *Intergraph Computer Systems, 800/763-0242* **Reader service no. 871**

Midwest Micro P5-75 Home PC

PROS: Low price, voice fax-modem, three-year warranty

CONS: Clutter obstructs RAM upgrades; so-so documentation

So-so reliability hurts this otherwise-solid PC. $2035. *MidWest Micro, 800/871-9128* **Reader service no. 872**

Midwest Micro P5-133

PROS: Three-year warranty, great multimedia and CD bundle

CONS: Fairly low fax-back reliability scores, no on-site service

Fast, pricey minitower has a 1624MB hard drive and a 17-inch monitor. $3699. *MidWest Micro, 800/871-9128* **Reader service no. 873**

Mitac DM5400S

PROS: Nice software bundle, multimedia configuration

CONS: Slow, pricey, tech support available from dealers only

P-100 has limited expandability, a flimsy keyboard, poor service and reliability. $3390. *Mitac, 800/756-9888* **Reader service no. 874**

Netis N5120 Power

PROS: 1624MB hard drive, good price

CONS: One-year warranty, no multimedia components

No-frills minitower lacks the features to make our power chart. $2675. *Netis Technology, 800/577-7526* **Reader service no. 875**

PerComp P75 MediaPro

PROS: Multimedia, voice fax-modem, three-year warranty

CONS: Expensive for a Pentium-75

Some P-90s cost the same as this P-75 desktop. $2499. *PerComp Microsystems, 800/856-6688, 214/234-2198* **Reader service no. 876**

Robotech Cobra XL p133

PROS: Fast, expandable, 17-inch display, Novell Perfect Office

CONS: Some cable clutter

Multimedia P-133 with two-year warranty just misses our chart. $3689. *Robotech, 800/533-0633, 801/565-0645* **Reader service no. 877**

SmartWorks MT90MM

PROS: Solid performance for a good price, two-year warranty

CONS: No secondary cache

Multimedia PC is a good value; tough competition keeps it off our chart. $2249. *SmartWorks, 800/441-2210* **Reader service no. 878**

USA Flex PT-90 Multimedia Budget

PROS: Toshiba CD-ROM drive, modem, big software bundle

CONS: Slow performance, cramped interior

Fairly slow multimedia P-90 with 8MB of RAM and 853MB hard drive falls well shy of the Power Top 20. $2599. *USA Flex, 800/872-3539, 708/582-6202* **Reader service no. 879**

Vektron Power Windows Station

PROS: Very fast, inexpensive for a P-133, 1624MB hard drive

CONS: One-year warranty, no weekend tech support

Thin support policies keep this multimedia tower off our chart. $2995. *Vektron, 800/725-0026, 214/606-0280* **Reader service no. 880**

ZDS Z-Station GT

PROS: Network adapter, well built, 24-hour tech support

CONS: Very expensive, few free bays and slots

Multimedia PC is hurt by its high price. $5100. *Zenith Data Systems, 800/533-0331, 708/808-5000* **Reader service no. 881**

Notebook Snapshots

These notebooks were tested and reviewed along with the others but didn't score high enough to reach the Top 20 charts.

AMS MediaPro

PROS: Fast, three-year warranty, built-in CD-ROM drive, sound

CONS: Short 2-hour battery life, 10.8-pound traveling weight

DX4-100 has fine features, but its battery and weight hurt its value. $3960. *AMS, 800/886-2671* **Reader service no. 882**

Aspen Universa P Series

PROS: Great price; PC Card fax-modem and built-in sound

CONS: Short 2.2-hour battery life, 8.4-pound traveling weight

Color-active P-100 note performs more like a DX4-100. The keyboard and trackball are comfortable, but the trackball's buttons are hard to reach. $3520. *Aspen Computer, 800/472-3273* **Reader service no. 883**

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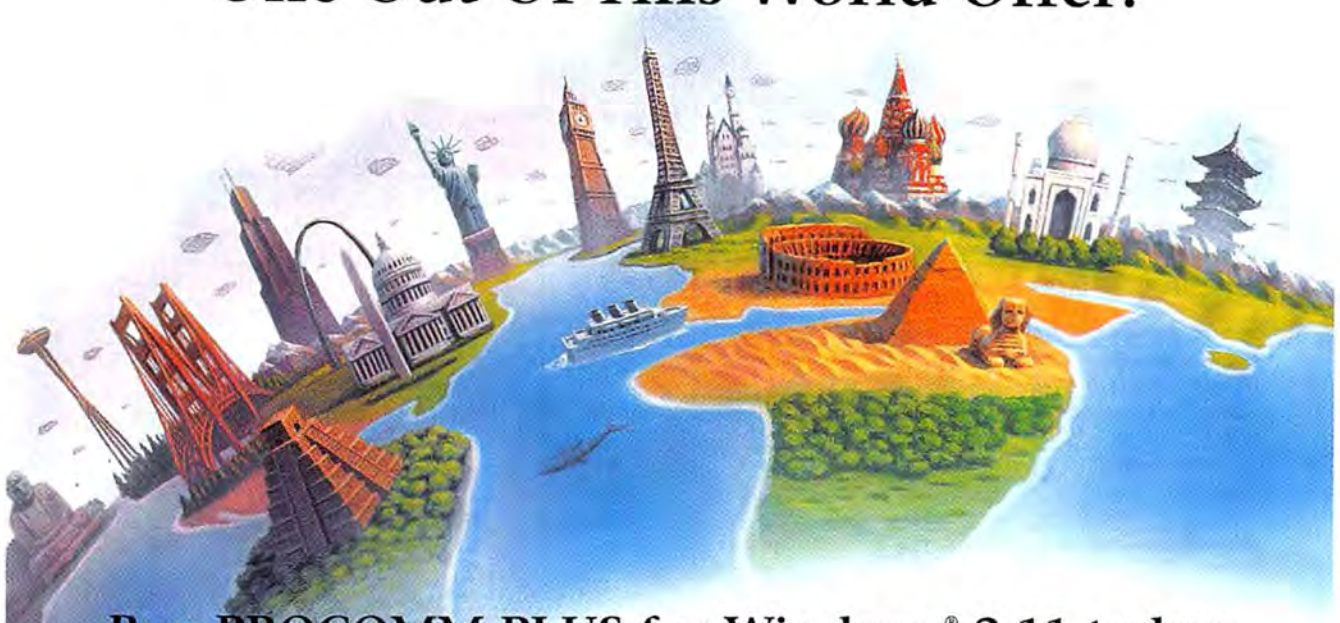

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* PROCOMM PLUS for Windows 3.0 upgrade will ship to you beginning January 2, 1996. Offer good for PROCOMM PLUS for Windows 3.0. Offer valid for purchases made between 11/1/95 and 1/31/96. Proof of purchase required plus $7.50 ($15.00 Alaska, Hawaii and Canada) for shipping and handling. This offer good only in the U.S., Puerto Rico and Canada.

FEATURES COMPARISON This Month's Contenders–Notebooks

● = Yes ○ = No

n/a = not applicable

Standard features	Compaq Contura 430C	MPC TouchNote	NEC Versa 2000C	Toshiba Portégé 610CT	Toshiba Satellite T2130CT	WinBook XP DX4-100
Street price as of 8/28/95 [1]	$2999	$1899	$2795	$4649	$3299	$4159
CPU	DX4-100	Cx486DX2-66	DX4-75	Pentium-90	DX4-75	DX4-100
Traveling weight (pounds) [2]	7.4	7.4	7.8	6.4	7.4	7.6
Width x depth x height (inches)	11.6 x 9 x 2.1	11.1 x 8.6 x 2.1	11.8 x 9.1 x 2.1	9.8 x 8.1 x 1.9	11.3 x 8.9 x 2.2	11.5 x 9.3 x 1.9
Installed/maximum RAM (MB)	8/24	8/32	8/40	8/40	8/32	16/32
Secondary RAM cache installed/maximum (K)	0/0	0/0	0/0	0/0	0/0	0/0
Installed/maximum hard disk (MB)	720/720	351/1350	540/720	720/720	520/520	810/810
Removable hard disk	●	●	●	○	○	●
Display type	color passive	color dual-scan	color active	color active	color active	color active
Measured screen diagonal (inches)	10.4	10.3	9.5	9.5	10.4	10.3
Maximum colors of LCD	256	256	65,536	256	256	256
Simultaneous LCD and external monitor	●	●	●	●	●	●
Highest resolution of external monitor	1024 x 768	1024 x 768	1024 x 768	1024 x 768	1024 x 768	1024 x 768
Mouse/keyboard ports	●/● [3]	●/● [3]	●/●	○/○	○/●	●/●
Cursor keys in inverted T	●	●	●	●	●	●
Dedicated page-control keys	○	●	●	●	●	●
All 12 function keys dedicated	●	○	○	●	●	●
Standard <Ctrl> and <Alt> layout	●	●	○	○	○	○
Built-in pointing device	●	●	●	●	●	●
Modem speed for fax/data (kilobits per second)	n/a	n/a	14.4/14.4	n/a	n/a	14.4/14.4
Docking station available	●	○	○ [4]	○ [4]	○	○
PC Card (PCMCIA) slot Type II/III	2/1 [5]	1/1 [5]	2/1 [5]	2/1 [5]	2/1 [5]	2/1 [5]
Power management						
Supports Advanced Power Management	●	●	●	●	●	●
Type of battery	NiMH	NiMH	lithium ion	lithium ion	NiMH	NiMH
Suspend button	●	●	●	○	●	●
Suspends when case closed	○	●	○	○	○	○
Service and support						
Warranty (years)	3	1	1	3	1	1
30-day money-back guarantee	● [6]	●	○	○	○	●
On-site/replacement service first-year price	$149	○	free	$50	$50	○
Repair turnaround policy (days)	2	3	1	2	2	3
Daily toll-free phone support (hours)	24	12	24	24	24	11
Weekend support	●	●	●	●	●	● [7]
BBS/fax	●/●	●/●	●/○	●/●	●/●	●/●

BEST BUY

[1] All notebooks priced as configured with DOS 6.0 or later version, Windows 3.1, VGA display, and mouse or other pointing device. Price is direct or based on vendor estimate.

[2] Includes computer, adapter, power cord, and external floppy drive, if notebook has one.

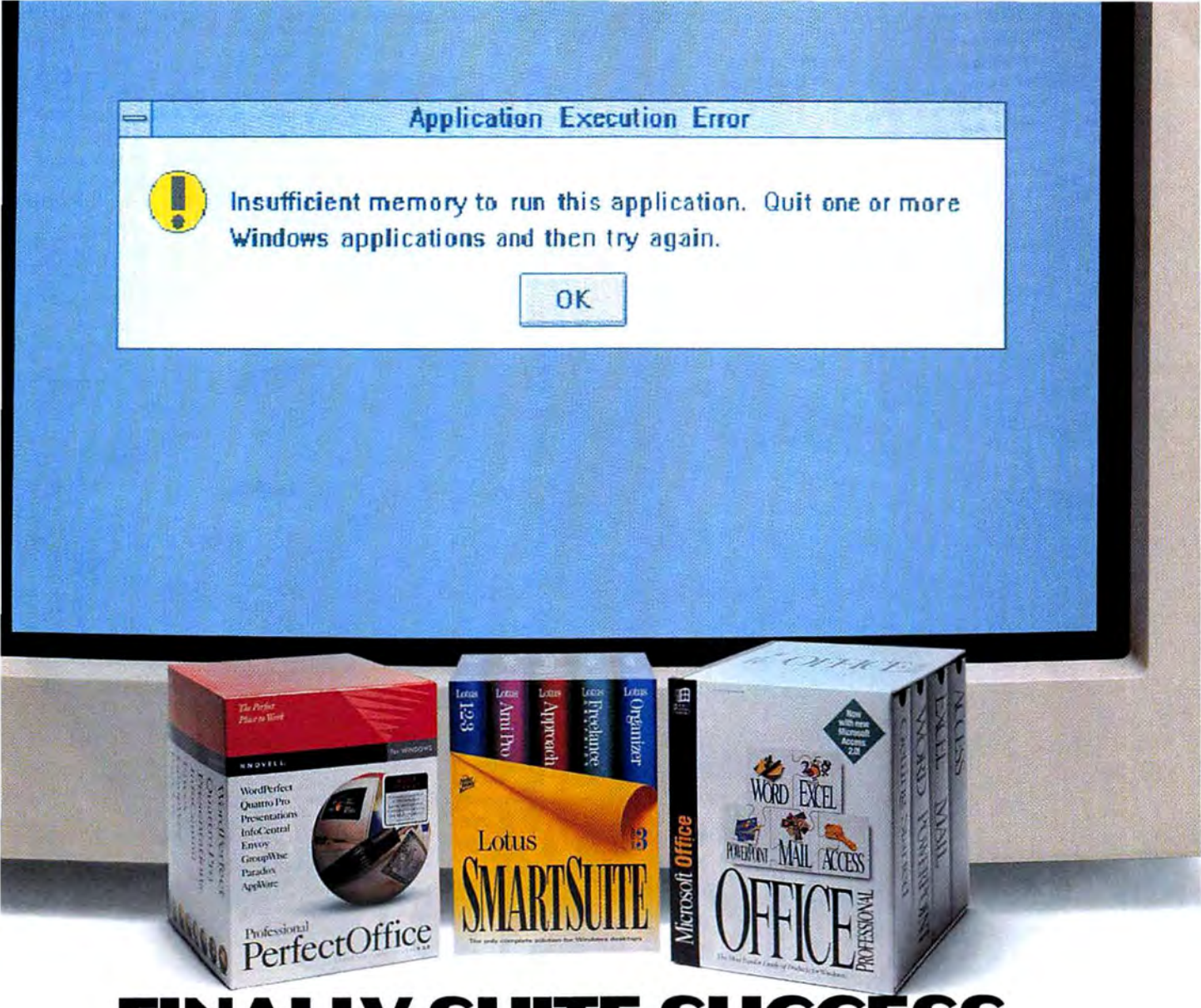
[3] Mouse port doubles as keyboard port.

[4] Port replicator available.

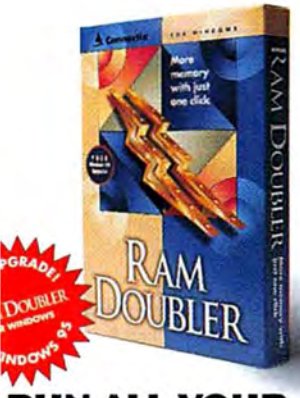
[5] Type III slot alternatively accepts two Type II devices.

[6] If system purchased through Compaq DirectPlus.

[7] Saturdays only.



FINALLY, SUITE SUCCESS.



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Completely Automatic- No Adjustments Required	✓			
Uses Third Generation Patented Technology	✓			
Increases System Resources	✓	✓		
Fixes Memory Below 1MB	✓	✓		
Uses Compression To Double Application Memory Space	✓	✓	✓	✓
Doesn't Modify Autoexec.bat Or Config.sys.	✓			✓

Buy RAM Doubler today wherever fine computer products are sold (SRP $99). It comes with a 30 day money back guarantee and lets you run all your applications at the same time. With RAM Doubler suite success has never been easier!

Connectix

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SYSTEM REQUIREMENTS: A PC equipped with a 386, 486, Pentium or equivalent processor. Windows 3.1 or 3.11, Windows for Workgroups 3.1 or 3.11, running in 386 enhanced mode. 4 MB RAM required, 8 MB RAM recommended. RAM Doubler for Windows works in tandem with any DOS memory extender, such as QEMM or Netroom. © 1995 Connectix Corporation. 2655 Campus Drive, San Mateo, CA 94403 USA. 800-839-3628 • 415-571-5100 • FAX 415-571-5195. RAM Doubler is a trademark of Connectix Corporation. All other trademarks are the property of their respective holders.

HUNGRY FOR ARCADE QUALITY 3D GAMING ON YOUR PC?

Includes two exciting 3D games free!

It's feeding frenzy time! Paradise introduces Tasmania 3D, the accelerated 3D game board and game combo that has your existing gameplay for lunch. Tasmania 3D supports all RPA-compatible games to deliver the most visually electrifying games you've ever experienced on a PC. Incredibly high resolution, arcade-quality games—we're talking uncharted waters, here.

Craving 3D? Tasmania 3D's advanced 3D acceleration features, like texture mapping, Gouraud shading and Z-buffering, provide high-quality detail and smooth contours for an amazing 3D effect. All without sacrificing performance. Installation's a snap, since everything you need to install the board and game combo is in the box. And with Tasmania 3D's easy integration, you don't have to replace your graphics card. Best of all, Tasmania 3D is backed by the same 5-year warranty covering all Paradise performance products. Set a course for Tasmania at the retailers below and sink your teeth into killer gaming!

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COMPUTER CITY 1-800-THE-CITY

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PARADISE® Western Digital Corporation

Samsung SENS800

PROS: Good price for P-75, 16MB RAM, nice keyboard layout

CONS: Short battery life, no toll-free support

You get 16MB RAM, a 344MB hard drive, and a big color-active screen, but the battery life is short at under 3 hours. $3375. *Samsung, 800/316-9914* **Reader service no. 884**

WinBook XP DX4-75

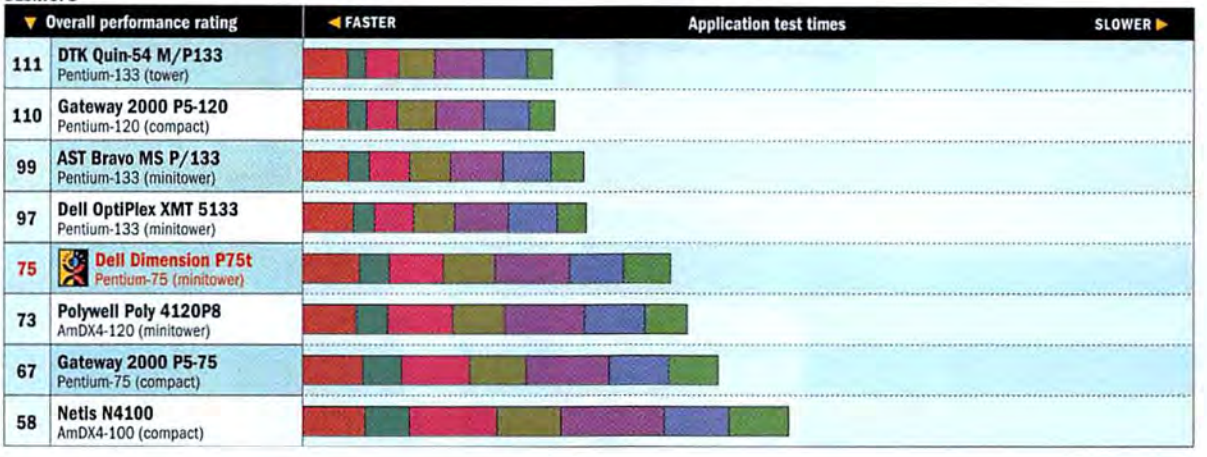
PROS: Active-matrix screen, variety of pointing-device options

CONS: Mediocre performance, no voice software for the 14.4-kbps voice fax-modem, one-year warranty

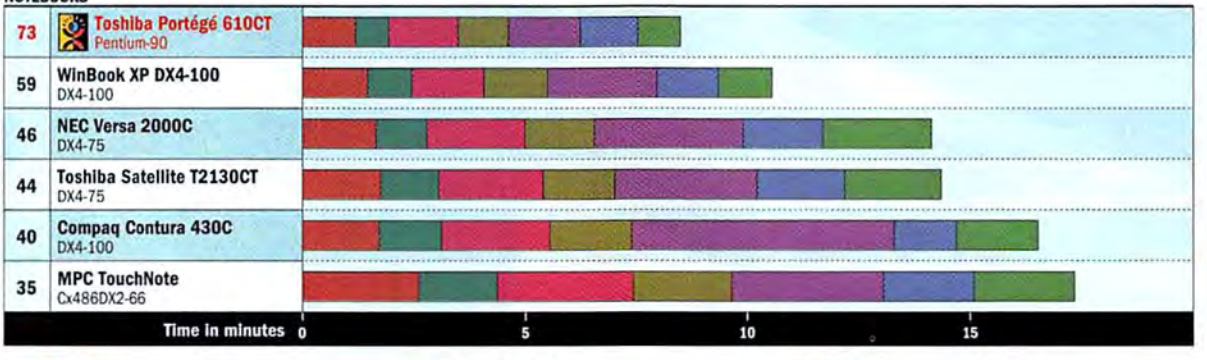
This 7.4-pound DX4-75 note has an active-matrix color screen, a comfortable keyboard, and a choice of pointing devices (a trackpoint is standard; a touchpad or trackball is optional—this unit came with the touchpad). You get 8MB of RAM, a 528MB hard disk, a modem, and stereo sound. The battery life of just over 4.5 hours is competitive, but it's not enough to put this slowpoke on our chart. $3459. *WinBook Computer, 800/468-2162* **Reader service no. 885**

TEST REPORT This Month's Contenders

DESKTOPS



NOTEBOOKS



BEST BUY

Systems are arranged in order of overall performance from best to worst, based on the normalized, weighted scores from seven tests. A system may have a better overall performance rating than another system that took less time to complete our test suite.

Methodology

We tested each system as supplied by the manufacturer, using the version of DOS supplied. If we installed Windows, we used the default installation. We configured Windows with an HP LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. We set video resolution to 800 by 600 pixels in 256 colors using the supplied video driver where possible. We loaded the test applications and files and test automation software and scripts.

Word 2.0 for Windows

We worked with 1-, 9-, and 28-page business documents. Operations included creating, saving, opening, scrolling, editing, checking spelling, formatting, previewing, and printing.

Excel 4.0

We opened a file and performed several data extracts, entered new data, altered calculations, formatted, scrolled, moved blocks, previewed, printed, and saved.

Paradox 1.0 for Windows

We used a custom form to add a moderate number of records to an existing table, performed several queries, and generated a report.

Freelance 1.0 for Windows

We built a six-page presentation using a standard template, clip art, text, and charts; applied several views to the presentation; then previewed and saved it.

WordPerfect 6.0 for DOS

We performed a variety of editing, formatting, previewing, and printing tasks on documents ranging from a single-page memo to a long report. Due to memory requirements, the amount of free memory for DOS in the first 640K dramatically affects this test.

1-2-3 release 3.4 for DOS

Using the graphical Wysiwyg add-in and working in three different files, we created and altered formulas, built graphs, saved, and printed.

Paradox 3.5 for DOS

We tested Paradox 3.5 running under Windows in a DOS window. We entered data, searched records, updated, and generated reports from a simple customer list.

Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

TALK

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What Could You Do With The Laser Printer For Windows

Adobe PostScript

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TEXAS INSTRUMENTS

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RELIABILITY AND SERVICE MONITOR

Win a Dell Dimension P75t

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Dell Dimension P75t, a Best Buy Pentium-75 PC in this month's Top 20.

HOW TO ENTER: FOR BEST RESULTS, PHOTOCOPY THIS PAGE, DO NOT TEAR IT OUT. Fax your completed questionnaire to *PC World* at 415/357-4522. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 12-SS, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by December 31.

PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact prize winners at the telephone and fax numbers they provide. If *PC World* is unable to do so within 30 days of the drawing, a substitute winner will be selected. No purchase necessary. Void where prohibited by law.

HOW TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER — —

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

How did you get this copy of *PC World*?

○ By subscription ○ On the newsstand ○ From someone else

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

○ Acer ○ Acma ○ ALR ○ Apple ○ AST ○ AT&T ○ Austin (IPC) ○ Axik ○ Blackship ○ Canon ○ Compaq ○ CompuAdd
○ Compudyne ○ Computrend ○ Comtrade ○ Cornell ○ CTX ○ Dell ○ Diamond ○ Digital (DEC) ○ DTK ○ EPS ○ Epson ○ Everex
○ Future Tech ○ Gateway 2000 ○ Hewlett-Packard ○ HiQ ○ Hyundai ○ IBM ○ Insight ○ Intelesys ○ Leading Edge ○ Micro Express ○ Micron ○ Midwest Micro
○ MIS ○ NEC ○ Netis ○ Packard Bell ○ Panasonic ○ PerComp ○ Pionex ○ Polywell ○ Quantex ○ Robotech ○ Samsung ○ Sharp
○ Swan ○ Tangent ○ Texas Instruments ○ Toshiba ○ Twinhead ○ USA Flex ○ VTech (Expotech, Laser) ○ WinBook ○ Zenith (ZDS) ○ Zenon ○ Zeos ○ Other

What size is this PC?

○ Desktop ○ Notebook/laptop ○ Handheld

What is the CPU?

○ PowerPC ○ Pentium ○ 80486 ○ 80386 ○ Other

Where did you buy this PC?

○ Local dealer ○ Mail/phone order ○ Direct from field sales force ○ Membership discount store ○ Computer superstore ○ Home electronics store ○ Retail store ○ Value-added reseller ○ Other

After ordering, how long did it take to get your PC?

○ Less than 1 week ○ 1–2 weeks ○ 3–4 weeks ○ More than 4 weeks

Who set up your PC?

○ Dealer/retailer/VAR ○ Staff computer technician ○ Self or coworker

WHEN YOU FIRST GOT YOUR PC

When did you buy this PC? (Specify month and year.)

○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec
○ 90 ○ 91 ○ 92 ○ 93 ○ 94 ○ 95

When you first set up your PC, were any components "dead on arrival" (DOA)?

○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)

○ Battery ○ CD-ROM ○ CPU ○ Floppy drive ○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory ○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse ○ Power supply ○ Sound board ○ Other

Did your problem occur only after you added your own hardware or software?

○ Yes ○ No ○ Don't know

Would you buy this brand of PC again?

○ Yes ○ No ○ Not sure

How many times have you had a problem with this PC?

○ No problem ever ○ One ○ Two ○ Three ○ Four ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Please answer for the most recent problem—*other than DOA*—not reported in a previous survey.

When did this problem occur? (Specify month and year.)

○ Jan ○ Feb ○ Mar ○ Apr ○ May ○ June ○ July ○ Aug ○ Sept ○ Oct ○ Nov ○ Dec
○ 90 ○ 91 ○ 92 ○ 93 ○ 94 ○ 95

How long was this after you purchased your PC?

○ Less than 1 month ○ 1–3 months ○ 4–6 months ○ 7–12 months ○ More than 12 months ○ Not sure

Did the problem occur as a result of adding new hardware or software?

○ Yes ○ No ○ Don't know

Did the problem occur under warranty?

○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)

○ Faulty component ○ Incorrectly installed software ○ Wrong configuration ○ Faulty peripheral ○ Device conflicts ○ OS problem ○ Other ○ Don't know

If a component failed, which one was it? (Mark all that apply.)

○ Battery ○ CD-ROM ○ CPU ○ Floppy drive ○ Graphics/video board ○ Hard drive ○ Keyboard ○ Memory ○ Modem/fax board ○ Monitor/screen ○ Motherboard ○ Mouse ○ Power supply ○ Sound board ○ Other

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your PC?

○ Manufacturer ○ Dealer/store where purchased ○ Manufacturer's authorized repair technician ○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)

○ Phone ○ On site ○ In store ○ System swap ○ Component swap ○ Factory return

If you received phone service, how long were you on hold?

○ Not at all ○ Less than 1 minute ○ 1–2 minutes ○ 3–5 minutes ○ 6–10 minutes ○ 11–20 minutes ○ More than 20 minutes

How long did it take before you talked to the person who finally helped you?

○ Less than 15 minutes ○ 15 minutes–1 hour ○ 2–5 hours ○ 6–10 hours ○ 11–24 hours ○ 1½–2 days ○ 3–5 days ○ 1 week or more

How long did it take to resolve the problem completely?

○ 1–2 days ○ 3–7 days ○ 8–14 days ○ 15–30 days ○ More than 1 month ○ Never resolved ○ Awaiting resolution

Was the problem resolved to your satisfaction?

○ Yes ○ No

How would you rate the person(s) who helped you?

	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of PC again?

○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?

○ Not at all ○ ○ ○ Satisfied ○ ○ Extremely satisfied

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Finally. DiamondTron™, the world's most technologically advanced tube, is now available in a 17" (16.0" viewable area), and we've made it affordable. **It's the CTX 17XA color monitor!**

YOU GET a DiamondTron cylindrical, vertically flat, square-cornered display with an aperture grille mask design, along with a unique electron gun that delivers resolutions up to 1600 x 1200. And, an ultra-fine 0.25mm aperture grille pitch for PC, Mac, SUN and SPARC systems.

YOU GET incredible precision and clarity from center to corner, edge-to-edge, for dazzling colors and distortion-free images.

YOU GET unique features, like our On-Screen-Display (OSD) for convenient on-screen programming. And the SuperStar™ Power Management System (CPMS) that far exceeds Energy Star™ guidelines. The CTX 17XA also meets TCO standards, which lower energy and harmful electromagnetic emissions.

YOU GET a limited three-year warranty* on parts and labor. PLUS the monitor is Plug and Play† compatible for Windows® 95.

YOU GET IT ALL... the CTX 17XA monitor... something to drool over.

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Making Technology Affordable

Best Buy — 1765GMe Monitor June 1995

PC Magazine Editors' Choice — 1765GMe Monitor September 1995

PC World — 1785GM Monitor March 1995

MacUser — 1785GM Monitor May 1995

National Sales: 800-289-8808 • FasFax: 818-837-4341, Acct. No. 026
Eastern Region: 201-646-0707 • Southern Region: 404-729-8909 • Western Region: 909-598-8094

* Two year warranty on CRT. † Requires a DDC compatible video card. © 1995, CTX International, Inc.
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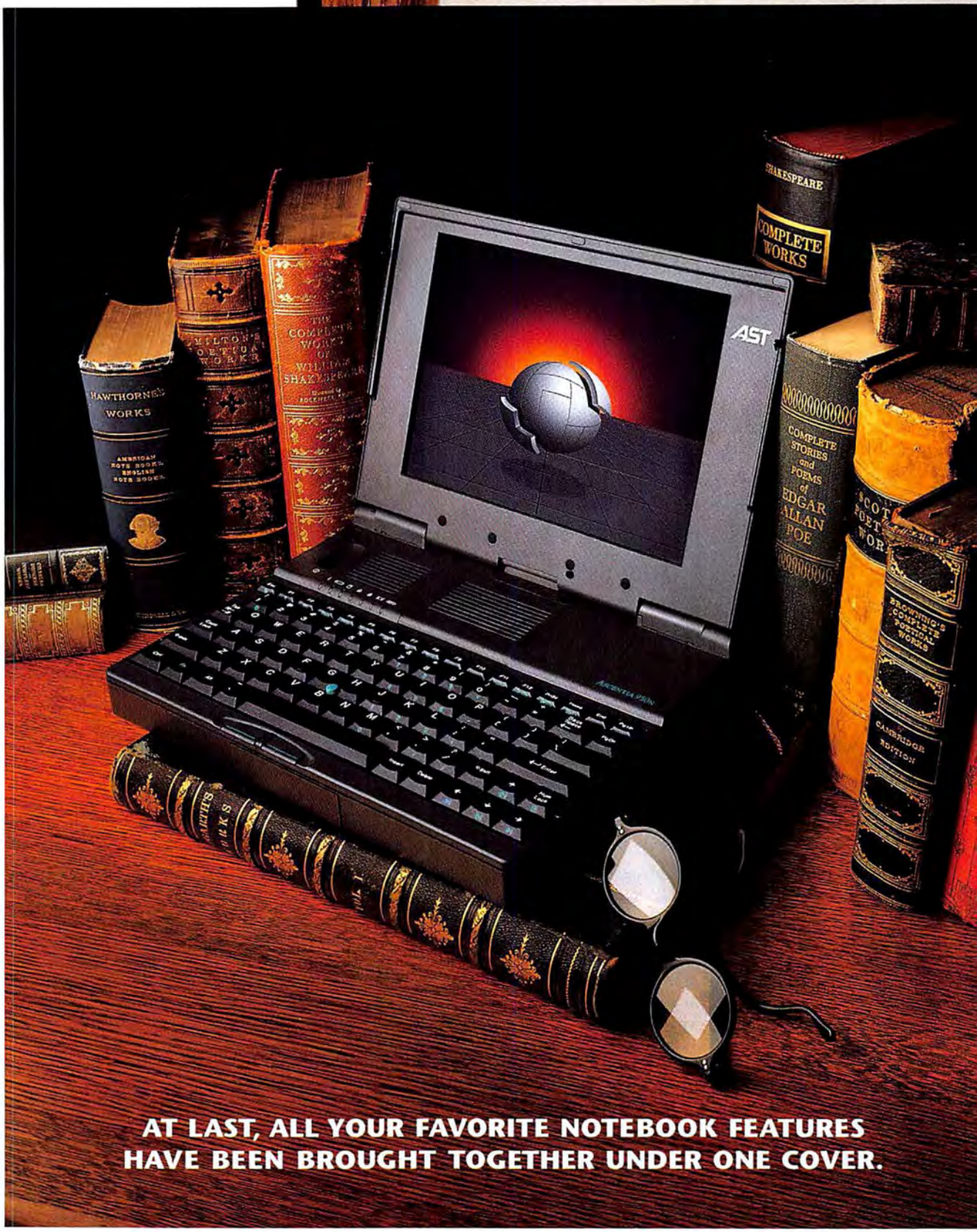
Circle 74 on reader service card

You've seen performance notebooks with this featu
Or that feature. But everything? Well, complete only beg
to describe the Ascentia™ 950N.

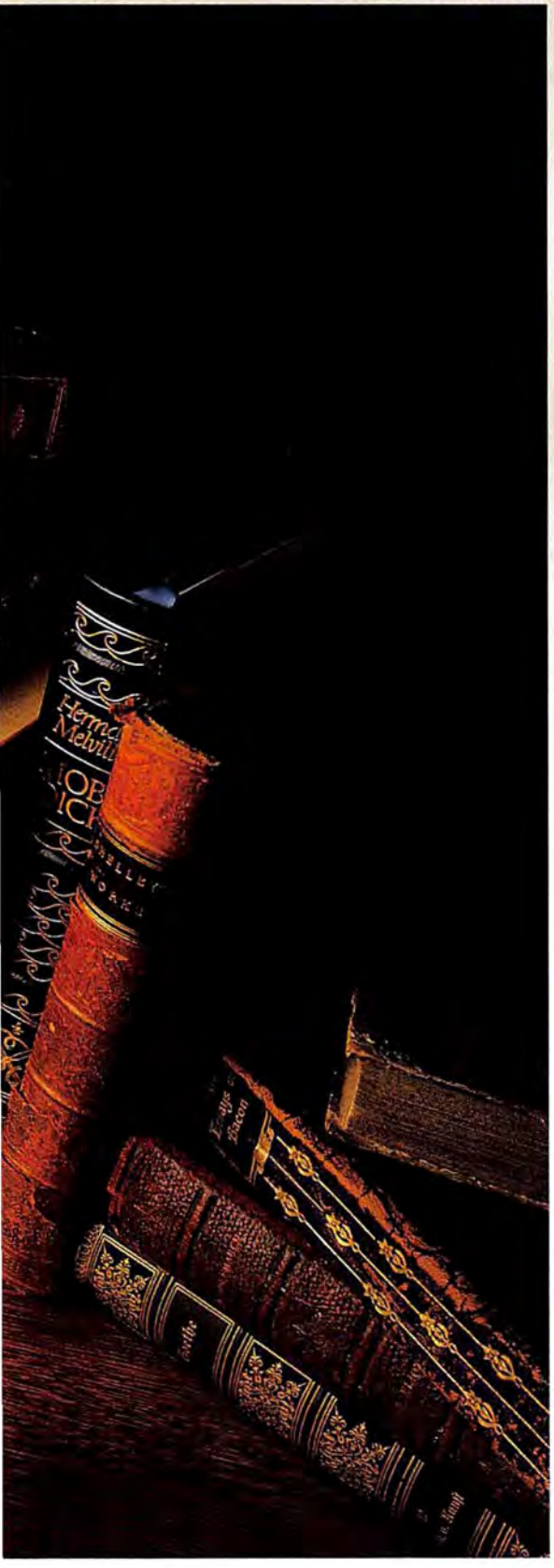
First, there's the 120 MHz Intel® Pentium processor. It's



AT LAST, ALL YOUR FAVORITE NOTEBOOK FEATURES HAVE BEEN BROUGHT TOGETHER UNDER ONE COVER.

e power you need to run the most demanding software. me notebooks are great for memos. This one is capable of nething more on the scale of *War and Peace*.

There's also a huge 11.8" Super VGA 800 x 600 resolution screen, in active-matrix TFT. You'll see 56% more of your document, which cuts down on panning and scrolling. In other words, you'll get the complete picture.



Your projects will sound better, too, with 16-bit Sound Blaster® features and an embedded speaker and microphone. So you can easily take a track off that new CD and drop in a video clip for impressive multimedia presentations.

And since we wouldn't want to interrupt the flow of the next great American novel or the quarterly sales report, there's a long-lasting Lithium Ion battery. Infrared technology for wireless printing and transferring of files? Got that, too.

intel inside
pentium PROCESSOR

Even the 3-year worldwide warranty* comes with round-the-clock telephone support and our ExeCare℠ 48-hour rapid repair service.**

THE COMPLETE PENTIUM NOTEBOOK

Processor:
120, 90 or 75 MHz Pentium, 256 KB Level 2 Cache

RAM:
8 MB expandable to 40 MB

Screen:
11.8" (Diagonal) Super VGA 800 x 600 TFT or 10.4" (Diagonal) VGA TFT

Multimedia:
Sound Blaster 16-bit sound system

Hard Drives:
500 MB, 800 MB or 1.2 GB

Battery:
Lithium Ion, for up to 6 hours

Weight:
6.2 pounds

For more information on the Ascentia 950N's abundant features and a reseller near you, call 800-876-4AST. We can even fax back the information. Yes, we've thought of everything.

AST® COMPUTER

Circle 87 on reader service card

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NOTEBOOK RELIABILITY AND SERVICE MONITOR

Win an Austin StepLite DX4/75

Have you ever contacted your notebook maker for service and support? Or has your notebook been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Best Buy Austin StepLite DX4/75.

HOW TO ENTER: FOR BEST RESULTS, PHOTOCOPY THIS PAGE, DO NOT TEAR IT OUT. Fax your completed questionnaire to *PC World* at 415/357-4522. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 12-NB, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by December 31.
PRIZE: One entry per person. IDG employees and their families are not eligible. One prize will be awarded through a random drawing. *PC World* will make reasonable efforts to contact prize winners at the telephone and fax numbers they provide. If *PC World* is unable to do so within 30 days of the drawing, a substitute winner will be selected. No purchase necessary. Void where prohibited by law.
HOW TO FILL OUT THE FORM: Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME

FAX NUMBER

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

How did you get this copy of *PC World*?
○ By subscription ○ On the newsstand ○ From someone else

ABOUT YOUR NOTEBOOK

Who is the manufacturer of your notebook?

○ Acer	○ BSI	○ EPS	○ MPC	○ Texas Instruments
○ Acma	○ Canon	○ Epson	○ NEC	○ Toshiba
○ Acom	○ Compaq	○ Ergo	○ Packard Bell	○ Tri-Star
○ ALR	○ CompuAdd	○ Everex	○ Panasonic	○ Twinhead
○ AMS	○ Compudyne	○ Future Tech	○ Pionex	○ USA Flex
○ Apple	○ Comtrade	○ Gateway 2000	○ Samsung	○ WinBook
○ ARM	○ CTX	○ Hewlett-Packard	○ Sceptre	○ Zenith (ZDS)
○ Aspen	○ Dell	○ Hyundai	○ Sharp	○ Zenon
○ AST	○ DFI	○ IBM	○ Swan	○ Zeos
○ AT&T	○ Digital (DEC)	○ Micro Express	○ Tadpole	○ Other
○ Austin	○ DTK	○ MidWest Micro	○ Tandy	
○ Axik	○ Duracom	○ Mitac	○ Tangent	

What size is this portable?
○ Notebook/laptop
○ Handheld

What is the CPU?
○ Pentium
○ 80486
○ 80386
○ Macintosh
○ Other

Where did you buy this notebook?
○ Local dealer
○ Mail/phone order
○ Direct from field sales force
○ Membership discount store
○ Computer superstore
○ Home electronics store
○ Retail store
○ Value-added reseller
○ Other

After ordering, how long did it take to get your notebook?
○ Less than 1 week
○ 1–2 weeks
○ 3–4 weeks
○ More than 4 weeks

Who set up your notebook?
○ Dealer/retailer/VAR
○ Staff computer technician
○ Self or coworker

WHEN YOU FIRST GOT YOUR NOTEBOOK

When did you buy this notebook? (Specify month and year.)

○ Jan	○ Mar	○ May	○ July	○ Sept	○ Nov	○ 90	○ 92	○ 94
○ Feb	○ Apr	○ June	○ Aug	○ Oct	○ Dec	○ 91	○ 93	○ 95

When you first set up your notebook, were any components "dead on arrival" (DOA)?
○ Yes ○ No ○ Don't know

If so, which component was it? (Mark all that apply.)

○ AC adapter	○ Floppy drive	○ Modem/fax board	○ Screen
○ Battery	○ Hard drive	○ Motherboard	○ Other
○ CPU	○ Keyboard	○ PC Card slot	
○ Docking station	○ Memory	○ Pointing device	

Did your problem occur only after you added your own hardware or software?
○ Yes ○ No ○ Don't know

Would you buy this brand of notebook again?
○ Yes ○ No ○ Not sure

How many times have you had a problem with this notebook?
○ No problem ever ○ Three
○ One ○ Four
○ Two ○ More than four

If you have had a problem that you have not reported in a previous survey, please fill out the right column. If you are reporting a DOA for the first time, skip to the service section.

NEW PROBLEM REPORT

Please answer for the most recent problem—*other than DOA*—not reported in a previous survey.

When did this problem occur? (Specify month and year.)

○ Jan	○ Mar	○ May	○ July	○ Sept	○ Nov	○ 90	○ 92	○ 94
○ Feb	○ Apr	○ June	○ Aug	○ Oct	○ Dec	○ 91	○ 93	○ 95

How long was this after you purchased your notebook?
○ Less than 1 month ○ 4–6 months ○ More than 12 months
○ 1–3 months ○ 7–12 months ○ Not sure

Did the problem occur as a result of user mishandling?
○ Yes ○ No ○ Don't know

Did the problem occur under warranty?
○ Yes ○ No ○ Don't know

What was the problem finally identified as? (Mark all that apply.)
○ Faulty component ○ Wrong configuration ○ Device conflicts ○ Other
○ Incorrectly installed software ○ Faulty peripheral ○ OS problem ○ Don't know

If a component failed, which one was it? (Mark all that apply.)

○ AC adapter	○ Floppy drive	○ Modem/fax board	○ Screen
○ Battery	○ Hard drive	○ Motherboard	○ Other
○ CPU	○ Keyboard	○ PC Card slot	
○ Docking station	○ Memory	○ Pointing device	

SERVICE

Please use this section to describe the service and support you received for the problem reported above or the DOA reported at left.

Who fixed your notebook?
○ Manufacturer
○ Dealer/store where purchased
○ Manufacturer's authorized repair technician
○ Self ○ Other

What types of service and support did you receive? (Mark all that apply.)
○ Phone ○ System swap
○ On site ○ Component swap
○ In store ○ Factory return

If you received phone service, how long were you on hold?
○ Not at all ○ 1–2 minutes ○ 6–10 minutes ○ More than 20 minutes
○ Less than 1 minute ○ 3–5 minutes ○ 11–20 minutes

How long did it take before you talked to the person who finally helped you?
○ Less than 15 minutes ○ 2–5 hours ○ 11–24 hours ○ 3–5 days
○ 15 minutes–1 hour ○ 6–10 hours ○ 1½–2 days ○ 1 week or more

How long did it take to resolve the problem completely?
○ 1–2 days ○ More than 1 month
○ 3–7 days ○ Never resolved
○ 8–14 days ○ Awaiting resolution
○ 15–30 days

Was the problem resolved to your satisfaction?
○ Yes ○ No

How would you rate the person(s) who helped you?

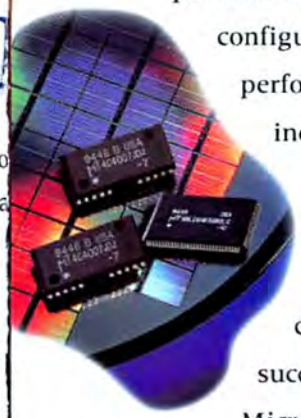
	Poor		Good		Excellent
Courtesy	○	○	○	○	○
Knowledge	○	○	○	○	○
Follow-through	○	○	○	○	○

Based on the service and support you received, would you buy this brand of notebook again?
○ Yes ○ No

On the whole, how satisfied are you with the service and support you received?
○ Not at all ○ ○ ○ Satisfied ○ ○ Extremely satisfied

PLEASE FAX TO 415/357-4522. FOR BEST RESULTS, PHOTOCOPY THIS PAGE.

The Micron PC product family includes a line of high-performance, memory-intensive personal computer systems, configured to optimize performance and to incorporate the latest features in PC technology. A measure of competitive success of Micron PC systems is evidence in over 40 awards received from personal computer trade publications from 1993 to present, including Editors' Choice Awards from PC Magazine, Best Buy Awards from PC World magazine, and Analyst's Choice Awards from PC Week magazine. And through relationships with Intel, Novell, and Microsoft, you can be assured that Micron delivers some of the most tightly integrated system solutions and the widest range of system configurations available anywhere.



yes NetWare Tested and Approved

Designed for Microsoft® Windows®95

intel inside pentium

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http://www.mei.micron.com

MICRON ELECTRONICS, INC.

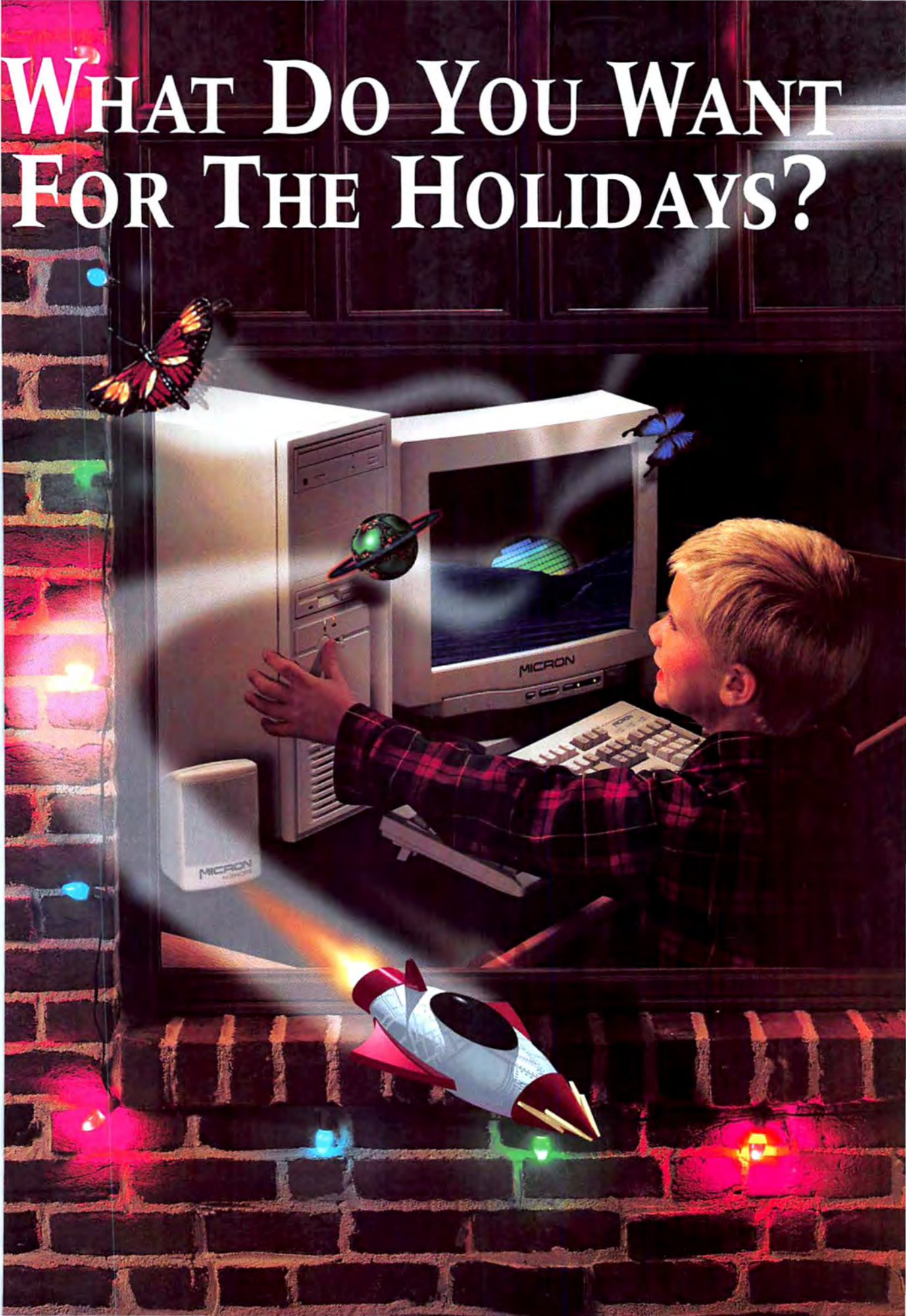
THE BEST PC

"The Millennia is nothing short of the best all-around PC available on the market today." PC Magazine, April 25, 19

With 133MHz of screaming Pentium® processor horsepower, Micron's new P133 Millennia races far ahead of all established benchmarks into a whole new universe of unbridled computing performance. And with new memory technologies like EDO memory and pipelined burst cache, this proven champion is optimized to perfection. The P133 Millennia is ready to run any application you want. Right now! There's no stopping the Micron Millennia. So what's stopping you?

PC MAGAZINE EDITORS' CHOICE May 30, 1995 P120 MILLENN

WHAT DO YOU WANT FOR THE HOLIDAYS?



ONEY CAN BUY

P133 MILLENNIA

- Intel 133MHz Pentium processor
- 256K pipelined burst cache, flash BIOS
- 4X EIDE CD-ROM drive, 3.5" floppy drive
- SoundBlaster™ 16 stereo sound & speakers
- PCI 64-bit graphics accelerator (2MB)
- *Tool-free* mini-tower or desktop
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows® 95 CD

A • 8MB EDO RAM • 850MB EIDE hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
• Microsoft Works 95 CD
$2,399 Business Lease $86/month

B • 16MB EDO RAM • 1.2GB EIDE hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
• Microsoft Office Pro 95 & Bookshelf 95 CDs
$2,899 Business Lease $103/month

C • 32MB EDO RAM • 1.6GB EIDE hard drive
• 17" Micron 17FGx, 1280NI, .26mm monitor
• Microsoft Office Pro 95 & Bookshelf 95 CDs
$3,899 Business Lease $133/month

- With 120MHz Pentium processor.....subtract $100
- With 100MHz Pentium processor.....subtract $200

P133 MILLENNIA PLUS

- Intel 133MHz Pentium processor
- 256K pipelined burst cache, flash BIOS
- PCI 32-bit Ultra SCSI Fast-20 controller
- 6X SCSI-2 CD-ROM drive, 3.5" floppy drive
- SoundBlaster 16 stereo sound & speakers
- PCI 64-bit graphics accelerator (2MB)
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs

A • 16MB EDO RAM • 1GB Fast SCSI-2 hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
$3,299 Business Lease $112/month

B • 32MB EDO RAM • 2GB Fast SCSI-2 hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
$4,299 Business Lease $147/month

C • 64MB EDO RAM • 4GB Fast SCSI-2 hard drive
• 17" Micron 17FGx, 1280NI, .26mm monitor
$6,299 Business Lease $206/month

Exceptional speed, performance and reliability are just a few of the reasons why Micron is a technology leader in PC design. From the ultra-powerful and award-winning PowerStation, to the P266 PowerServer SMP, Micron offers a complete range of dependable products to suit every need. So when you're considering your next PC purchase, consider how much you'll get in a Micron PC.

P100 POWERSTATION

- Intel 100MHz Pentium processor
- 256K write-back cache, flash BIOS
- 4X EIDE CD-ROM drive, 3.5" floppy drive
- SoundBlaster 16 stereo sound & speakers
- PCI 64-bit graphics accelerator (2MB)
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 CD

A • 8MB EDO RAM • 850MB EIDE hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
• Microsoft Works 95 CD
$1,999 Business Lease $71/month

B • 16MB EDO RAM • 1.2GB EIDE hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
• Microsoft Office Pro 95 & Bookshelf 95 CDs
$2,499 Business Lease $89/month

- With 75MHz Pentium processor....subtract $100

P75 POWERSTATION LX

- Intel 75MHz Pentium processor
- 256K write-back cache, flash BIOS
- 8MB EDO RAM • 850MB EIDE hard drive
- 3.5" floppy drive
- PCI 64-bit graphics accelerator (1MB)
- 14" Micron 14FGx, 1024, .28mm monitor
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95
- Microsoft Works 95

$1,499 Business Lease $54/month

- With 100MHz Pentium processor.....add $100

Micron computers are winning critical acclaim for their exceptional quality, record-breaking speeds, dependable performance, and outstanding customer service and technical support. Selected five times as PC Magazine's "Editor's Choice" and named "Best Buy" by PC World on over 30 occasions, Micron computers have also been the recipient of three CADalyst "Highly Recommended" awards, a Windows Sources "Expert's Pick", and a PC Week Lab's "Analyst's Choice" award. In addition to these prestigious titles, Micron also received the highest scores in PC Magazine's Service and Reliability survey in the categories of Satisfaction with Reliability, Satisfaction with Repair Experience, Satisfaction with Technical Support, and Future Likelihood of Buying Again.

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MICRON ELECTRONICS, INC.

P133 POWERSERVER SMP

- Intel 133MHz Pentium® processor
- Dual Pentium SMP ZIF sockets
- 512K write-back cache, flash BIOS
- Slots: 5 EISA, 2 PCI, 1 EISA/PCI
- PCI 32-bit Ultra SCSI Fast-20 controller
- 4X SCSI-2 CD-ROM drive, 3.5" floppy drive
- PCI 64-bit graphics accelerator (2MB)
- Full-size tower with 10 drive bays
- Microsoft® Mouse, 104-key keyboard
- Microsoft Windows® 95 CD

A • 16MB RAM • 1GB SCSI-2 hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
$3,799 Business Lease $130/month

B • 32MB RAM • 2GB SCSI-2 hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
$4,799 Business Lease $164/month

- With second 133MHz Pentium processor.....add $799
- With Windows NT Workstation 3.51 CD.....add $249

P266 POWERSERVER SMP

- Dual 133MHz Pentium processors
- 512K write-back cache, flash BIOS
- Slots: 5 EISA, 2 PCI, 1 EISA/PCI
- PCI 32-bit Ultra SCSI Fast-20 controller
- 6X SCSI-2 CD-ROM drive, 3.5" floppy drive
- PCI 64-bit graphics accelerator (2MB)
- Full-size tower with 10 drive bays
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows NT Workstation 3.51 CD

MICROSOFT WINDOWS NT READY-TO-RUN

A • 32MB RAM • 2GB SCSI-2 hard drive
• 15" Micron 15FGx, 1280NI, .28mm monitor
$5,499 Business Lease $180/month

B • 64MB RAM • 4GB SCSI-2 hard drive
• 17" Micron 17FGx, 1280NI, .26mm monitor
$7,499 Business Lease $245/month

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Redefine the meaning of work and play. The Micron Home MPC presents the most complete multimedia experience in a single package.

Designed for Microsoft® Windows®95

P133 HOME MPC PRO

- Intel 133MHz Pentium® processor
- 256K pipelined burst cache, flash BIOS
- 16MB EDO RAM • 1.2GB EIDE hard drive
- 4X EIDE CD-ROM drive, 3.5" floppy drive
- SoundBlaster™ 16 stereo sound & speakers
- 14.4 fax/modem, speakerphone, voice mail
- PCI 64-bit graphics accelerator (2MB)
- 17" Micron 17FGx, 1280NI, .26mm monitor
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 CD
- Microsoft Office Pro 95 & Bookshelf 95 CDs
- *Microsoft Scenes: Sports Extremes; Microsoft Bob™ CD; Microsoft Encarta™ 95 CD; Quicken® Deluxe Edition CD; Microsoft Dangerous Creatures CD; Microsoft Golf Multimedia CD; Trial subscriptions for Compuserve™, Prodigy™ and America On-Line™.*

$3,299

PC MAGAZINE EDITORS' CHOICE
May 16, 1995
P90 HOME MPC

PC WORLD WORLD CLASS 1995
July 1995
P90 HOME MPC

intel inside pentium

P75 HOME MPC

- Intel 75MHz Pentium processor
- 256K write-back cache, flash BIOS
- 8MB EDO RAM • 850MB EIDE hard drive
- 4X EIDE CD-ROM drive, 3.5" floppy drive
- SoundBlaster 16 stereo sound & speakers
- 14.4 fax/modem, speakerphone, voice mail
- PCI 64-bit graphics accelerator (2MB)
- 15" Micron 15FGx, 1280NI, .28mm monitor
- *Tool-free* mini-tower or desktop
- Microsoft Mouse, 104-key keyboard
- Microsoft Windows 95 CD
- Microsoft Works 95 CD
- *Microsoft Scenes: Sports Extremes; Microsoft Bob CD; Microsoft Encarta 95 CD; Quicken Deluxe Edition CD; Microsoft Dangerous Creatures CD; Microsoft Golf Multimedia CD; Trial subscriptions for Compuserve, Prodigy and America On-Line.*

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- With 100MHz Pentium processor.....add $100

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HP DeskJet 850C: A Color Printer Even Scrooge Would Love

Passes With Flying Colors: ***Excellent color output helped Hewlett-Packard's new top-of-the-line personal color ink jet, the DeskJet 850C, earn a Best Buy.***

Whether Scrooge or Cratchit rules your budget, the printers available this holiday season come with prices and capabilities to satisfy everyone.

Four newcomers made the chart this month. The HP DeskJet 850C, our new color Best Buy, is expensive at $529; but with 600-dpi monochrome and 300-dpi color resolutions, its output is the best we've seen from an ink jet.

Two lasers—Okidata's fancy OL810e and Panasonic's slim KX-P6100—land on the monochrome chart below our Best Buy, the 300-dpi NEC SuperScript 610plus. If its $399 price isn't low enough already, at press time NEC announced a $100 rebate on the 610plus through January 14, 1996.

Canon and Epson are introducing new products this season, but they couldn't send us review units by our deadline. Watch this space for reviews of the new generation—including models that replace Canon's BJC-600e and Epson's Stylus Color, October's top two color ink jets.

Panasonic Nudges NEC

The new number-two printer on our monochrome list, the 300-dpi Panasonic KX-P6100 is fast, affordable at $399, and has good print quality. The Panasonic's vertical minitower design saves space. The paper feed and output trays you open for printing add about 8 inches to the width, but they leave ample clearance underneath for low-lying desktop items.

Frugal Scrooges may not like the $777 tag on the fifth-ranked Okidata OL810e; but it and the Panasonic are the fastest printers we've tested, and the Okidata offers somewhat high-end features for a personal printer: 2MB of RAM for large text files, an 8-page-per-minute engine, and available paper options for loading up to 850 sheets and 50 envelopes.

TOP 10 PERSONAL PRINTERS

		Last ranking	First reviewed	Type	Street price [1]	Overall rating	Output rating		Speed rating		Features, ease-of-use rating	Reader service number	Comments
							Monochrome	Color	Monochrome	Color			
MONOCHROME	1 NEC SuperScript 610plus 800/632-4636	1	Aug 95	laser	$399	85	67	–	55	–	72	788	Fine text and graphics, fast, nice features.
	2 Panasonic KX-P6100 800/742-8086	–	current	laser	$399	83	65	–	58	–	65	789	Great graphics output, fast, good support.
	3 NEC SuperScript 660 800/632-4636	3	Aug 95	laser	$499	80	64	–	51	–	72	790	$100 price drop, good print quality, nice features.
	4 Brother HL-630 800/276-7746	2	Aug 95	laser	$389	80	50	–	53	–	75	791	Fast, average text and graphics, good support.
	5 Okidata OL810e 800/654-3282	–	current	laser	$777	79	62	–	58	–	68	792	Fastest of group, clean text, high-end features.
COLOR	1 HP DeskJet 850C 800/752-0900	–	current	ink jet	$529	77	50	70	29	29	77	793	Best color print quality and speed; pricey.
	2 Canon BJC-70 800/848-4123	3	Aug 95	ink jet	$359	76	50	50	35	26	81	794	Adequate print quality, fast monochrome speed.
	3 DECcolorwriter 550ic 800/777-4343	–	current	ink jet	$329	76	42	50	33	26	68	795	Bargain price, great service and support, fast.
	4 HP DeskJet 660C 800/752-0900	–	Oct 95	ink jet	$399	74	50	61	18	18	71	796	$89 price drop, good print quality, but slow.
	5 Lexmark WinWriter 150c 800/891-0331	5	Oct 95	ink jet	$349	71	51	50	18	13	68	797	Good output; slow color printing, poor support.

[1] Based on vendor estimates and PC World research.

BEST BUY **Methodology** To determine overall rating, we weight output quality and features (which includes hands-on testing) the most heavily, followed by price, support policies, performance, and consumables. For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

For more information about all products in this table, circle reader service no. 910.

Best Buy Challenger: ***Panasonic's KX-P6100 laser is a very fast monochrome printer, with some of the best output we've seen.***

Three monochrome printers didn't make the chart. Brother's new $499, 600-dpi WL-660 is nearly identical to the HL-660 reviewed in August, but this version is a far less-expensive Windows printer that uses Windows and your PC for page processing. Not surprisingly, it has better output than its sibling on the Top 10, the 300-dpi HL-630. It can't print from DOS or Macintosh apps, however. The Best Buy NEC SuperScript 610plus and the third-ranked SuperScript 660 are Windows printers too, but they can print directly from DOS.

The compact, 300-dpi Kyocera FS-400A is a good choice for big offices, with more connectivity options than most personal printers—LocalTalk, Ethernet and Token Ring—and PostScript Level 1 standard. But it couldn't finish our test suite with its standard 1MB of RAM. The 4MB RAM upgrade we installed added about $200 to the estimated street price. The Kyocera's gray-scale page had vertical banding and looked faded.

A 600-dpi monochrome ink jet, the HP DeskJet 600 is too slow to compete with the lasers. But it offers decent plain-paper print quality for a bargain $279 price. An optional cartridge turns the DeskJet 600 into a 300-dpi color printer (HP also sells the printer and color kit prepackaged as the DeskJet 600C for about $320). It can take only one cartridge at a time, so in color mode it prints a composite black that's inferior to true black, and when one color runs out, the whole cartridge is replaced.

Our new color Best Buy, the HP DeskJet 850C, is expensive for an ink jet, but it's fairly fast and gave us great output, even on plain paper. The 850C comes standard with both bidirectional parallel and LocalTalk ports for either a PC or a Mac. Both its design and documentation are tops for ease of use. HP is selling the same product under two names: The 850C will sell primarily to corporations, but in retail stores, for a slightly higher price, you'll see it as the 855C. The 855C will come with a Kodak Photo CD offer, good through April 1996: Send in your film with the supplied mailer, get back a Photo CD with the necessary software to run it on your CD-ROM drive, and use the 855C to print the images.

Leapfrogging the Lexmark Winwriter 150c, the HP DeskJet 660C appears at fourth place, thanks to an $89 price drop. First reviewed in October, it's slower than the 850C but almost on par in output quality.

Our new third-place color printer, the $329 DEC-colorwriter 550ic, replaces the 520ic we reviewed in August. Digital increased the monochrome resolution to 600 dpi. It gets a marginally better monochrome output score as a result, but color output improved considerably. Its printer driver is more sophisticated and easier to use, too. Unfortunately, the 550ic has the same one-cartridge design and the same pesky power button that requires excessive effort and finesse to turn on.

We tested one other color ink jet, the new Okidata Okijet 2010, which didn't make the chart. It prints on heavier stock that some printers don't handle well, and it has good print quality. But it's not very fast, and at $369 it's priced a little higher than the Lexmark Winwriter 150c it closely resembles.

—Bill Underwood

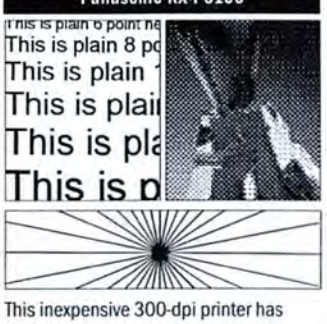
Printer testing was performed by Ulrike Diehlmann of the PC World Test Center.

OUTPUT QUALITY SAMPLES: Hewlett-Packard, Panasonic Have Some of the Best Yet

NEC SuperScript 610plus

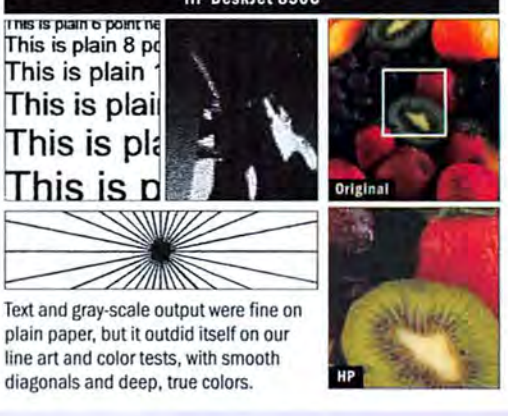
Our monochrome Best Buy for the third month running, it boasts especially good text. Its line art and gray-scale surpasses even some 600-dpi models.

Panasonic KX-P6100



This inexpensive 300-dpi printer has finely drawn text, a good gray-scale range, and excellent straightedge line art (curves were a bit uneven, however).

HP DeskJet 850C



Text and gray-scale output were fine on plain paper, but it outdid itself on our line art and color tests, with smooth diagonals and deep, true colors.

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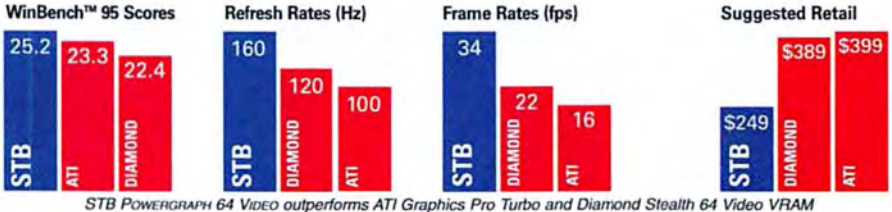

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Circle 210 on reader service card

Brand-Names Beat Out No-Names

Gateway Emerges
Gateway 2000's Vivitron 1572 is priced low for a Trinitron monitor, and the control button layout makes adjustments quick and easy.

Whose monitor should you buy when you purchase a PC: the monitor your PC vendor sells under its own name, or a brand-name model from a big manufacturer such as Sony?

To find out, we tested four 15-inch monitors that leading PC manufacturers bundle with their systems (and also sell separately): Compaq's 151FS, Gateway 2000's Vivitron 1572, IBM's P50, and Packard Bell's 1151SL. Our verdict: You're probably better off going with a brand name than a model branded over by a PC vendor. Only one branded unit—the Vivitron 1572—cracked our chart. No other monitor we tested this month could compete in display quality or controls.

The two best 15-inchers we've tested so far are still Princeton Graphic Systems' Ultra 15 and NEC's MultiSync XV15. The Ultra 15's bargain $350 price and reach-out-and-touch graphics quality can't be beat. For $110 more, NEC's MultiSync XV15 does a fine job with both text and graphics, and you get Level 1 Plug and Play to boot.

Debuting in ninth place, the Vivitron 1572 is affordable at $379, but it earned middling ratings for its display, despite its 0.26mm-stripe-pitch Trinitron design. Of the remaining monitors we tested this month, IBM's P50 came closest to earning a Top 10 berth. It's built with the same Trinitron tube as the Gateway 2000 unit, but it's $10 more, and our judges found its analog controls less intuitive than the Gateway 2000's for making fine adjustments.

ADI's MicroScan 4V LM-1564—usually sold with Micron PCs—now supports Level 2b Plug and Play, boosting it to seventh place. A $17 price hike to $598 helped knock Nanao's FlexScan F2-15 off the chart.

TOP 10
15-INCH MONITORS

Last ranking	First reviewed	Street price	Overall rating	Text quality rating	Graphics quality rating	Features, ease-of-use rating	Dot pitch or stripe (mm)	Max. refresh rate at 800 X 600 (Hz)	Reader service number	Comments
1	Oct 95	$350	85	60	85	65	0.28	90	611	Average text display, but top-notch graphics for a bargain price. Easy-to-use controls.
2	Oct 95	$460	82	76	79	70	0.28	75	612	Great text and graphics quality; Level 1 Plug and Play[1]; low refresh, but no visible flicker.
3	Oct 95	$425	80	79	68	63	0.28	90	613	Large 14-inch viewable area. Great spreadsheet detail from edge to edge.
4	Oct 95	$419	80	74	68	65	0.27	107	614	Crisp text and good graphics; high refresh rates, easy on-screen controls.
5	Oct 95	$499	79	85	74	63	0.25	90	615	Top text rating, vivid graphics, pricey; faint line across screen.
6	Oct 95	$525	79	72	62	85	0.27	108	616	Pricey; built-in speakers and mike; Level 2b Plug and Play[1]; 14-inch viewing area.
7	Oct 95	$409	79	68	67	67	0.28	90	617	High refresh rates; short two-year warranty; now has Level 2b Plug and Play[1].
8	Oct 95	$360	78	67	68	53	0.28	75	618	Budget price; does a good job with text and graphics. Limited refresh, but flicker-free.
9	current	$379	78	65	65	60	0.26	75	619	Easy analog controls; acceptable refresh; faint line across screen.
10	Oct 95	$425	78	65	66	70	0.28	100	620	Level 2b Plug and Play[1]; good text, graphics; fast refresh; small 13.4-inch viewing area.

1	**Princeton Graphics Ultra 15** 800/747-6249
2	**NEC MultiSync XV15** 800/632-4636
3	**ViewSonic 15G** 800/888-8583
4	**Panasonic PanaSync C-1591E** 800/742-8086
5	**Sony Multiscan 15sf** 800/352-7669
6	**ViewSonic 15GA** 800/888-8583
7	**ADI MicroScan 4V LM-1564** 800/228-0530
8	**Samtron SC-528 UXL** 310/537-7000, ext. 209
9	**Gateway 2000 Vivitron 1572** 800/232-2023
10	**Samsung SyncMaster 15GLi** 800/993-4110

[1] Plug and Play Level 1 sends monitor settings to graphics card; Level 2b adds a bidirectional capability between graphics card and monitor.

BEST BUY

Methodology: We tested the monitors at a resolution of 800 by 600 dpi, set at 65,536 colors and a vertical refresh rate of 72 Hz. We used a Micron P90 PCI PowerStation with 16MB of RAM and a Diamond Stealth 64 PCI graphics adapter with 2MB of DRAM. For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

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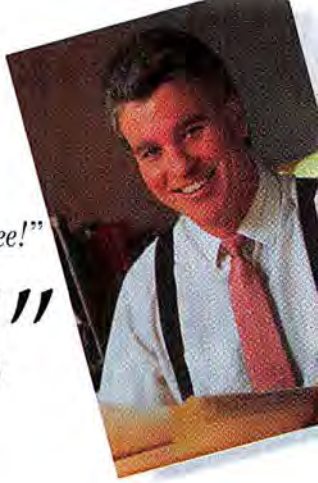

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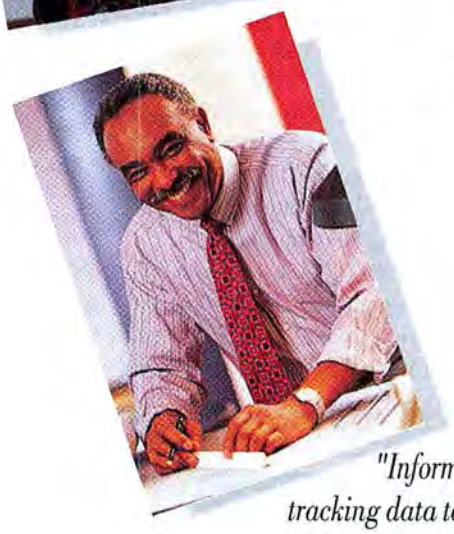

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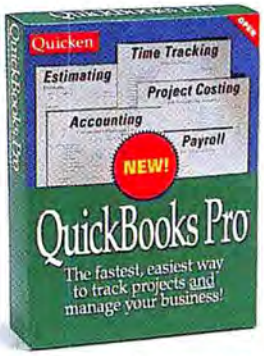

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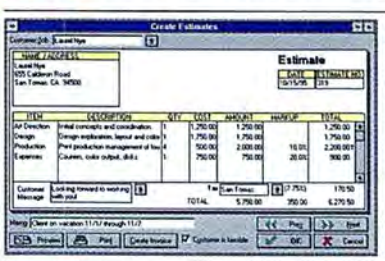

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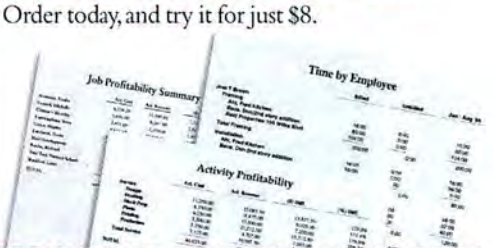

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Number Nine, Once Number 8, Now Number 3

Quantum Leap: ***The Number Nine 9FX Motion 771 is now stalking the leaders thanks to a lower street price. Its combination of speed and quality software make it a video board well worth considering.***

A mini price war and a handful of new drivers prompted a few changes in this month's lineup of accelerator boards. Two reasonably priced, high-performance Diamond video cards hung onto their Best Buys. But in the lower ranks, reduced street prices across Number Nine's entire line helped boost the 9FX Motion 771, now at $290, to third place. Umax Technologies, the only new face on the chart, is the first vendor to offer a high-quality, 2MB full-motion video board for under $200. Its Maxmedia Graphics 68D debuts at number eight with unremarkable installation and utility software, but commendable graphics performance and a hard-to-ignore price.

Sometimes it's worth upgrading your graphics board drivers to see if performance improves. This month we downloaded and tested the June 1995 drivers for the Matrox MGA Millennium and STB Velocity 64 Video. (We will test new drivers for other boards in coming months.) Both showed major improvement in QuarkXPress, but took hits in heavily weighted business applications like Word and Excel. The STB board's business application score dropped enough to shave points off its overall rating. Considering the volatility of drivers, however, the next STB drivers we try could improve its score.

We tested three other boards this month, but none earned a place on the chart. Western Digital's $229 Paradise Pipeline 64 video board has some good software for configuring your Windows work space, but its performance in our business applications was among the slowest we've seen. Similarly, Spider Graphics' $299 Tarantula 64 MK.II video board and dirt-cheap $135 Lynx 64 graphics adapter lagged significantly in business apps and missed the chart.

—Brad Grimes

TOP 10 GRAPHICS BOARDS

Last ranking		First reviewed	Street price	Overall rating	Performance ratings: Business applications	Performance ratings: Graphics applications	Max. refresh rate at 1024 x 768 (Hz)	Chip/installed RAM (MB)/type	Reader service number	Comments
1	Diamond Stealth64 Video 3200 800/468-5846	1	Sept 95	$269	84	83	85	120	S3 Vision968/ 2/VRAM	601	Higher price than estimated previously, but still the top board.
2	Diamond Stealth64 Video 2201XL 800/468-5846	2	Nov 95	$233	81	72	85	100	S3 Trio64V+/ 2/DRAM	602	MPEG software, weekend tech support, built-in MPEG and TV tuner support.
3	Number Nine 9FX Motion 771 800/438-6463	8	July 95	$290	80	80	82	150	S3 Vision968/ 2/VRAM	603	Lower street price, faster refresh boost fast board up the chart.
4	Matrox MGA Millennium 800/361-1408	4	July 95	$329	79	72	87	120	MGA-2064W/ 2/WRAM	604	Fast; 3-D acceleration, MPEG and 3-D software; no VL version.
5	Western Digital Paradise Bahamas 64 800/568-9272	5	Feb 95	$169	79	67	72	75	S3 Trio64/ 2/DRAM	605	Five-year warranty, toll-free and weekend support; no video acceleration.
6	STB Velocity 64 Video 800/234-4334	3	July 95	$299	79	74	81	120	S3 Vision968/ 2/VRAM	606	MPEG software, lifetime warranty; latest drivers slow in business apps.
7	Diamond Stealth64 Video 2200XL 800/468-5846	6	July 95	$233	78	71	80	100	S3 Vision868/ 2/DRAM	607	Good software bundle includes MPEG software; weekend tech support.
8	Umax Maxmedia Graphics 68D 800/562-0311	–	current	$180	78	66	81	120	S3 Vision868/ 2/DRAM	608	Low cost; no-frills video card; MPEG software; slow in business apps.
9	ATI Graphics Xpression 905/882-2600 ext. 1	10	Sept 94	$174	78	64	77	75	ATI Mach64/ 2/DRAM	609	MPEG software boosts value; five-year warranty; slow in business apps.
10	VideoLogic GrafixStar 700 800/578-5644	7	Oct 95	$349	77	78	79	100	S3 Vision968/ 2/VRAM	610	MPEG software, optional MPEG and TV tuner cards; pricey.

Windows Integrated Test Suite was developed by Jon Peddie Associates, a PC graphics consulting firm.

BEST BUY

Methodology Boards were tested at 1024 by 768 resolution at 256 colors and at 800 by 600 resolution at 16.8 million colors. The business applications rating consists of WITS scores for Word 2.0 for Windows, Excel 4.0 and Freelance Graphics 2.01 running in 8-bit mode, plus a score for Freelance running in 24-bit mode. The graphics applications rating consists of WITS scores for CorelDraw 3.0, PhotoStyler 1.1, and QuarkXPress 3.11 running in both 8-bit and 24-bit modes. The overall rating balances performance, estimated street price, features, and support policies. For all ratings, higher is better.

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For more information about all products in this table, circle reader service no. 901.

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[1] 14-inch viewable diagonal display size
[2] 16.05-inch viewable diagonal display size

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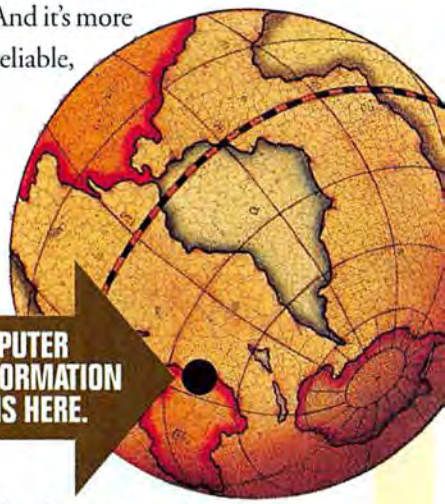

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On Dasher! On Dancer! On Sportster!

Bantam Best Buy
U.S. Robotics' diminutive Sportster V.34 Faxmodem makes fast, reliable connections.

Don't have time to take the kids to see Santa? No problem. This year, Kris Kringle is accepting orders over the Internet (**http://www.cyberspace.com/santa**). Need a fast, affordable modem to get there? Our two best stocking stuffers are the same as last month's Best Buys in our Top 10 list of 28.8-kbps modems: U.S. Robotics' Sportster V.34 Faxmodem and Practical Peripherals' PC288LCD V.34.

The fleet, inexpensive Sportster V.34 Faxmodem offers fine performance for a modest $219. The PC288LCD V.34 modem isn't cheap at $359, but it's loaded with ease-of-use features, including an English-language readout panel rather than just the cryptic status lights found on virtually all other modems.

Of the five new 28.8 modems we tested this month, only one scored well enough to make it onto the chart: Supra's $250 SupraFaxModem 288, which debuts in tenth place. This compact unit doesn't have blow-the-doors-off performance, but it comes with user-upgradable firmware and Caller ID support. Of the modems that didn't make our Top 10 list, Multi-Tech Systems' MT2834PCS performed well, and it's packed with security features as well as voice-mail and voice/data-switching capabilities. But it costs $600 on the street.

E-Tech's E288MX Bullet ($239) and Hayes's Accura 288 V.34+Fax ($229) are basic modems with below-average performance and support policies. The Logicode QuickTel 2814XV ($189) is a full-featured modem with a striking modern-sculpture design. But none of these connected at the maximum speed of 28.8 kbps more than 8 percent of the time, possibly because of their chip set and firmware combination. However, many vendors frequently upgrade their modems' firmware. We retest each model every time it gets a significant firmware upgrade.

TOP 10 MODEMS

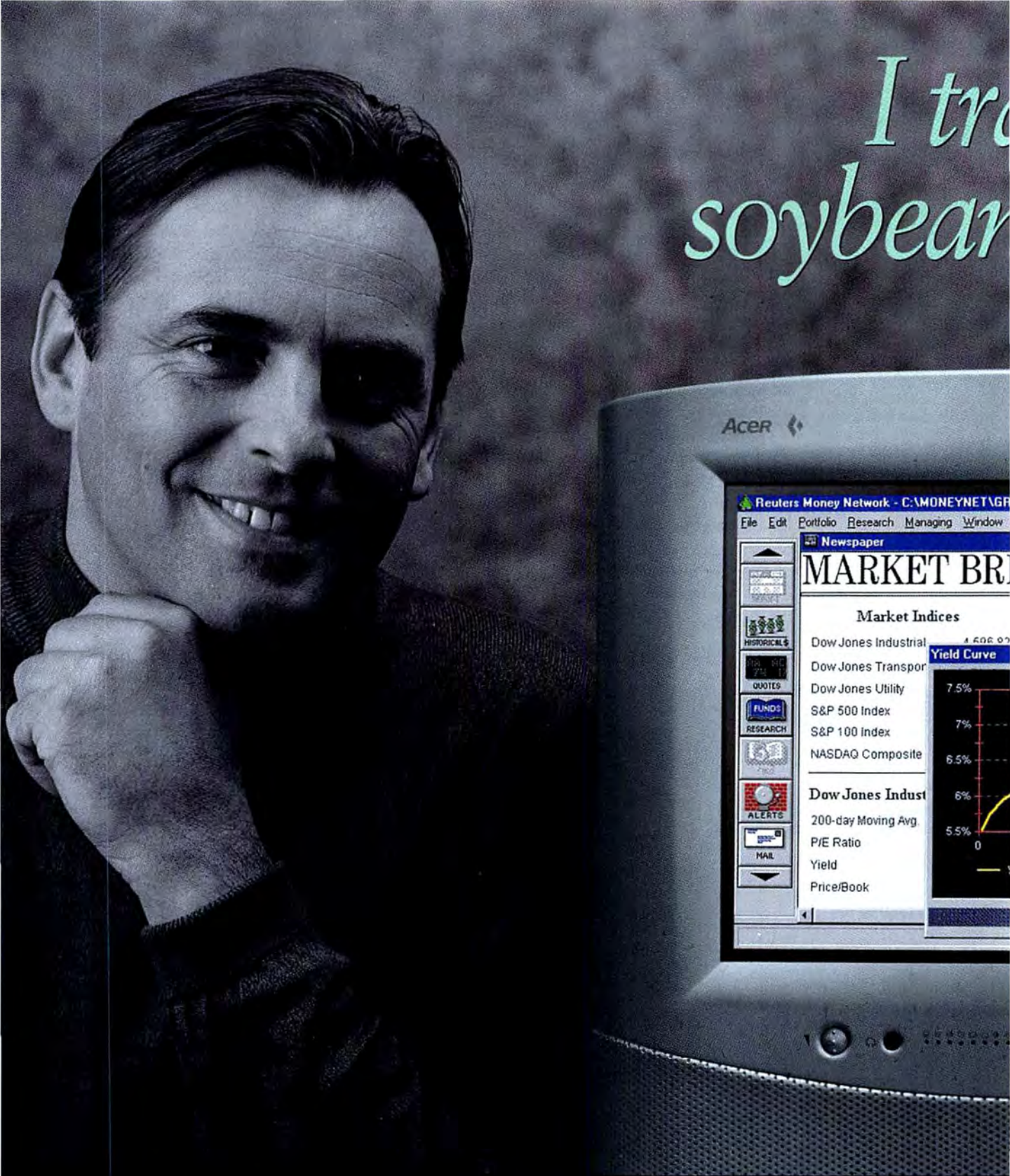
	Last ranking	First reviewed	Street price external/internal (USA)	Overall rating	Throughput rating	Connect rating	Features, ease-of-use rating	Data/fax speed (kbps)	Reader service number	Comments
1	1	Nov 95	$219/ $199	86	77	88	78	28.8/ 14.4	621	Supersmall unit stays no. 1 with performance, low price.
2	2	Nov 95	$359/ —	85	85	82	83	28.8/ 14.4	622	Pricey, but great performance, features, and support.
3	3	Nov 95	$174/ $145	84	81	73	76	28.8/ 14.4	623	Ideal for the technically savvy on tight budgets; voice/data switching.
4	4	Nov 95	$300/ —	83	78	92	74	28.8/ 14.4	624	Basic unit, but top connect performance, support.
5	5	Nov 95	$219/ $199	83	80	72	73	28.8/ 14.4	625	Respectable unit at a low price; mediocre connect reliability.
6	6	Nov 95	$391/ —	83	75	90	85	28.8/ 14.4	626	Very good connect performance; parallel port connection.
7	7	Nov 95	$199/ $149	83	79	70	73	28.8/ 14.4	627	Good price, long support hours, but connect reliability lags.
8	9	Nov 95	$221/ $199	83	75	80	75	28.8/ 14.4	628	Good performance and feature set; price cut moves it up a notch.
9	8	Nov 95	$229/ $209	81	81	66	72	28.8/ 14.4	629	Attractive price, good support, but low connect reliability.
10	—	current	$250/ $200	80	72	69	79	28.8/ 14.4	630	Lackluster performance, but a compact unit with nice features.

	1	Nov 95	$219/ $199	86	77	88	78	28.8/ 14.4	621	Supersmall unit stays no. 1 with performance, low price.
U.S. Robotics Sportster V.34 Faxmodem 800/342-5877										
2	2	Nov 95	$359/ —	85	85	82	83	28.8/ 14.4	622	Pricey, but great performance, features, and support.
Practical Peripherals PC288LCD V.34 404/840-9966										
3	3	Nov 95	$174/ $145	84	81	73	76	28.8/ 14.4	623	Ideal for the technically savvy on tight budgets; voice/data switching.
MaxTech XM288E 800/936-7629										
4	4	Nov 95	$300/ —	83	78	92	74	28.8/ 14.4	624	Basic unit, but top connect performance, support.
Motorola ISG Power Class 28.8 Data/ Fax Modem 800/568-3266										
5	5	Nov 95	$219/ $199	83	80	72	73	28.8/ 14.4	625	Respectable unit at a low price; mediocre connect reliability.
AT&T DataPort Express 800/482-3333										
6	6	Nov 95	$391/ —	83	75	90	85	28.8/ 14.4	626	Very good connect performance; parallel port connection.
Microcom DeskPorte Fast 28.8 800/822-8224										
7	7	Nov 95	$199/ $149	83	79	70	73	28.8/ 14.4	627	Good price, long support hours, but connect reliability lags.
Zoom Telephonics V.34X 800/631-3116										
8	9	Nov 95	$221/ $199	83	75	80	75	28.8/ 14.4	628	Good performance and feature set; price cut moves it up a notch.
Boca Research V.34 28,800bps External BocaModem 407/997-6227										
9	8	Nov 95	$229/ $209	81	81	66	72	28.8/ 14.4	629	Attractive price, good support, but low connect reliability.
Practical Peripherals PM288MT II V.34 404/840-9966										
10	—	current	$250/ $200	80	72	69	79	28.8/ 14.4	630	Lackluster performance, but a compact unit with nice features.
Supra SupraFaxModem 288 800/727-8772										

BEST BUY

Methodology: We used a simulated public-service telephone network from Telecom Analysis Systems to test each pair of identical modems, approximating 55 line conditions representing 95 percent of all domestic phone lines as defined in the testing specification TIA/EIA 37A. Performance and features contribute most to the overall rating, followed by support and price. For all ratings, higher is better. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

For more information about all products in this table, circle reader service no. 903.



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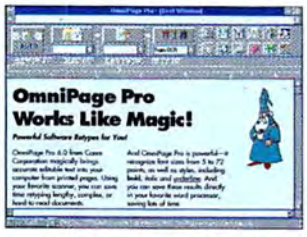

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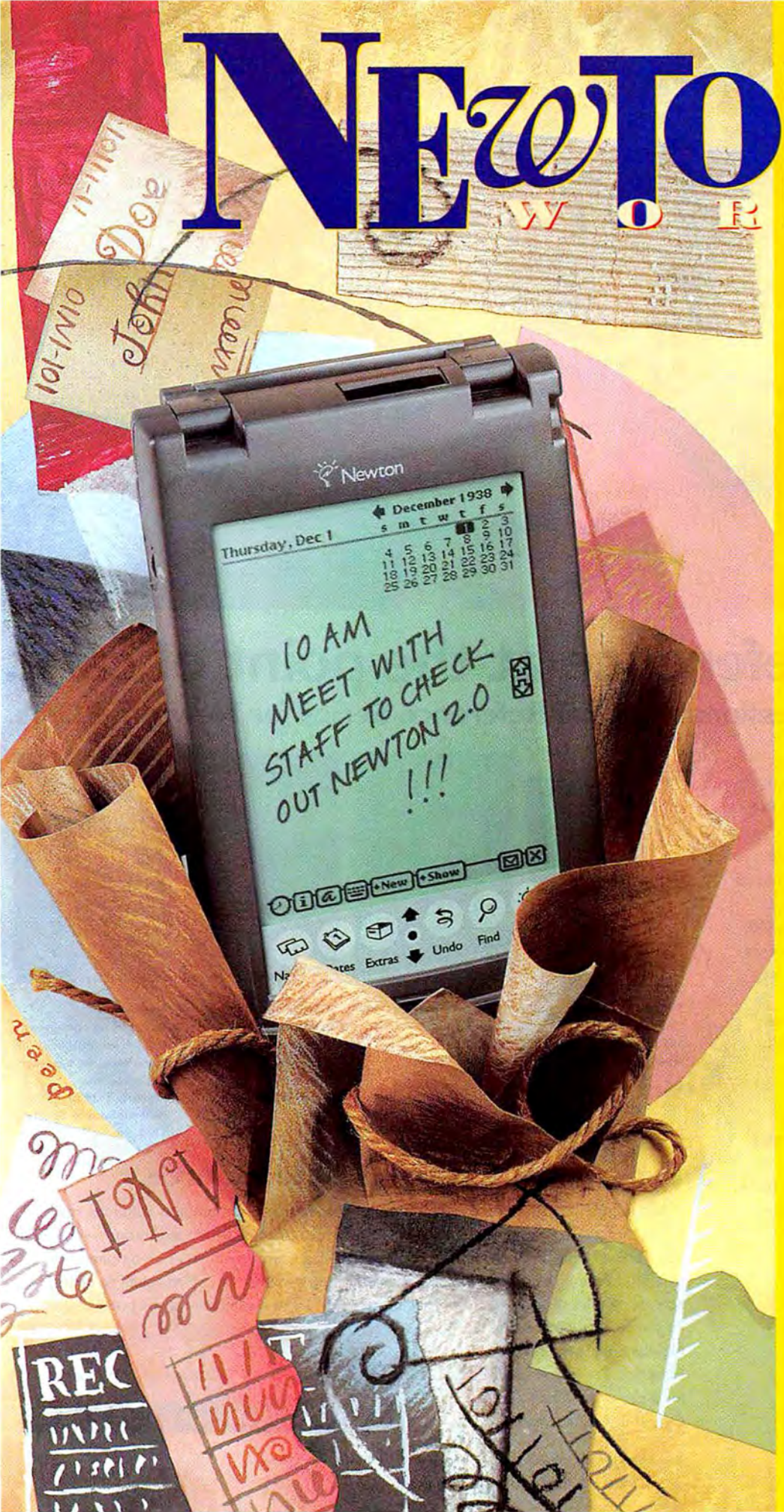
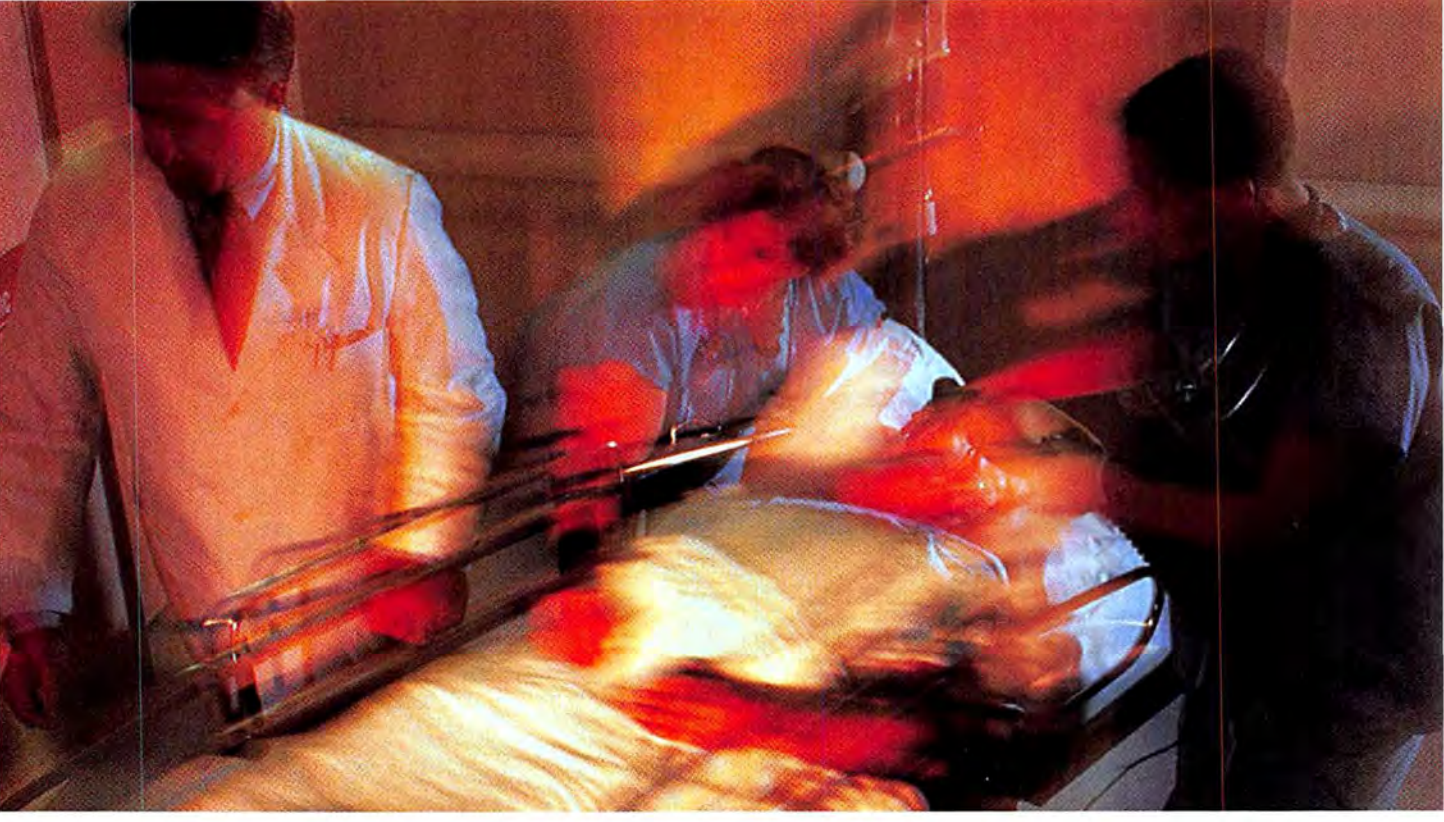


What's New With Newton?

COMPUTING ON THE MOVE: *Stories of Real People*

New Advances on Newton Applications

Edited By
Bronwyn L. Fryer



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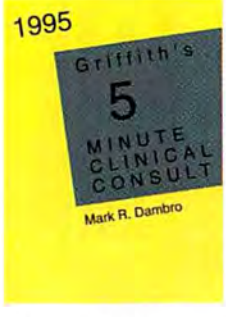

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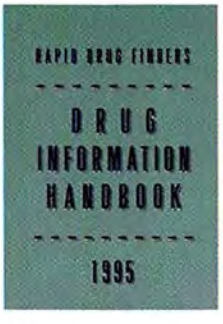

Drug Information Handbook
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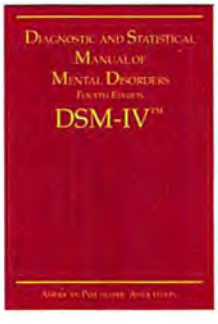

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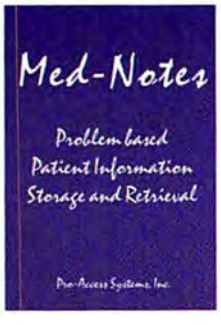

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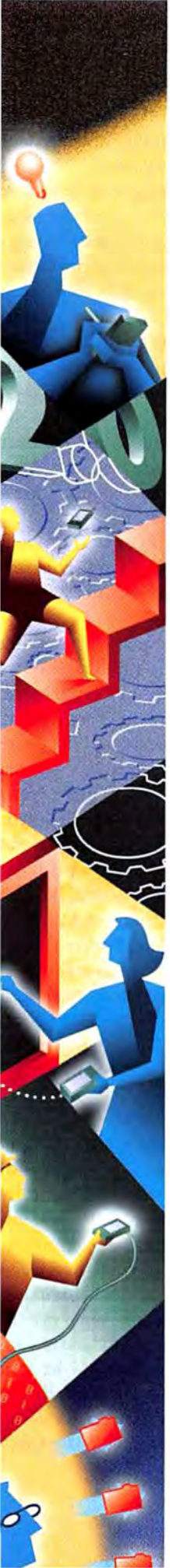


What's New with Newton

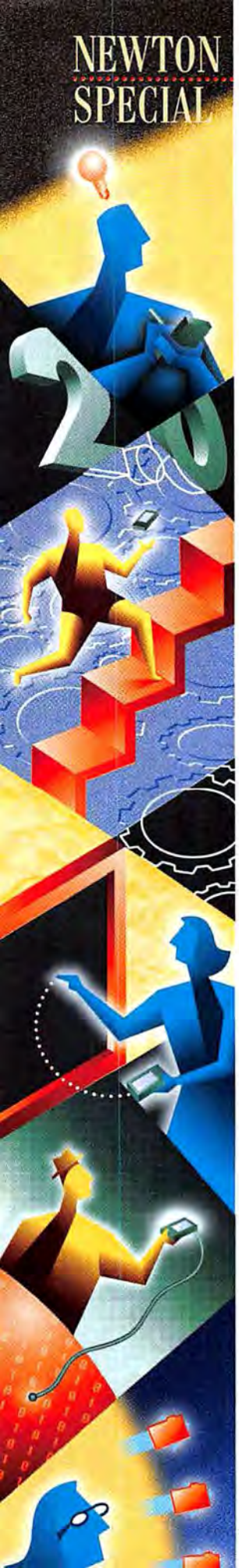
The latest operating system upgrade for Newton moves Apple's PDA from the bleeding edge to the leading edge.

BY NICK WINGFIELD

When I got my first-generation Apple Newton MessagePad—Newton for short—back in October 1993, friends would always ask to play with it. First, I'd explain that my personal digital assistant (PDA) wasn't a toy, but a computer. Then I'd configure my Newton for guest use to avoid corrupting my carefully calibrated handwriting recognition and send them on their merry way.

By the time I got my Newton back, my friends' notes would be a jumble of incomprehensible sentences, thanks to its poor handwriting recognition. "Don't understand it," my friends would say. Alas, my Newton had the same problem with me: it didn't understand. Eventually, the two of us reached an agreement. I would tolerate its whimsical view of my handwriting, if it would keep the rest of my life—or at least my contacts and my schedule—in order. It did, but I secretly longed for a PDA that was more sensitive to my needs.

ILLUSTRATIONS: JOHN BLECK



Like any first-generation operating system—remember version 1.0 of Windows?—the Newton 1.0 operating system had serious problems. But today, more than two years after introducing the technology, Apple Computer has released the first major overhaul of the Newton operating system (OS), a software engineering feat that finally liberates Apple's PDA from its Rodney Dangerfield status. The new Newton 2.0 OS is a thorough, top-to-bottom housecleaning of the original Newton software and includes some substantial interface enhancements and key improvements to the MessagePad's resident applications.

A beefed-up word dictionary and much-improved printing and cursive handwriting recognition make the Newton 2.0 worth a second look.

Once Upon a PDA

In its first two years of life, Newton was proclaimed dead more often than disco. Among the first products in a new class of lightweight, handheld, mobile devices, Newton—along with the Tandy Zoomer and AT&T EO—was created as a small, intelligent, go-anywhere tool for capturing, managing, and communicating information. Designed to fit easily into a briefcase or purse or on a dashboard, PDAs like these were supposed to let you scribble notes with a stylus and touch-sensitive screen, send and receive E-mail or faxes, or retrieve a name, note, or appointment in less time than it takes to unzip your laptop bag.

Despite much ballyhoo from former Apple CEO John Sculley and an early round of kudos from the press in late 1993, it didn't take long before Newton started getting negative ink, mainly for its most radical feature: handwriting recognition. The original Newton MessagePad failed so miserably in this area that cartoonist Gary Trudeau devoted a week of his Doonesbury comic strip to ridiculing the MessagePad's recognition errors. *Saturday Night Live* also did a hilarious spoof of Newton, lampooning it as an intelligent refrigerator magnet/sticky note.

The MessagePad had other problems as well: a memory leak requiring frequent restarts, sluggish performance, short battery life, and poor links to desktop applications. Comparisons to failed products like the 1950s Edsel automobile were frequent, and some industry pundits even demanded that Newton be recalled. Sculley's mass market for PDAs didn't appear. After some initial sellouts, MessagePad sales fell flat. Other PDAs, like the bulky, overpriced EO, also suffered in the marketplace and were eventually pulled from shelves.

Despite all the bad press, Newton spawned a dedicated group of more than 4,000 developers and a vast library of shareware on CompuServe, America Online, and the Internet. There are currently more than 1,000 commercial and shareware applications for Newton. To an equally devoted community of over 100,000 users, Newton, warts and all, has as much potential to affect our lives as our PCs and Macs do now. "We all looked at the original Newton and said, 'We see the potential, here,' just like we looked at the Mac and saw the potential there," says Larry Slack, owner of RealWorld Testing, a consulting service based in Ithaca, New York. "The original 128K Mac was a toy, but we loved it!"

In Recognition

With the release of Newton 2.0, Newton is poised to push beyond the ranks of these early adopters. Version 2.0 is an impressive product that offers much-improved mobile data capture and management features. Some industry observers think Apple may finally have delivered the useful, usable product it promised back in 1993. "Newton 2.0 is clearly the Newton Apple should have developed in the first place," says Gerry

Purdy, editor of *Mobile Letter*, based in Cupertino, California. "Finally, it's a stable working platform that a sense of believability can be built on."

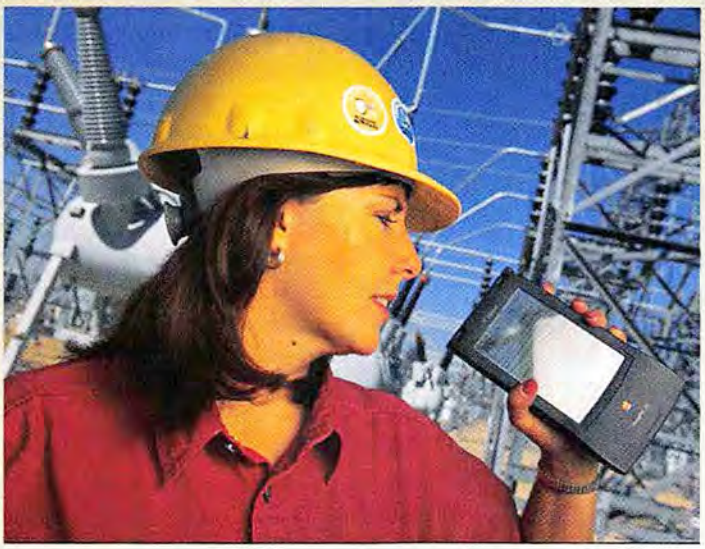
The most remarkable improvement in Newton 2.0 was also the most maligned feature of the original: handwriting recognition. Its print and cursive recognition makes the earlier Newton seem positively illiterate in comparison. Recognition still isn't 100 percent accurate; the new Newton still requires a degree of discipline and penmanship, like parochial school. But notetaking, a challenge with the original Newton, is actually possible now, according to Newton 2.0 users. "I use the new Newton to take notes in depositions," says Jeff Goldman, an attorney based in San Francisco and a Newton 2.0 beta tester. "I don't carry a legal pad anymore. Newton 1.0 didn't read my handwriting nearly as fast or as accurately as Newton 2.0 does."

REAL PEOPLE

Operating Under Her Own Power

"Until last year, I hadn't even heard of a personal digital assistant," says Janis Wheeler, substation inspector for the Idaho Power Company. "When I first got one, I said, 'Oh, that's a nice toy. Now what do I do with it?'"

It took Wheeler a scant few days to learn how the "toy" would transform her job. Last fall, she became the first substation inspector at Idaho Power to convert from paper entry to a PDA application developed by AllPen Software (408/399-8800). Called Idaho Power Substation Inspection System (IPSIS), the tailor-made software runs under Newton 2.0 on an Apple MessagePad 120. Armed with the 1.4-pound hardware device, Wheeler has freed up a week out of her month, which is now devoted to more important tasks than onerous paperwork.



"Before, it could take up to three hours to inspect a substation," says Wheeler. "Now it takes an hour and a half, two hours at the most." In the old days, she handwrote data on a clipboard while inspecting any of dozens of power stations in remote areas of Idaho, Oregon, and Nevada. She also had to log the same information to another sheet as a record to be left in the station. At the end of her day out in the field, Wheeler returned to the office and entered the identical information into a database. Worse, an administrative assistant later retyped the data on a desktop computer at Idaho Power's downtown office, since the company was not networked.

Along with saving time and eliminating errors due to double entry, the Newton saves Idaho Power money. "The utility industry is extremely competitive right now," says AllPen president Wayne Yurtin, who worked with Idaho Power to develop the IPSIS application. "This technology is helping utility companies reduce operating costs."

NAME **JANIS WHEELER**
OCCUPATION **SUBSTATION INSPECTOR**
COMPANY **IDAHO POWER COMPANY**
APPLICATIONS **IPSIS, EQUATE, GO FIGURE, NOW UP-TO-DATE, NOW CONTACT, GRAFFITI, NEWTON UTILITIES**

The IPSIS software meets needs specific to a substation inspector's job. For example, a pop-up list of inspection duties allows an inspector to fill in the blanks on screen, rather than write out long forms. Once the information is logged, the inspector plugs a serial port or network communications line into the MessagePad, then uploads the data to a FileMaker Pro database running on a Macintosh IIci network server. Anyone on the network can access it, generate work orders, schedule maintenance, or track potential problems by keeping a history of equipment.

Wheeler now says she couldn't dream of working without her PDA. "Carrying a one-pound MessagePad is far easier than lugging a laptop," she says. All she needs when she gets in her truck is her handheld computer, a holster for when she needs both hands free, extra batteries, a radio, and her cell phone. And she's looking forward to the near future when Idaho Power inspectors send and receive wireless E-mail and faxes using Digital Ocean's AppleTalk networking hardware.

"Now that we have the software perfected, I'll be training other inspectors and service workers," says Wheeler. "I'm hoping that, after they see how well this is working, other departments in the company will recognize the advantages of PDAs. They're a great, low-cost solution for what we do." **Leslie Crawford**

ACEY HARPER

Printed writing is where Newton 2.0 really shines. As in the first version of Newton, there's digital ink capture so users can jot down notes without converting them to text. But a new print recognizer, based on neural network software developed internally at Apple, now interprets my handwriting better than some of my friends do, even when I use abbreviations like "mtg." for meeting or "w/" for with. Thanks to a beefed-up word dictionary, cursive recognition, which is based on word recognition, is also significantly improved.

In all of its resident PIM applications—Names, Dates, and the Notepad—Newton 2.0 displays a caret pointer that indicates where new text will appear on the device. This feature was a cruel omission from the first Newton, where words seem to land wherever they please. The caret in Newton 2.0 has another useful feature: tapping it displays a pick list of punctuation marks.

For all its importance, though, handwriting recognition is not what Newton 2.0 is all about, points out beta tester Slack. "The main thrust of Newton technology is not handwriting recognition," he says. "The problem has always been getting the information in there to manage. Newton 2.0's recognition is a quantum leap forward." To Slack and other users, handwriting recognition is a means to an end. Newton' s information management facilities are the real reason they use the device.

Managing the Info Flow

For most users, Newton's trio of resident PIM applications is where they live and breathe. With Newton 2.0, Apple has added loads of flexibility to the core applications, so information is easier to access and manage. In the earlier Newton, for example, it was nearly impossible to find ink notes in the Notepad. In Version 2.0, the improved Overview

THE HARD PART: SORTING OUT THE PDAS

Like Macintosh and Microsoft Windows, Newton is the name of the operating system; Apple's hardware device is called the MessagePad. If that's not confusing enough, try the correct name for Apple's hardware/software combination in its most recent $699 reincarnation: "MessagePad 120 with Newton 2.0 Operating System." (Us plain folks should probably stick to calling the whole ball of wax "Newton.")

Nomenclature is not the only confusing thing about the PDA market, nor is Apple the only player. So far, according to BIS Strategic Decisions, a market research firm in Norwell, Massachusetts, Apple has been the most prolific manufacturer of PDAs, with 71 percent of the U.S. PDA market. It's also the leading manufacturer of Newton-based devices. But Apple has licensed the Newton 2.0 operating system to other vendors. Motorola (800/894-7353) offers Marco, a Newton equipped with two-way wireless communications via the Ardis network. Marco comes with wireless E-mail software, but applications vendors can exploit its wireless links as well. Harris Corporation's Dracon Division (800/787-3783, ext. 3106) sells a ruggedized, waterproof Newton called Craft Digital Assistant with wireless communications and backlighting, targeted at utilities workers and other field personnel.

On the operating system side, Newton 2.0's major competitor is Magic Cap from General Magic (800/468-4342). Newton and Magic Cap are like half-siblings—related but entirely different. Magic Cap is frequently described as being more communications centered than Newton, largely because it includes a sophisticated technology called Telescript, a programming language that sends intelligent agents out to a network to perform tasks for users.

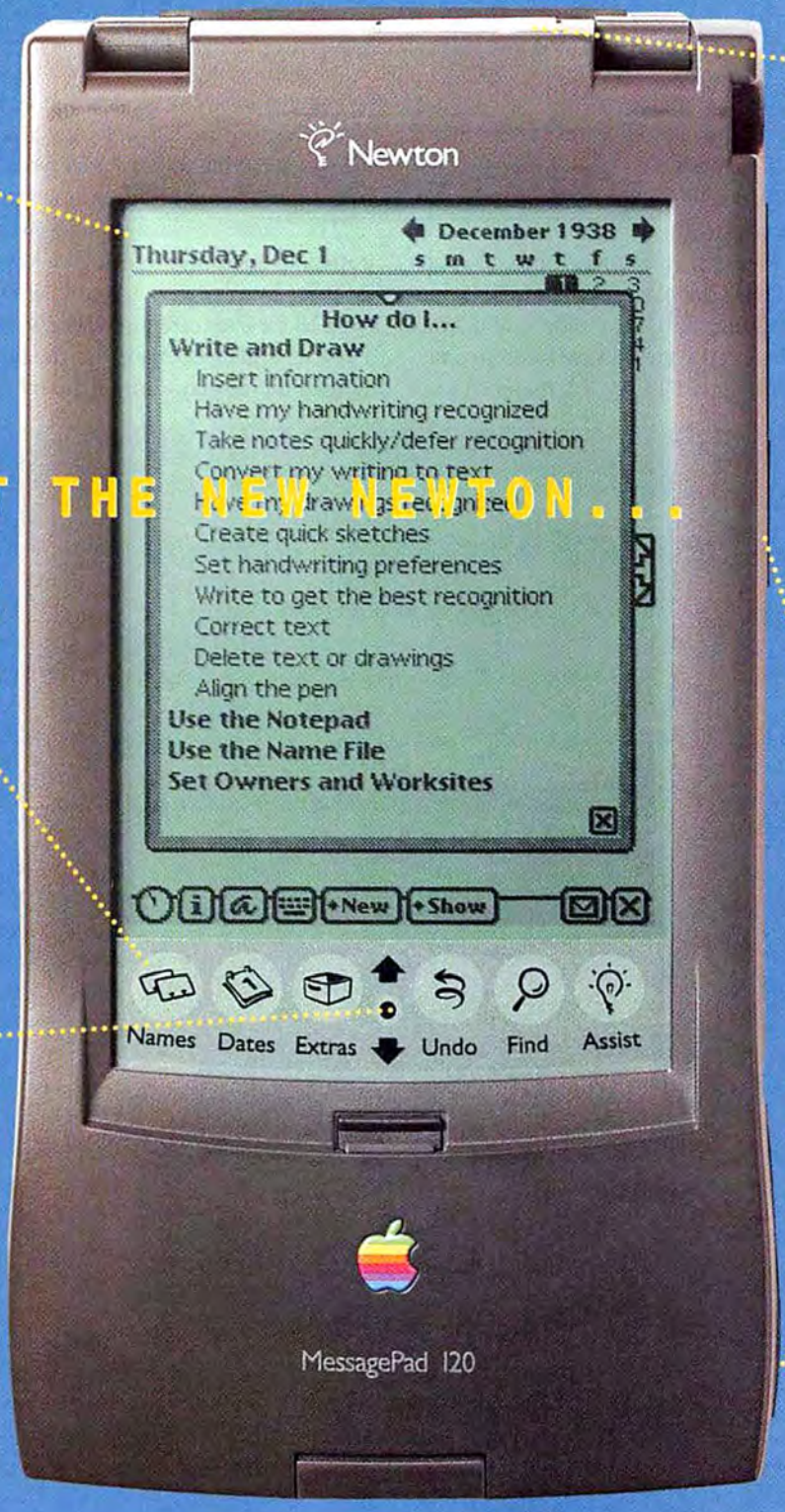
Newton 2.0 is closer to Windows 95 or a Macintosh environment and is more adept than Magic Cap at capturing and managing information. Newton also works with a number of communications cards and cellular and wireline modems and with Motorola's messaging card.

HOW TO UPGRADE

The Newton 2.0 operating system is now shipping with all new MessagePad 120s, which feature the same hardware configuration as the original: an ARM 610 20-Mhz RISC processor with 1.3 MB of usable RAM and a PC card expansion slot. (Not every PC card is compatible with Newton: be sure to ask the vendor if a card is Newton-friendly before plunking down your hard-earned cash.)

Original MessagePad 120 users can upgrade from Newton OS 1.5 to 2.0 for $109 by sending their PDAs in to Apple for a ROM exchange. MessagePad 100 and 110 owners can't upgrade their Newtons, but Apple offers a trade-in program for the older devices. For more information on upgrading, call Apple at 800/767-2775. **N.W.**

MEET THE NEW NEWTON...



The Notepad is like a continuous roll of paper for writing and sketching. It contains checklist and outline facilities.

A panel of icons provides access to Newton's resident applications, search facility, and intelligent assistant.

The Overview button displays summary information for notes, names, dates, and items from other applications.

Through the infrared port, users can beam notes, appointments, and names to other Newtons.

The telescoping pen is to Newton what the keyboard is to PCs: a way of capturing data and interacting with the device.

The Type II PC Card slot accepts memory expansion cards and both wireless and wireline modems.

Newton connects to printers, modems, and desktop computers with an RS-232 serial cable. The serial port also supports connections via LocalTalk cables, Apple's standard for local area networks.

NEWTON TIMELINE

SUMMER 1987
Apple launches a small "special projects" effort. Its goal: to research wireless networking, investigate handwriting and formula-recognition technology, and define a new architecture called "Newton."

MAY 1992
Apple Computer provides the first glimpse of Newton, the company's first major new product since the popular Macintosh personal computer was introduced in 1984.

AUGUST 1993
From the stage at Boston's Symphony Hall, John Sculley and Gaston Bastiaens announce that the first Newton—the MessagePad communications assistant—is shipping. Reviewers rave, then hiss.

JANUARY 199[illegible]
An even more improved Messa[illegible] 120 ships; Motorola announces its Marco W[illegible] Communicat[illegible] based on Newton technology. In A[illegible] Harris Corpora[illegible]tion's Dracon Division license[illegible] Newton for the SuperTech 2000, Craft Digi[illegible] Assistant.

MARCH 1994
Apple introduces the improved MessagePad 110.

December 199[illegible]
Newton 2.0 ships.

1987 · 1988 · 1989 · 1990 · 1991 · 1992 · 1993 · 1994 · 1995

button, which displays all files within each application, now displays ink as well as text contained in Notepad's individual notes.

The new Overview lets you to do batch mailings, faxes, infrared beams, or printings of all resident files, whether they're Names, Dates, or Notepad files. And unlike the older Overview, it now enables mass deletions, filing into folders, and swapping of items between Newton's two stores—internal RAM storage and a PCMCIA memory card. Doing a selective mass deletion of notes with the older Newton was like polishing a car with a Q-tip. "It was annoying as hell," says Goldman. "Moving things into different folders was a problem."

The Names application in Newton 2.0 has also gotten an appealing facelift. It allows you to create group as well as individual and company name files. An icon for each category makes it easier to identify a file at a glance. Also, the detail view for each Names file displays only fields—last name, work

REAL PEOPLE

How a Teacher Makes the Grade

Phyllis VonStrohe, a first and second grade teacher in Covington, Kentucky, used to take notes about her students' progress and achievements the hard way. While watching Tommy or Janie work on a painting or play with other children in the classroom, VonStrohe had to take fast, copious notes–while standing, juggling a pen and notepaper–that she then had to retype and reorganize into a report.

Gathering, collating, and reporting demanded a total of 24 hours every nine weeks–time that VonStrohe would have preferred to spend on activity planning. "I had to collate and review five sets of handwritten performance notes for each student," she recalls. "I spent a three-week period just writing the narrative portions of the students' reports for 24 students."

NAME **PHYLLIS VONSTROHE**
OCCUPATION **SCHOOL TEACHER**
COMPANY **TAYLOR MILL ELEMENTARY, COVINGTON, KENTUCKY**
APPLICATIONS **LEARNER PROFILE**

Today, VonStrohe takes it a little easier. Using Learner Profile from Sunburst Communications (800/321-7511) on a handheld Newton MessagePad 120, she has cut the time it takes to prepare narrative evaluations from 24 hours to 9 hours.

For the K–12 market, Learner Profile ($99 for the PDA software for Macintosh or $109, including a special cable, for the PDA component for Windows, and $299 more for the desktop companion program) on the MessagePad permits VonStrohe and other teachers to replicate the gradebook process. Educators can define the number of students and types of grades and walk around the classroom while tapping on children's names, entering grades, and displaying statistics such as the grade mean, mode, and standard deviation. They also define student's levels of performance by category, such as "developing" or "mastered."

Teachers can transfer the recorded data to their desktop IBM-compatible or Macintosh PCs to print out reports. VonStrohe connects her MessagePad to her desktop machine while her students line up for lunch. When she walks back five minutes later to disconnect the MessagePad, she's ready to record for the remainder of the afternoon. "It's a very easy to learn, simple to use, powerful environment," VonStrohe says. "I found that not only did the quantity of observations that I recorded increase, but the quality of the observations was improved."

A new version of Learner Profile for the Newton 2.0 takes advantage of many of the new operating system's features. Use of ink text allows teachers to quickly write evaluations without waiting for recognition; these notes can stay in digital ink form or be converted to text later. The new product also employs Newton 2.0's speed improvements in storage and the new screen rotation to allow users to access and see more data more easily.

As a mobile worker who welcomes any help in increasing classroom efficiency, VonStrohe says she can't imagine going back to using a pen and paper. "I was doing cartwheels down the school hallway, as were other primary teachers," she notes. "With this kind of technology, the black gradebook we all remember will soon be a relic of the past." **Marie d'Amico**

PATRICK McDONOGH

The MessagePad 120 personal digital assistant makes your information as mobile as you are.

The MessagePad® 120 allows you to organize your work and personal life; to integrate information with your personal computer; to communicate using faxes, pages, and e-mail; and to expand your capabilities with third-party solutions.

It has a built-in Notepad, to-do list, datebook, telephone log, and address file for organizing personal and business affairs, as well as Pocket Quicken to help organize personal and business expenses.

You can enter information in many ways: as digitalink, printed text, hand-drawn graphics, or with an on-screen keyboard. There's even an optional external keyboard.

Pen-based navigation and data entry make finding information easy and fast.

The improved recognition software of MessagePad 120 transforms your handwriting into typed text. You can also print your information as it appears on the easy-to-read screen, or as fully formatted pages.

The MessagePad 120 can receive wireless messages and alphanumeric pages, and can send and receive faxes and electronic mail. Included eWorld™ software allows you to communicate with Internet users via eWorld.

The MessagePad 120 also lets you share and exchange information with either Windows software–based or Macintosh® computers using the included Newton® Backup Utility and Newton Press software.

Your MessagePad 120 can also be customized with software applications as well as accessories and on-line services that put critical information at your fingertips, no matter where you are.

The Newton 2.0 operating system provides effective solutions to keep you organized, in touch, and connected to your world.

Newton®

Call 1-800-909-0260 for more information or visit our Internet address: www.info.apple.com/newton

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phone number, and so on—that have been filled out, reducing the on-screen clutter of the earlier version.

Also gone from Names are the niggling limitations on the number of fields that you can attach to a file. You can now add multiple E-mail addresses, phone numbers, and other items to a name. There is an editable pick list at the bottom of each Names file that displays custom categories—"Turn ons," for example. All around, Newton 2.0's pick lists are far more intelligent than its predecessor's, and pick lists include, in some cases, the eight items previously entered into a field. Pick lists are a superb way of streamlining tasks by reducing dependence on handwriting recognition, and Newton 2.0 exploits them well. "Pick lists streamline Newton 2.0 immeasurably," says Goldman. "Anything that eliminates hunting and pecking is a big help."

Apple has included a new application, Calls, in Newton 2.0 that ties in well with the Names application.

The pick lists in Newton 2.0 include up to eight previously entered items.

Navigating by Icon

NAMES
Look up addresses by tapping on an icon.

DATES
Check your schedule with the touch of a pen tip.

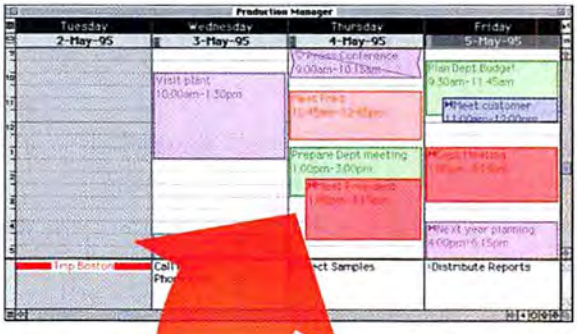
EXTRAS DRAWER
An Extras Drawer lets you easily access applications and utilities.

UNDO
Don't like what you wrote? Then just change it with the Undo icon.

ASSIST
Automate common tasks, such as dialing names in your address book.

TeamAgenda keeps you in synch with your office schedule

Your Newton becomes an extension of your office with the ***TeamAgenda*** Synchronization Module. Work off-site on your Newton, then synchronize with your office schedule using ***TeamAgenda***, the leading cross-platform Group Scheduler in Europe and Japan.



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Newton 2.0

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It's excellent for keeping track of telephone calls. Newton records the recipient, duration, and date of calls, as well as notes related to the call.

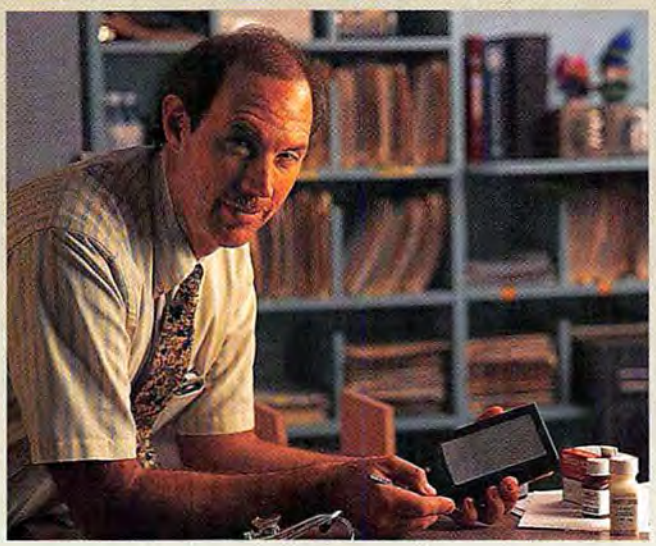
The Notepad and Dates applications have been refined in the new operating system. Not just for linear notetaking, the Notepad now includes facilities for creating collapsible outlines and checklists. Instead of scrolling papyruslike to the end of the Notepad and drawing a horizontal line to create a fresh note, you can simply select New Note from Newton's status bar. Dates also has some interface enhancements, including icons for different types of events. Pick lists make it easier to enter appointments and to view the calendar in different ways.

REAL PEOPLE

A Prescription for the Digital Doctor

Dr. Dale Adamson, a private-practice physician in Naples, Florida, is the first to tell you he's a technical neophyte. "I'm a good doctor, but I don't know anything about computers," he admits.

Still, Dr. Adamson's job requires that he keep flawless documentation. In the old days, he carefully wrote down every fact about his patients' health to have accurate records for pharmacies, insurance companies, hospitals, and other care professionals. But the time it took to locate a patient's paper file, take notes on what the patient had to say, write out a report, and reinsert the information into the patient's records was too big a chunk of Adamson's time, which includes up to 3,000 office visits a year. "I was spending two hours a day just on notetaking," he recalls.



NAME **DR. DALE ADAMSON**
OCCUPATION **PHYSICIAN**
COMPANY **SELF-EMPLOYED**
APPLICATIONS **POCKET DOC, MEMORY MANAGER, DYNONOTE SOFTWARE**

In 1993, Adamson switched from handwritten notes to taking notes with an Apple Newton MessagePad 100. While the device helped record notes, it frequently misread the doctor's writing; once, the hard drive froze after he'd added some 1,000 words of medical terminology.

Then in February 1995 Adamson heard about Pocket Doc, from Physix (713/797-1199), a software application designed by an engineer who is also a doctor. Pocket Doc's creator, Dr. Tom Giannulli, couldn't find any good medical software specifically for PDAs, so he created an application himself. "I knew that doctors wouldn't carry anything around that didn't fit in their pocket," explains Giannulli. "They're very mobile and don't have the patience or time to lug around a lot of equipment."

The Pocket Doc software allows doctors to gather data in real time, using the PDA's pen as a pointing device to call up specially designed menus and tap out a selection of keywords. With Pocket Doc, the doctor can easily create flowing paragraphs from a patient's history. In addition to serving as a meticulous record keeper, storing medical records of at least 100 patients, formularies for 800 drugs, and 1,300 billing codes, Pocket Doc enables the medical practitioner to send prescriptions to the pharmacy, access medical data and terminology, and even tap into a pharmaceutical database that reduces dosing errors by automatically listing dosages for various medicines when a doctor taps out a prescription.

"Pocket Doc has dramatically changed the way I take notes," concurs Adamson, who, when interviewing a patient, simply taps information directly into templates, a method of chronicling a patient's medical history that proves not only convenient but more reliable than handwritten notes. "The real beauty is that, because managed care requires such careful documentation, I can safely have all the necessary records at a Medicare audit and meet all of their criteria."

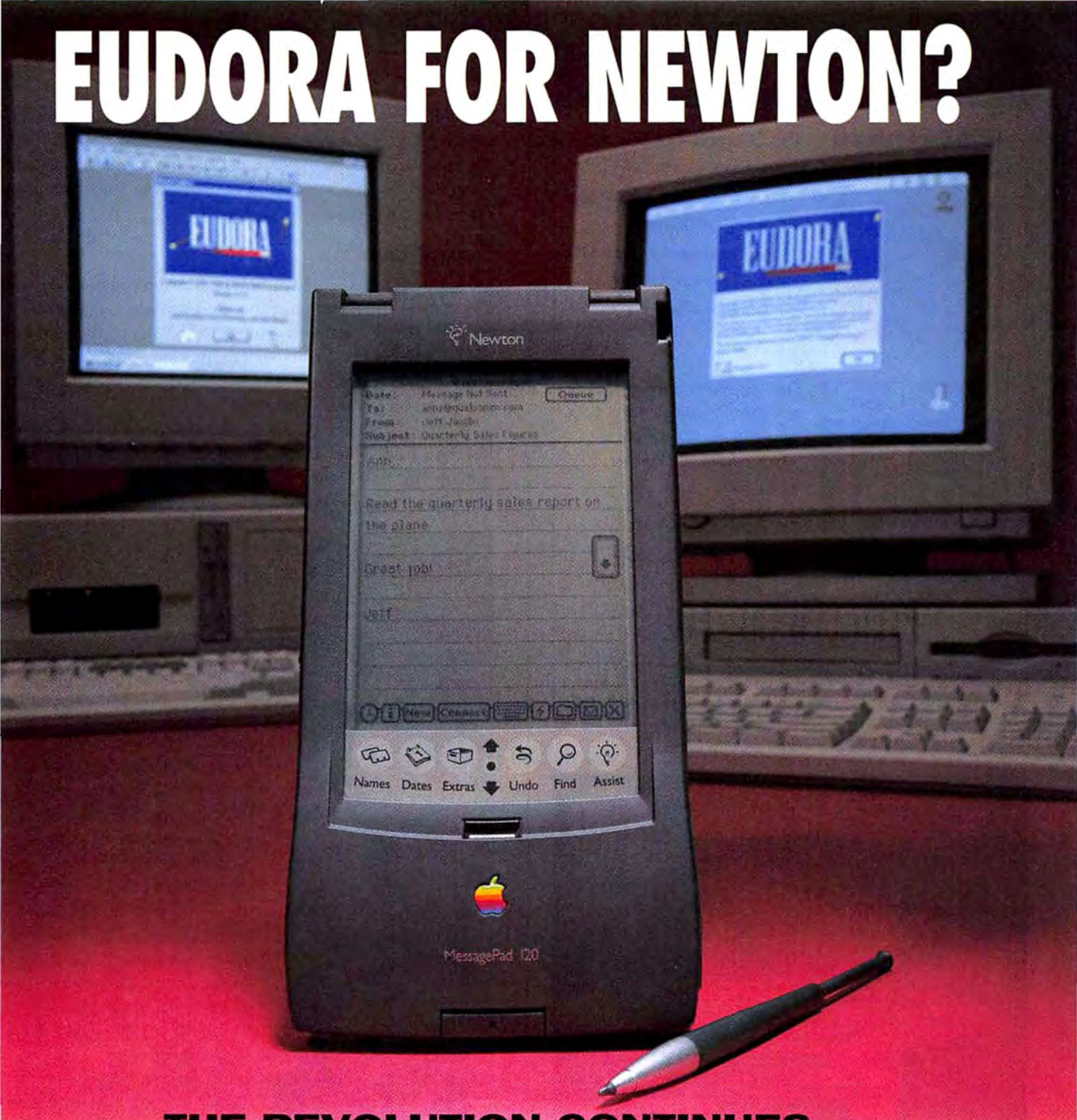
Along with improving the quality of care and reducing paperwork, Pocket Doc allows physicians like Dr. Adamson to move information to and from a personal-computer-based patient record. For example, when performing a consultation at a hospital, a doctor can easily download information from the hospital's server to access a patient's history of medications and lab records. "My PDA has already paid for itself in documentation costs," says Adamson.

Dr. Adamson says that, computer novice that he is, he's one of the first family physicians he knows to have embraced this black bag of the future. In fact, he's ready to leap even further into the 21st century. "I'm asking my wife for a MessagePad 120 loaded with Newton 2.0 for Christmas."

Leslie Crawford

C. J. WALKER

EUDORA FOR NEWTON?



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For information on obtaining Eudora Pro, call **(800) 2-Eudora ext. 6097** *or send e-mail to eudora-sales26@qualcomm.com. Eudora Light for Newton is available from QUALCOMM Incorporated via Worldwide Web at http://www.qualcomm.com/quest.*

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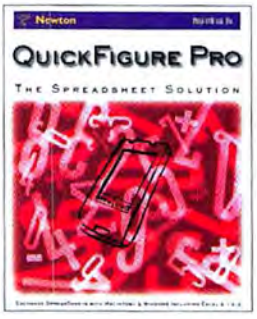

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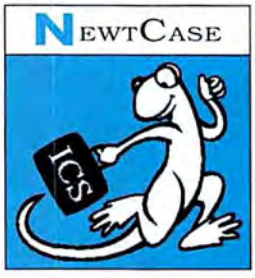

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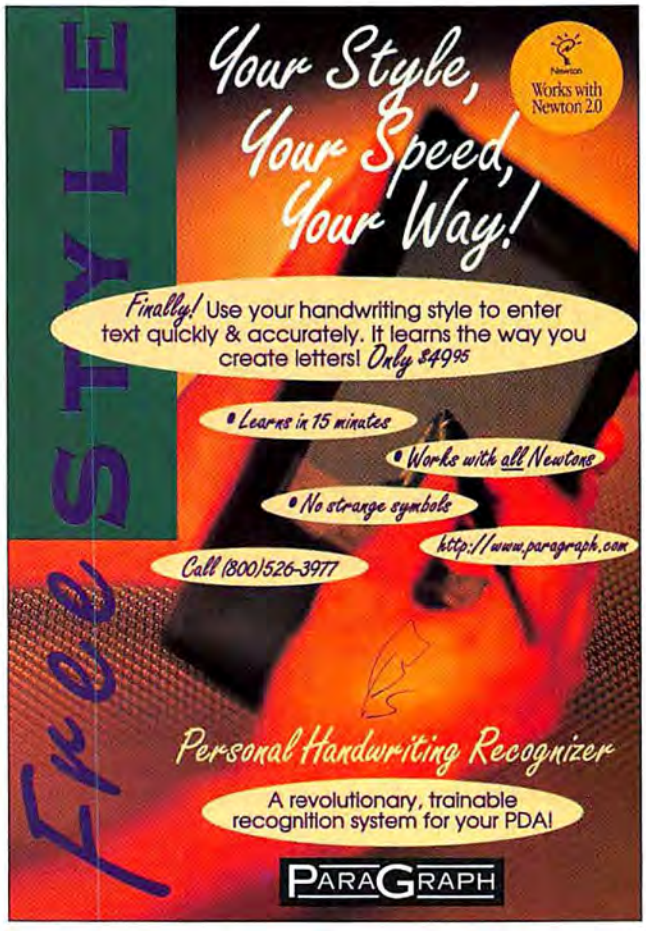

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Sure, Newton is easy to use, but not *that* easy, and context-sensitive help, a feature of almost every PC application and OS, was completely absent in Newton 1.0. With the new, improved Newton, you can access brief, but useful help guidelines from within each application.

Walking the Wires

Capturing data is only part of the Newton equation: the rest is managing and communicating. Resident fax, E-mail, and infrared beaming capabilities connect the PDA to the world at large. Apple has made communications a big priority with Newton 2.0, with plans to release new products that will give it greater access to the on-line world.

Newton's resident eWorld E-mail software—formerly, confusingly called NewtonMail—is still there in the new operating system. But unlike the old client, which logs on to eWorld, batch-downloads incoming E-mail, and then hangs up, the new

NEWTON'S READY FOR THE WORLD, BU

Vertical markets such as health care, field service, and sales-force automation are turning to Newton as a mobile solution. In those areas, a laptop's size, keyboard, and boot-up time can hinder rather than help productivity. There are already more than 300 applications aimed at these vertical markets, Apple says. The first Newton, while flawed, demonstrated that the technology is viable, says Steve Capps, an Apple Fellow and chief Newton programmer. "We always believed in this product. We wanted to prove that it's worthwhile to carry something small like Newton around."

But whether ordinary consumers will belly up to the Newton bar remains a more open question. The reason, conservative voices note, is that Newton is the platypus of the mobile market, a tricky animal to define. As such, it's not yet clear where Newton fits into the mobile computing mosaic. "It falls somewhere between a notebook computer and an organizer," says BIS Strategic Decisions senior analyst John Hulak.

software lets you maintain a connection and select only those messages you want to download. eWorld is Apple's commercial on-line information service; Newton gives you access only to an E-mail component through which you can exchange messages with anyone on the Internet.

Although fine for E-mail, eWorld isn't nearly as popular as other on-line services. Fortunately, you can now use Newton to access mail on other services, including America Online, CompuServe, and even FirstClass bulletin board services. Also in the works from Apple is Newton software for TCP/IP, the protocol of the Internet, which will allow developers to create a new breed of Internet-savvy Newton applications. (I personally think that a World Wide Web browser for the Newton could be a hot application, considering the Web's popularity right now.) You can use the new Newton to receive, as well as send, faxes.

Some analysts consider wireless communications to be vital to the future of PDAs. Right now, the wide area wireless data

IS THE WORLD READY FOR NEWTON?

Users, too, have differences of opinion on just what the Newton is. "Newton is an instant access device," says Newton 2.0 beta tester Todd Wilson. "It differs wildly from a portable computer like a PowerBook." Others see it as an information-gathering device. "For notetaking, Newton is the way to go," says Jeff Goldman. "If you're not doing spreadsheets, I don't see the need for schlepping 5 pounds of computer around. I got rid of my PowerBook 180."

The difficulty in defining just what a PDA like Newton is makes it tricky to sell, even to a potentially huge market. Though the consumer market for PDAs isn't "there yet," according to Hulak, the buying public is nevertheless hog-wild on the notion of smallness—or at least mobility. In their personal and professional lives, people are on the go and bringing information with them. According to BIS Strategic Decisions, 25 percent of all personal computers now sold are laptops, appropriate for "big" tasks like assembling a presentation, number-crunching a spreadsheet, or writing a report. But Newton, because of its size, is better suited to applications like recording information and E-mail access. And the market potential for this smaller variety of mobile computing appears vast, with more than 44 million people in this country defined as mobile workers, according to a recent BIS survey.

Still, the question remains: are you ready for Newton? The $699 price tag of the MessagePad 120 with Newton 2.0 is about what previous versions have cost, but may be too pricey for you to take the plunge. Nevertheless, if you've got a life that needs organization and some intelligent help, if you want to stay mobile and stay connected, Newton 2.0 may be an investment worth making.

2.0 Compatible

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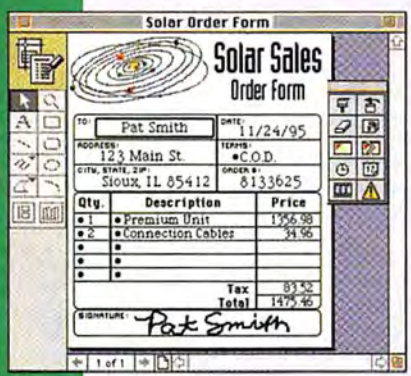
FORMS AND DATA FROM YOUR COMPUTER TO YOUR NEWTON
FROM YOUR NEWTON TO YOUR COMPUTER

Eliminate paperwork and expedite data collection. PowerForms gives you the ability to create custom data-entry forms on either a desktop computer or directly on a Newton Personal Digital Assistant (PDA). Forms and information collected in the field may then be exchanged between the PDA and your desktop.



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Circle 150 on reader service card

industry suffers from high prices that make it too costly for most users. Still, a number of hardware peripherals can connect Newton 2.0 users to two-way wireless local area and wide area networks, and these may come in handy as wireless communications technology improves.

Desktop Connections

Most early adopters learned very quickly that Newton doesn't replace the PC, but rather augments it, emphasizes Jon Hulak, senior analyst at BIS Strategic Decisions, in Norwell, Massachusetts. "You still want to connect back to your main computing environment on the desktop. That's where most of your PIM data resides," argues Hulak. For this reason, connectivity between the PDA and the desktop is critical, so that you're not maintaining a separate address book on each.

A new version of the Newton Connection Kit for Newton 2.0, called Newton Connection Utilities, lets you back up your Newton data to the Macintosh or other PC via modem, as well as providing serial cable and LocalTalk connections. To tap into the market of desktop PC users, Apple has also provided third-party software vendors with tools that let users keep corresponding files mutually updated, so changes made in one are reflected in the other. For example, Now Contact and Now Up-to-Date, two PIMs ($99 for both) for the Macintosh from Now Software (800/275-1669) include Newton synchronization features.

Although Apple has made some impressive changes to Newton software, there's significant room for improvement in other areas. The company's current Newton hardware device, the MessagePad 120, is screaming for some built-in communications features, such as an integrated modem or a pager. And although Apple's optional keyboard for Newton is fantastic, it's far too large to fit into a standard Newton carrying case. Still, these faults are dwarfed by the gigantic improvements in the operating system.

Calls, new to Newton 2.0, keeps track of telephone calls, including names, dates, and durations, and lets you make notes as well.

Another Look

Despite all the savage criticism the first Newton received, one publication, *Microprocessor Report,* managed to lift its head above the negative hype that followed Newton's release. In a September 13, 1994, editorial titled "The Birth of a Platform:

a Ph.D. for Your Newton

- proCALC Ex™
  Count on this program to give you all your calculations.
- FreeStyle™ *
  Learns the way you write so you will write no wrong.
- Quicknames Pro™
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  A timely solution to synchronize your Newton with Microsoft® Schedule+.
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Also available from:
NewtonSource Personal Power Outlet
800.Newton.1

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Launch of Apple's Newton Is a Watershed Event," editor Michael Slater wrote, "With the hectic pace of the computer industry, it's easy to become jaded and cynical about new products. The first Newton product is easy to criticize. . . . But the emergence of Newton should not be mistaken for just another new product. It is the birth of a platform—an event likely to have great significance for the future of computing."

The reason? Newton has the upper hand when it comes to true go-anywhere computing. "Standing with a PowerBook in front of someone isn't socially acceptable," says Todd Wilson, a graduate student at a major research university and Newton 2.0 beta tester. In his professional life, attorney Goldman has the same experience. "When I'm in court with a laptop in front of me, it blocks me from the person I'm supposed to be looking at. Newton is less socially intrusive."

That's the beauty of Newton: It's computing, but doesn't feel like it.

Nick Wingfield is a reporter at InfoWorld *who specializes in the Internet and wireless communications. He can be reached at nick_wingfield@infoworld.com.*

WHERE TO BUY

GET 'EM WHILE THEY'RE HOT

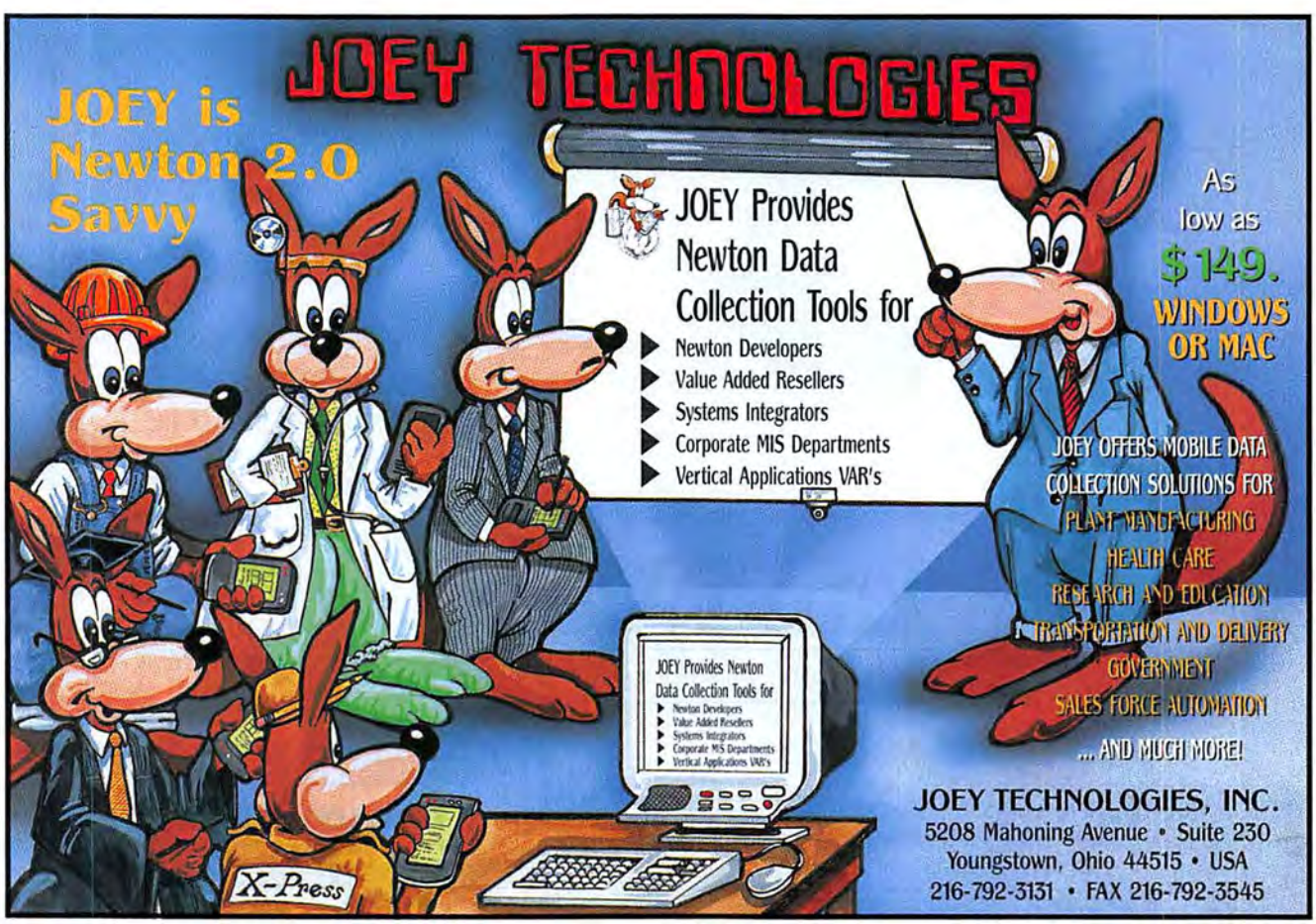
For information about purchasing a MessagePad equipped with Newton 2.0, call the Newton Source line at 800/639-8661, or visit one of the following Newton Source stores:

210 Sutter St.
San Francisco, CA 94108
415/986-6689

1145 Westwood Blvd.
Los Angeles, CA 90024
310/208-6266

2 West 58th St.
New York, NY 10019
212/688-0491

Opening in late November:
161 North Clark St.
Chicago, IL 60601



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Now that TACO BELL'S® auditors use FormLogic™, they can compile inspection results in the time it takes to make a bean burrito.

(Hold the onions).

When Taco Bell Corp. ("Taco Bell")– an industry leader in fast food preparation, and Audits International were looking for a way to streamline the restaurant chain's quality inspection process, they turned to Wright Strategies' FormLogic. The powerful form-generating, data-reporting software allowed Taco Bell to move from paper-based inspections to much speedier electronic inspections, using the Apple MessagePad.

Now using a preprogrammed form that's extremely easy to navigate, auditors can evaluate more than 150 items, like food temperature and holding time. Using the MessagePad's stylus, they simply select the appropriate responses on the form and the report is completed in minutes.

The result is reduced paperwork, decreased response time, lower inspection costs, and vastly improved consistency. And instead of waiting weeks for inspection results, now each restaurant receives a report at the conclusion of the audit. Information is uploaded from the MessagePad to the company's database in minutes making report generation a snap.

To find out how easily FormLogic's efficient form distribution and data retrieval solution can integrate with your existing system, contact Wright Strategies at 1.800.666.1228. Maybe we'll even spring for some take-out.

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WRIGHT STRATEGIES

http://www.wrightstrat.com

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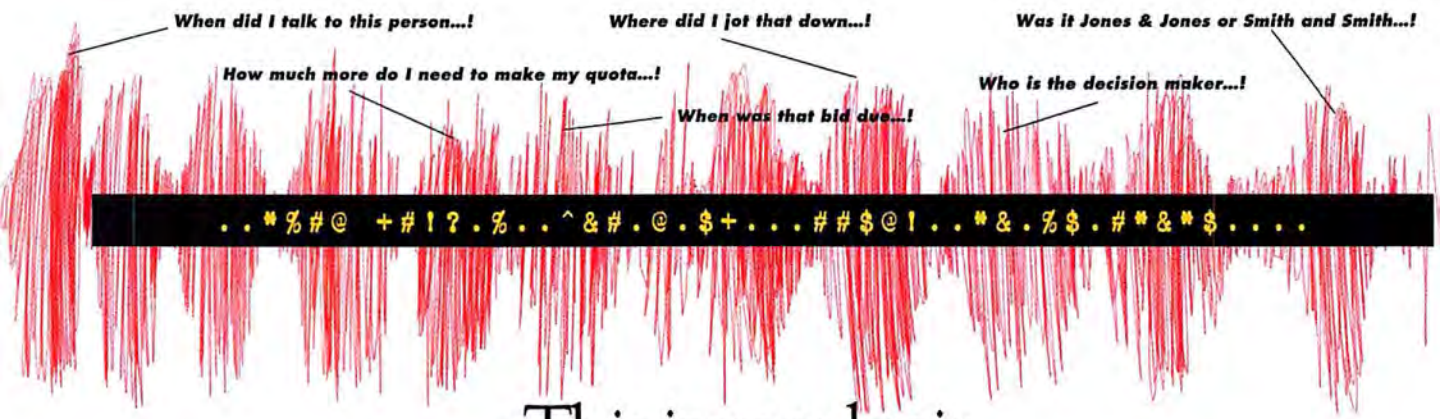

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It runs on the ultra-portable Apple® MessagePad™ (and other PDAs equipped with the Newton™ 2.0 Operating System) so it fits in your hand, pocket, purse or briefcase. Desktop computers are terrific tools for organizing and managing impossibly large volumes of data… that is, as long as these tools are readily accessible *and* convenient.

The Apple® MessagePad™

*The developers of SalesForce™

Locomotion™ on the Apple® MessagePad™ can be used anywhere to record, manage, organize and access information quickly and easily with its very powerful linking and searching capabilities.

Locomotion™ can easily exchange and *synchronize* any or all of its information with Elan Software's™ GoldMine,™ the consistently top-rated contact manager for stand-alone and enterprise-wide Windows® based PCs. And with the Newton™ 2.0 enhanced communication capabilities, **Locomotion**™ provides remote access to the information stored within GoldMine™ whether it's in your own PC or in the corporate server.

Take this opportunity to give your brain a break…

Call PenUltimate™ at **714-442-6700** or FAX a request to 714-476-8411 to receive information about **Locomotion**™ on the Apple® MessagePad™ with links to GoldMine™ – a *truly mobile* business information management solution.

Available Early '96!

Locomotion™

Link-Optimized Contact and Opportunity Management for Professionals in Motion!

PenUltimate™ SOFTWARE SOLUTIONS FOR MOBILE COMPUTING

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New

ADVANCES ON NEWTON APPLICATIONS

No room for a notebook? That's no excuse for sloughing off that spreadsheet or postdating your expense report. Here's a selection of new pocket programs that you can use in the skinniest of circumstances.

BY STEVE MANN

I used to loathe business traveling. I invariably missed an appointment or lost the phone number of someone I absolutely had to talk to. The worst part came at the end, when I had to transform the huge pile of hotel bills, taxicab stubs, restaurant receipts, and other scraps of paper into a tidy, accurate expense report.

Fortunately, I've discovered tools I can take along that keep me both secure and solvent without my having to worry about dislocating my shoulder lugging a laptop around. Here's the skinny on a slew of new applications designed for the Newton 2.0, along with a sneak peek at some software in the works for the portably minded.

Managing Your Money, Minutely

POCKET QUICKEN
A bundled-in, minimalist version of Quicken for mobile professionals.
Intuit 800/243-4650

If you'd rather deal with your financial tasks in small, easy-to-swallow bites than in fattening, filling ten-course meals, Pocket Quicken, a program that comes bundled with Newton 2.0 MessagePads, may be just the ticket. This slimmed-down version of Quicken gets you up and running on your accounting activities with a minimum of fuss.

You can set up accounts for your cash, credit cards, checkbook, or other money matters and enter data as you go. If you categorize your purchases by activity, you can define a category, such as "Vacation," and group all your vacation expenses in one area, or you can report by date range—say, from August 1 to August 12. To save you the headache of setup and data entry, a modifiable QuickList gives pop-up views of the most common expense types, such as restaurants, hotels, and auto rentals.

Unlike the full-fledged desktop version, which offers a wide range of reporting types, Pocket Quicken offers just four different simple types of reports (account, category, expense, and income) with optional date ranges. But for most mortals, this limited reporting is more than enough.

By connecting your MessagePad to a printer, via the serial port or a network connection, or to a fax modem, through the serial port of the PC card slot connected to a phone line, you can print or fax any report. When you want to synchronize your pocket reports with the big brother version running on your desktop, you can use a utility called Quicken Connect. This software automatically synchronizes your desktop data with the stuff in your pocket and then downloads the updated file to your PDA. (Unfortunately, Connect has no option for downloading your Quicken data to Pocket Quicken when you first set it up.)

On the other hand, if you'd just as soon not think about your money at all, Newton leaves you with a nice alternative. Because the program is stored in RAM, you have only to delete it to make room for something more amusing, like Solitaire.

A PDA version of Quicken, Pocket Quicken lets you manage your income, accounts, and expenses while you're on the go.

Newton Software Development

AllPen® Software, Inc. specializes in custom software development for Apple's Newton technology. Whether it's a general or industry-specific solution your business requires, AllPen Software can deliver the pen-based software you need.
Our expertise includes:

Experienced in:

- Field Data Collection
- Medical Productivity
- Mobile Inventory
- Sales Automation
- Newton to Mac/Windows Interfaces
- Wireless Applications
- Barcode Interfaces
- Global Positioning
- Newton Internet Connectivity

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Newton@AllPen.com

AllPen works directly with you to tailor software specifically to your requirements

Call for a free consultation and business proposal

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Applications for Newton

To date, more than 300 companies have developed applications for Newton. Some of these include:

GRAFFITI Handwriting recognition software for those with a need for speed, based on a simplified version of the alphabet; once you learn it, the PDA recognizes your handwriting instantly ($79; Palm Computing, 408/848-5604).

FORMLOGIC A forms package providing companies with all they need to create complex data-gathering applications; now available for Newton 2.0. The FormLogic Builder component costs $895; the server component is $1,095 (Wright Strategies; 800/666-1228).

GOFIGURE For people who live by the numbers, this $79 package offers 16 calculators that do everything from figuring out what to pay the babysitter to astrophysics equations (Starcore, 800/708-7827).

MOREINFO This integrated contact manager lets you link names, dates, addresses, and E-mail addresses and put together a contact log. Another package, PowerNames, lets you access frequent contacts quickly. MoreInfo is priced at $59; PowerNames costs $20 (SilverWARE, 508/521-5262).

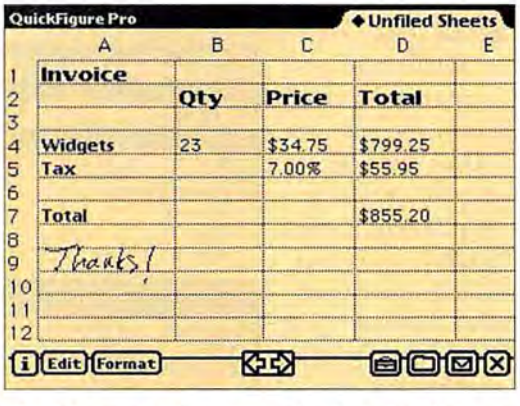
GULLIVER This $49 Newton 2.0–savvy product for frequent fliers provides itinerary management and other travel help. Out of Pocket, $59 (bundled with Gulliver, $89), is a Newton 2.0–based expense application (True North, 800/846-9278).

Small-Minded Spreadsheet

QUICKFIGURE PRO
A fast, simple, but savvy spreadsheet.
$59.95 PelicanWare
800/655-6398

People who carry computers around in their briefcases, hip pockets, or hands are, almost by definition, also interested in speed and ease of use. For such folks, QuickFigure Pro offers a modest, but fast, spreadsheet solution. With an area just a small fraction the size of an Excel worksheet (52 columns by 999 rows, compared to Excel's 255 columns by 16,384 rows), the program makes it easy to enter data. (For fancier formula work, you need to use an entry line.)

QuickFigure Pro offers about 40 financial, statistical, date and time, mathematical, and other functions (including user-defined functions). It supports *if* statements and lets you do row and column lookups. PelicanWare also bundles in tools for sorting, import and export, charting, and matrix manipulations. You can load as few or as many tools as you need, depending on how much memory space you devote to spreadsheet tasks.



QuickFigure Pro is a small but fast program that can handle most common spreadsheet tasks.

One of the few Newton 2.0–savvy applications on the market, QuickFigure Pro takes advantage of some improved features, such as the ability to embed a spreadsheet in the Notepad, so that you can manage your worksheets. You can also select and drag a range of cells to another location. You can conveniently move and delete worksheets from the new Newton storage folder without having to launch the application.

Although it's not the full-featured spreadsheet you might get at the desktop, QuickFigure Pro is a handy way to handle most basic spreadsheet activities.

For Excel-Ophiles

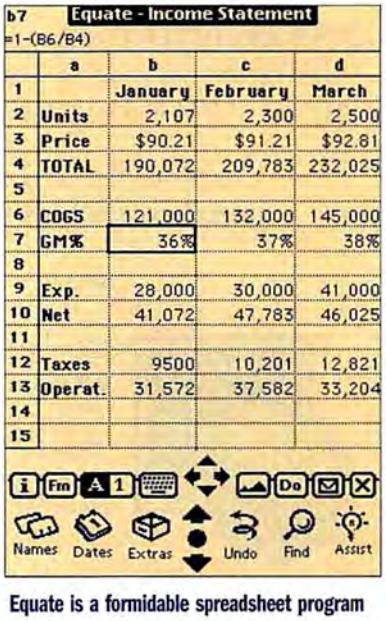
EQUATE
A full-featured, Excel-compatible spreadsheet.
$99 Holosoft 408/748-9648

If you're seeking full desktop functionality in a PDA application, look no further than Equate, a full-featured, Excel-compatible spreadsheet that runs on a Newton. If you're hooked on Excel and want to do your spreadsheeting in the elevator or while waiting for a table at Joe's Eatery, Equate may be a no-brainer.

Equate supports multiple worksheets of up to 16,384 rows by 255 columns. With more than 50 functions, Equate supports Excel 5.0 workbooks, adjustable column widths, and a formula syntax identical to Excel's. You can enter data and formulas directly into cells or erase them using a scrubbing gesture. There is also an Excel-like entry line at the top of the screen, and a special equation keyboard with a Functions Paste pop-up menu.

You can resize columns by pressing on the boundary between two columns and dragging as in Excel, or you can select ranges by tapping on one cell and dragging to another. When you want to reconcile the palmtop spreadsheet with the Macintosh or Windows Excel version running on your desktop computer, you can do so while retaining cross-platform date formats or other formatting you've done.

Equate packs a lot of wallop in a modest-sized package, but its richness comes at a price: Performance is slow at best. And although the larger feature set and Excel compatibility may be appealing to Excel lovers, Equate may really be too rich for the small diet of most PDAs.



Equate is a formidable spreadsheet program that gives you all the features of Excel in a handy PDA format.

GAMBLING WITH THE LOCATION OF YOUR DATA?

FieldWorker™

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Rapid, accurate entry of location tagged data with the tap of a pen.

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FieldWorker provides the serial cable link to any PC or Mac and to any GPS receiver.

Explore the GPS edge at
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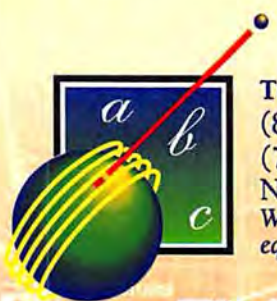

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The GPS Edge in Hand Held Data Collection

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Forms and Function

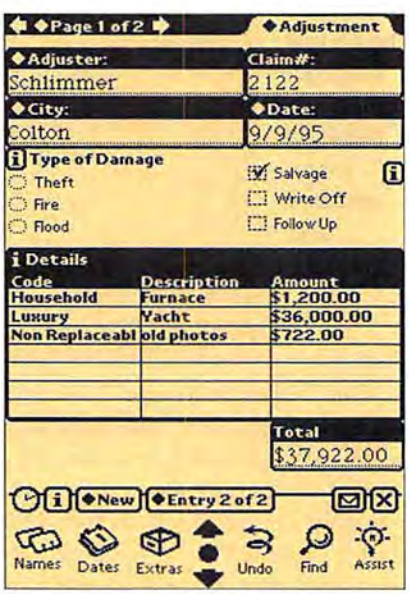
INFORMED FILLER FOR NEWTON
Newton forms client that links to a complete desktop forms management system.
$149 Shana Corporation
403/433-3690

Business forms—sales orders, inventory records, purchasing requisitions, and so on—are ugly, messy, and expensive, and they stink of bureaucracy. Fortunately, electronic forms software takes a lot of the smell away by providing prefilled, customized information and by automatically routing the electronic forms to the next person in line.

Informed, a long-time staple of electronic forms software for Macintosh computers, now comes in a Newton-flavored version that lets pen computing users fill out and route forms with a minimum of headache. Once you create a form on your Macintosh system (or in 1996, on a Windows client) with Informed, you can download it to your Newton MessagePad so that the forms can hit the street when you do. Inventory personnel, for example, can fill out a form created with Informed, then plug in to a network or use a serial connection and upload their results to a Mac for subsequent processing, routing, authorization, and management by the Guys Upstairs.

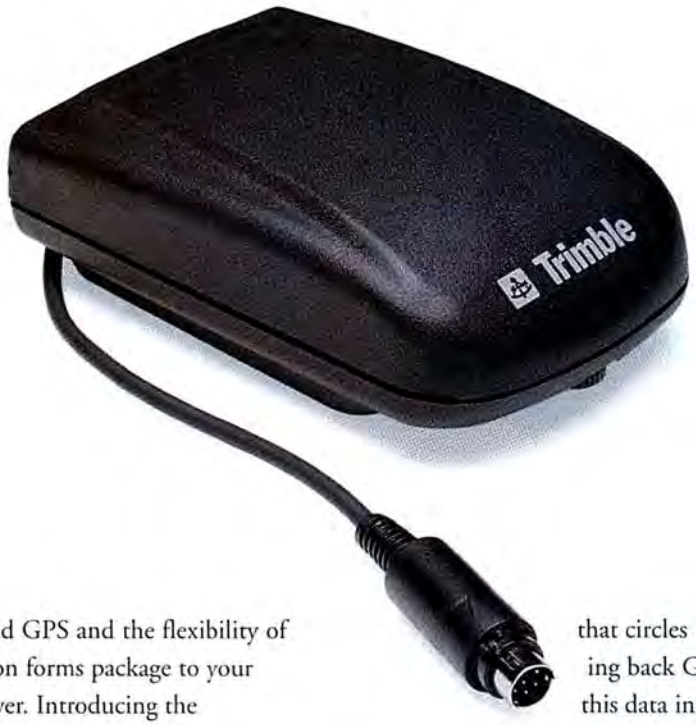
The Informed Filler for the Newton includes support for most Informed data types and features. Forms can have multiple pages, do calculations, and perform error-checking on data that's entered, and the program allows users to search for a form or use the desktop manager to route forms to the appropriate person. Because Informed Filler for the Newton has been optimized for the Newton 2.0 operating system, you can access pop-up calendars for picking dates, times, and phone numbers, or you can use a plug-in keyboard to tab across fields.

While there are a great many so-called forms solutions for PDAs, Informed is the only one that lets you tie into the corporation in a big way. The Informed software lets you track forms by version number, incorporate digital signatures, and even connect to big-gun corporate database management systems such as Sybase and Oracle. Face it—if you have to live with forms, you might as well live Informed.



Informed Filler for Newton, a Newton-flavored version of the Informed forms package, lets you tie into corporate information systems.

Introduce your Newton to the power of Trimble GPS.



If you're looking to add GPS and the flexibility of a robust data collection forms package to your Newton, the search is over. Introducing the FieldWorker™ software package and the Trimble Mobile GPS™ Locator 110.

Combining your Newton with the Mobile GPS Locator 110 allows you to add time and location data to the information you collect with your FieldWorker software.

The Locator 110 is a compact GPS receiver about the size of a computer mouse, that easily attaches to the Newton's serial port. It even provides its own power source, so it won't drain your Newton's batteries. The Locator provides accurate location data using information gathered from the Global Positioning System (GPS). This system is a constellation of 24 satellites that circles the earth continuously beaming back GPS signals. After converting this data into longitude and latitude readings, Trimble GPS receivers like the Locator 110 can pinpoint locations with precise time.

To find out more about utilizing the power of Trimble GPS, or to order your Trimble Mobile GPS Locator 110, call Trimble direct at 1-800-865-4850.

Call NavTech at 1-800-628-0885 (in the US and Canada) or 1-703-931-0500 (outside the US) and ask for the FieldWorker software.

Trimble
THE GPS SOLUTION

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System Requirements: Newton 2.0 O/S (reduced capability with 1.N), The Trimble Mobile GPS Locator 110, and a PC with terminal emulator.

© October 1995 Trimble Navigation Limited. All rights reserved. The Trimble logo is a registered trademark of Trimble Navigation Limited. All other product and company names are trademarks or registered trademarks of their respective owners. TID10813 (10/95)

Programs on the Horizon

NOW SYNCHRONIZE Lets you synchronize Newton Names and Dates files with your Now Contact database and the Now Up-to-Date calendar and scheduling program (Now Software, 800/275-1669).

FILEMAKER PRO COMPANION FOR NEWTON Allows users to create forms and capture data from FileMaker Pro 3.0 database records from a Macintosh. To ship next year, it will provide direct synchronization of modified data between the FileMaker Pro Companion database and the desktop or network database. It also allows users to add NewtonScript to fields in the Newton database (Claris, 800/325-2747).

POWERFORMS Lets you build forms on Macs, PCs, and Newtons for use on a Newton. Upload and download forms and data with scriptable Mac and PC utilities (HealthCare Communications, 800/888-4344).

Fasten your seatbelt,

Newton is flying **Informed**®

Informed Filler™ for Newton means that your data always gets off the ground. The information you collect is sent straight to your Windows® or Macintosh® form. You can change it, sign it, print it, mail it, or...

Using Informed, your Newton data seamlessly fills in electronic forms, right on your desktop computer. From expense, order or survey forms to those specialty forms unique to your business — whether it's insurance, health care...or flying lessons!

Call us at 1-800-386-7244, and get Informed working for you. Or visit our Web Site at http://www.shana.com to learn more about Informed. Or you contact us directly by email (info@shana.com) or by fax at (403) 437 4381

Shana

Taking forms from the desk to the desktop... and beyond.

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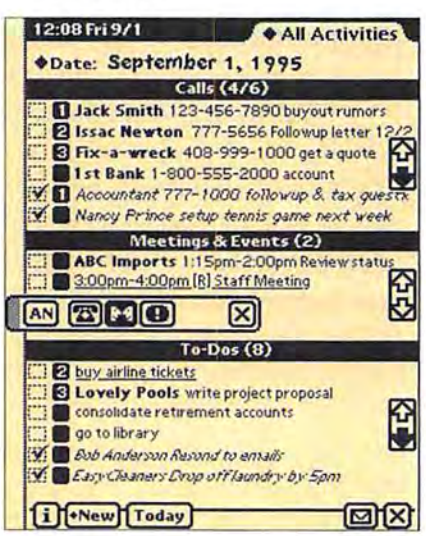
A Desktop for All Seasons

ACTION NAMES
A set of packages that enhances the Newton's built-in applications.
$59.95 Iambic Software
408/985-1723 or 800/730-5370

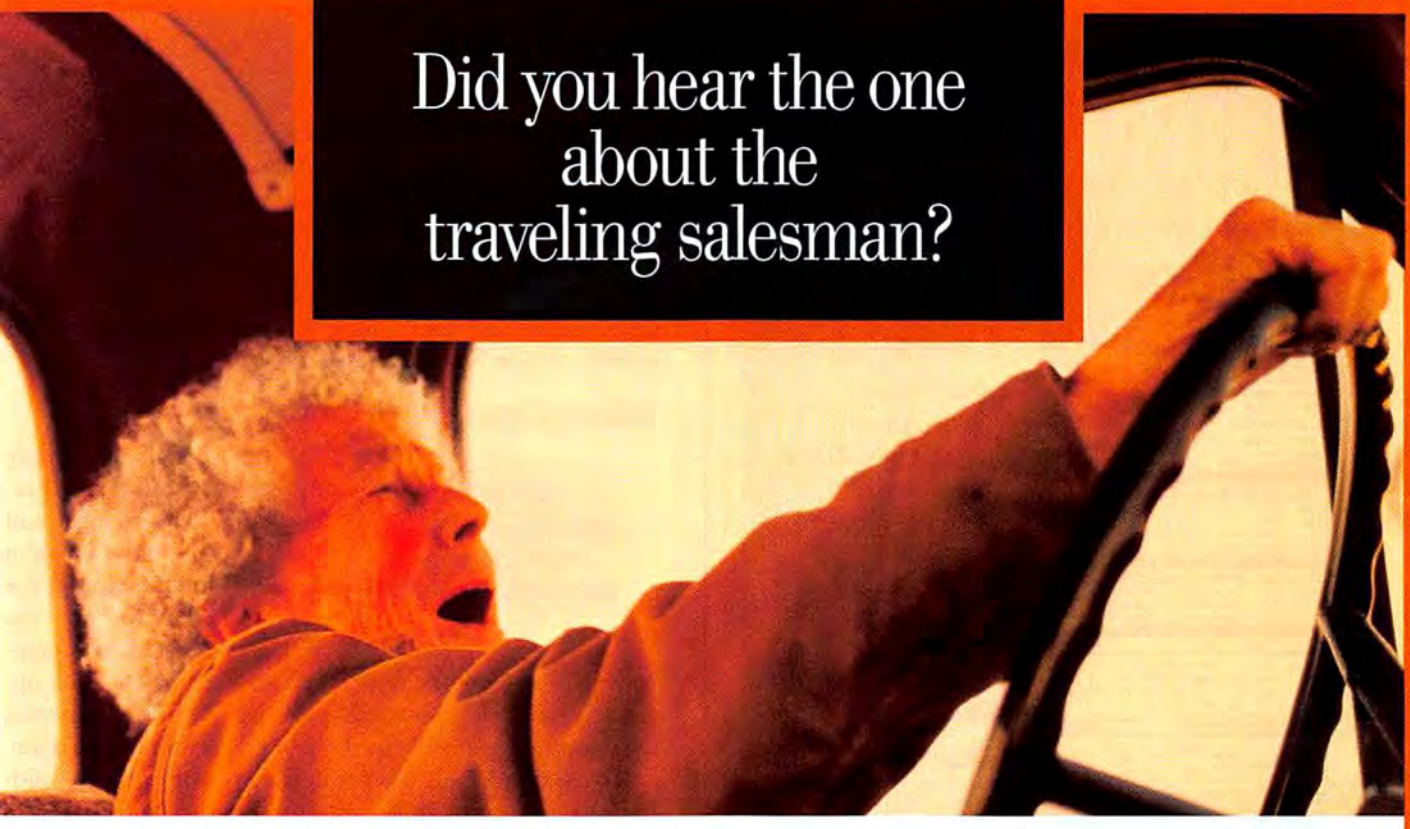
If you want to combine Newton's core applications into one nice, clean all-in-one interface, try Action Names. Designed to radically improve the original Newton built-in Names, Dates, and Notepad applications, this alternative interface combines three different Newton programs and stirs them together.

The latest version of Action Names still provides a simpler, more manageable interface for many Newton functions, even with the improvements to the Newton operating system. For example, a floating toolbar lets you access all your applications, phone numbers and addresses, and other critical information quickly.



Action Names lets you tie Newton's scattered core applications into a clean, all-in-one interface.

Did you hear the one about the traveling salesman?



There's this traveling salesman, Mildred Faber. Midwest sales manager for Kane Communications, Beverage and Rubber Company's Pink Eraser Division. Mistakes are her business. She's spent her life convincing people that they're nothing to be ashamed of. "What do you think erasers were invented for?" she says, in a gravelly contralto.

"I swear, I'd be up the *creek* without Gulliver's itinerary!"

Mildred is the top sales performer of the division (1982-present). She has some help — her Newton®, loaded with Gulliver® and Out of Pocket™. Gulliver and Out of Pocket help her handle all of those annoying travel details that used to make her feel like she was biting off more than she could chew. Hotel reservations, itineraries, flight schedules, expense documentation.

"Expense reports? With Out of Pocket they're *painless*, honey."

Now everything's in her Newton. Gulliver is the reason that Mildred is no longer late for her appointments with Frank, the fussy CPA in Grand Rapids. While he piles his seven No.80 Kane SpeedErase Specials in a neat row on his desk, Mildred schedules their next quarterly appointment. And her Gulliver instantly reminds her of the Tax Preparers' Banquet and Exposition in Flint that very day. "I wouldn't want to miss that one, doll." She's also reminded of her hotel reservation, along with her flight and rental car information. And because she sends her itinerary directly from her modem, her assistant knows where she is and how to reach her all the time. So do her grandchildren. "You never know who needs to talk to Grams," says Mildred. Out of Pocket lets her keep track – with just one self-assured tap – of every stop she makes at Stuckey's, every mile she logs on her faithful Chevy Sierra, and every cup of coffee (ten a day, black) she buys on the way to the next stop. Another tap and she prints out impeccable expense reports, with each purchase and expense instantly categorized and totaled.

"You'll get down on your knees and thank *God* these products exist!"

Reducing work and keeping organized are the best things about Gulliver and Out of Pocket, says Mildred. Plus, they give her time to indulge in her favorite pastime – listening to original cast recordings of Broadway musicals. "I feel pretty-y-y-y," Mildred belts out as Chita Rivera joins in on the road to Dubuque.

True North
Managing your world.

Order your own!

Call 1-800-846-9278 or 1-603-886-2756 / Gulliver $49 / Out of Pocket $59 / Bundle $89

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Gulliver 2.0:
Provides itinerary management, frequent flyer information, travel vendor database, and automated Newton localization. Can enter flight, hotel and car rental information via optional companion desktop application. Newton OS 2.0 compatible.

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Software vendors have finally figured out that expense reports are long on pain and short on gain. Now a host of new PC and Mac programs have made their way onto the shelves of Egghead and CompUSA. Not to be outdone, PowerWare has introduced an upgraded version of ExpensePlus, which lets PDA users keep track of business and personal expenses, for the Newton 2.0 platform.

To use the package, you first define an expense report (which can be a trip, a project, or anything else) then enter expenses in a variety of predefined categories. You can add your own subcategories in the Miscellaneous category, and you can also define folders for different types of related expenses.

The program has many shortcuts for business travelers. For instance, when you enter lodging, it asks you how many nights you stayed and creates a separate expense slip for each night. It also calculates mileage expenses, checks per diem limits in specific expense categories, and does foreign currency conversions.

PowerWare's ExpensePlus is an expense reporting package that helps take the pressure off end-of-the-month reporting.

ExpensePlus doesn't have a lot of report options, but the summary and detail reports it includes are fairly adequate and can be sorted by category. You can also upload your current expenses into Excel on a desktop Macintosh or PC to format it in your corporation's style. And although ExpensePlus doesn't have all the bells and whistles of a desktop spreadsheet, what it does, it does well.

Steve Mann (dsi@cdigital.com) is publisher and editor of PDA Developers, *a bimonthly journal for PDA software developers.*

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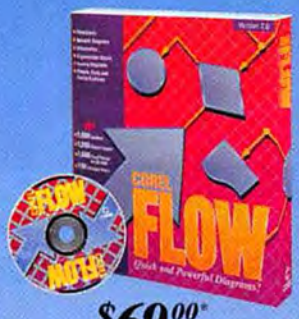

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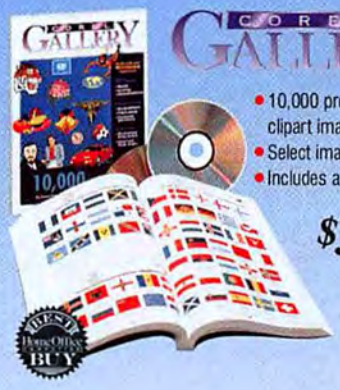

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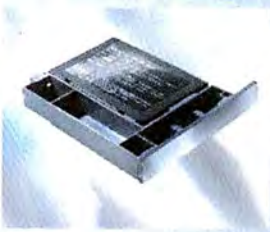

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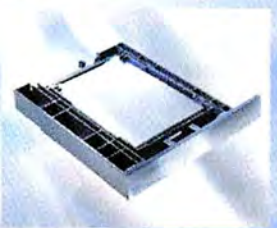

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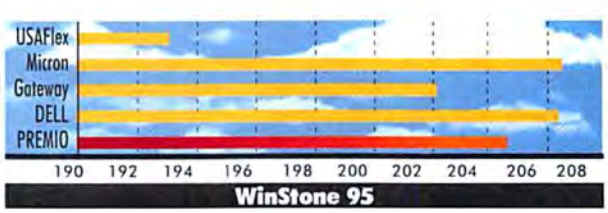

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Here's How

HELP LINE Q&A

Can MemMaker Speed Up My PC?

Q I just bought a 100-MHz Pentium with 16MB of RAM and a 1GB hard disk. I've been reading a lot about using MemMaker to make my PC run better. What exactly does MemMaker do? Should I use it now to make my system even faster, or should I wait until the computer starts lagging?
Andy Evans, Draper, Utah

A MemMaker fills a different system-tuning need, unrelated to speed. DOS and Windows 95 come with a competent memory manager, emm386.exe, that lets you load device drivers and small programs from the config.sys boot configuration files into upper memory blocks. These are unused blocks of memory between the upper limit of conventional memory (640K) and the start of extended memory (1024K). Since making the most of these blocks is a game of guesswork, Microsoft includes an automated memory management optimizer, MemMaker. It won't make your computer run faster, but it will help you run memory-hungry DOS applications, especially games.

MemMaker isn't foolproof, however, and if your system's memory is already tweaked to perfection, running MemMaker could actually result in *less* free conventional memory. To read all the gory details on optimizing memory with DOS's included tools, see "Give Me Back My Memory" in the December 1994 *Help Line*.

It sounds like you have a great system. It probably feels so fast that you wonder whether you'll even notice when performance starts to degrade. Don't worry—the kind of slowdown you describe is typically due to disk fragmentation, which happens when files become broken up and scattered across different parts of the hard drive. Since the hard disk head has to travel farther to read files—especially large ones like program executables, bitmapped graphics, and databases—a fragmented hard disk can result in noticeable performance slumps.

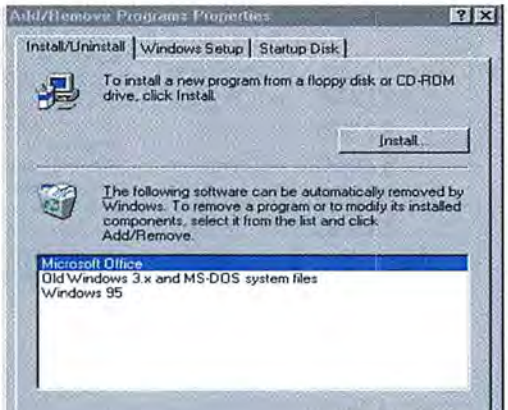
Fortunately, this is easy to fix. Just run a defragmentation utility such as Defrag (included with Windows 95 and with DOS 6.0 and later versions). And while you're at it, run the ScanDisk utility (included with the same operating systems) to look for problems with the hard disk and file system.

Remove All a Program's Files and Settings From Your PC

DEINSTALL OR ADD COMPONENTS TO any application in the Windows 95 Add/Remove Programs dialog box, which you open from the Control Panel. Every application with the Windows 95 seal of approval must come with a deinstallation routine, which removes all the application's files and configuration settings from your system. The Add/Remove Programs dialog box calls that routine in the application you want to remove. On the Install/Uninstall page of the dialog box, select the program you want to get rid of and click the Add/Remove button.

If you made a mistake while you were installing Windows 95—didn't we all—go to the Windows Setup page of the dialog box to change your installation.

To deinstall a program that was not designed for Windows 95, check the program's documentation for a listing of the files that you must remove manually.



STUART BRADFORD

More on CD Labeling

Several readers commented on my answer to Jerry Ramesbottom's question about labeling CD-ROMs ("Slimmed-Down CD-ROM Storage," June). Ramesbottom didn't make clear (and I didn't point out) that there are two kinds of computer-readable compact discs: CD-ROM and CD-Recordable.

CD-ROMs, the kind most of us use, generally have a label printed on the top, and their underside is silver. CD-R discs—used for file distribution, archiving, and backup, and for mastering CD-ROMs before mass production—have a gold underside. CD-Rs usually carry a generic label—belonging either to the disc's manufacturer or to the company that "burned" the disc.

Dave Dondero of Ranchos de Taos, New Mexico, warns never to write on CD-Rs with an alcohol-based felt pen or laundry marker. The alcohol penetrates the acrylic and gold layers and destroys the photosensitive dyes on the underside. Other felt pens pose no threat to CD-Rs, but Dondero recommends marking discs in the small, clear inner ring, where no data exists (see **FIGURE 1**).

Thom Riley of Geneva, New York, thinks I should have stressed the importance of using a soft pen to mark CDs. Riley learned the hard way that writing even lightly on the label (top) side of a compact disc can cause serious damage: After writing his name with a ballpoint pen on several audio CDs, the discs began to skip. You can test this out for yourself if you have an old CD-ROM you don't mind destroying. Write your name on the seemingly hard surface of the disc's label. When you flip it over, you'll be able to see what you wrote in the aluminum layer.

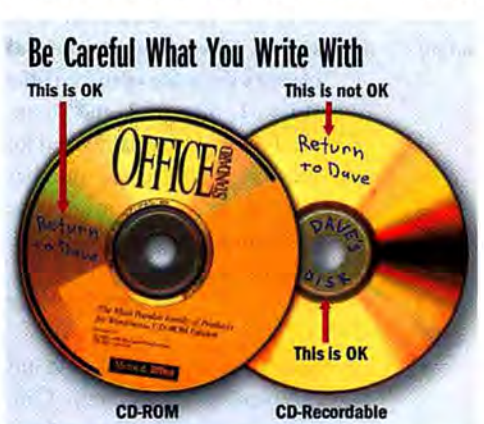


FIGURE 1: TREAT DISCS WITH CARE. Writing on the data area with a ballpoint pen or, in the case of CD-Rs, with an alcohol-based marker is a no-no.

Creating Web Pages in Windows NT

Q I used the Microsoft Internet Assistant to create a Web page for my sister's bicycle shop. The program worked fine on my laptop with Word 6.0c for Windows, but when I took it to the office and tried to install it under Windows NT, I couldn't get it to work. Is there another version of the Internet Assistant for Windows NT? If I buy a package like Quarterdeck's WebAuthor, will it run under Windows NT?
John B. Burger, Glendale, California

A The Internet Assistant runs like a charm under Windows NT, but only if you're using the 16-bit Windows 3.1 version of Microsoft Word. My guess is that your NT system is running the 32-bit version, which doesn't dovetail with 16-bit add-ons like the Internet Assistant. The same also applies to utilities such as WebAuthor (don't try to use it with a 32-bit version of Word).

If your office system does have 32-bit Word 6.0 installed, you may want to consider upgrading it to Word for Windows 95, which would also require you to upgrade to Windows NT 3.51. Then you can download the most recent 32-bit Internet Assistant from Microsoft's Web site, **http://www.microsoft.com**. The 32-bit version of Windows NT doesn't work with 32-bit Word 6.0 because the interfaces are different. If two costly upgrades seem too high a price to pay for a "free" utility, try downloading one of the several low-

Find Answers Fast

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FIGURE 2: ADD ZIP TO YOUR PKZIP FILES by customizing the title page. To make your message stand out, add blank lines at the beginning and end.

cost or free 32-bit HTML authoring programs listed in Forrest Stroud's Consummate Winsock Apps List page, **http://cwsapps.texas.net/**.

Customize PKZip's Title Screens

Q I've noticed that when I decompress certain files, PKUnzip displays a title page of text between the generic PKUnzip banner and the decompression status display. Where does this text come from, and can I put my own title page into zip files?
Alex Eggenberger,
Port McNeill, British Columbia

A You've discovered a little-known feature of PKWare's PKZip file-archive utility: the ability to embed comments that display while files are being decompressed. Many BBSs use .zip file comments to advertise themselves. You can use the option to better identify cryptically named archives. To add a comment to a .zip file, use the command **pkzip -z** *zipfile file1 file2* (where *zipfile* is the name of the archive file, and *file1* and *file2* are the names of the files you want to zip), and enter your text when prompted. To turn an existing text file into a .zip file comment, use the command **pkzip -z** *zipfile file1 file2* **<***commentfile* (where *commentfile* is the file you want to add as a comment). For best results, place at least two carriage returns at the beginning and end of the comment text file, and consider centering narrow text, as shown in **FIGURE 2**.

Batch Files That Pull Strings

Q How do I create a batch file that uses a part of an existing file's name in the creation of a new file name?

For example, I need to archive several files with names like week10-a.dat and week10-b.dat, naming the new compressed file ww10data.zip. I want to use the weekly identifier 10—the identifier is always a two-digit number from 01 to 52 and appears in the same position—to create the new file name. The idea is to create a batch file that does my archiving and cleanup, deleting the original files and moving the new file to an archive subdirectory.
Jim W. Gianelli, Tucson, Arizona

A DOS's batch language is notorious for its lack of string-handling tools: It's easy to sort and select file names using wild cards, but it's nearly impossible to examine, say, the fifth character in a file name and store the results in another file or variable or perform a specific action based on what you find.

But since you know in advance what your strings are (the numbers 01 through 52) and where they are located (positions 5 and 6 in the file name), you can sidestep this limitation with a simple For loop. The batch file iterate.bat (**FIGURE 3**) scans a directory for files that contain the desired digits in the proper location (and checks for other characters you may want to plug into the template, such as the .dat extension). It then moves the files to an archive file whose name contains the same digits. In this example, the working directory is c:\datadir and the archive directory is c:\datadir\archive (you can change these names to match your system's setup).

Since the For loop uses an explicit list of variables to do its work (it replaces the %%a variable with the contents of the list in parentheses, one item at a time, until every value has been used), the obvious solution would be to enter the numbers 01 02 03, and so on, in the list. But besides being tedious, the resulting command line would exceed the 127-character limit.

I have come up with a technique that uses replaceable command-line arguments and the Shift command. The program archive.bat (**FIGURE 4**) runs iterate.bat with a series of arguments that become the second digit in iterate.bat's list of variables (represented by the command-line variable *%1*). After iterate.bat runs through its list using the first parameter (the number 0), the Shift command changes the value of the variable *%1* to 1, then to 2, and so on, until the For loop has looked for files containing every number from 00 to 59. When no more command-line arguments are left, the loop ends.

By Scott Spanbauer

Scott Spanbauer is a PC World *contributing editor.* Help Line *welcomes your questions and tips and pays $50 for published items.* *See page 12 for contact information.*

```
c:
cd\datadir
:top
for %%a in (0%1 1%1 2%1 3%1 4%1 5%1) do pkzip -m archive\ww%%adata.zip week%%a*.dat
shift
if %1x==x goto end
goto top
:end
```

FIGURE 3: OVERCOME DOS'S STRING-HANDLING SHORTCOMINGS with iterate.bat. Instead of listing all 52 variables in the For command, use the Shift command with archive.bat .

```
@echo off
iterate.bat 0 1 2 3 4 5 6 7 8 9
```

FIGURE 4: ARCHIVE.BAT supplies the second digit for the list of variables in iterate.bat's For command.

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SPREADSHEETS Q&A

Sorting Shaded Rows in Excel and Quattro Pro

Q I have an Excel 5.0 workbook that contains a list of teams in an intramural football league and their total points for the season. I'd like to print the list with every other row shaded so that it's easier to read.

But each week, when I sort the list by points, the shading gets sorted, too. Then, before I can print, I must go back and redo the row shading. How can I do this more efficiently?

James Pape, Port Orchard, Washington

A I've got a trick that works well in Excel 5.0 and Quattro Pro 6.0. Create one range name that includes just the odd rows, and another with just the even rows. Then, after you've sorted the list, select each set of rows and set its color. To see how this is done, first enter some sample data: Enter a list of names in column A and a list of random numbers in column B, then follow the steps outlined below and illustrated in **FIGURE 1**. (Note that this technique will not work in 1-2-3, since that program does not let you assign a range name to a collection of ranges.)

1. Select row 2 by clicking on its row number, then press and hold the **<Ctrl>** key and select rows 4, 6, 8, 10, and so on. Select *Insert•Name•Define*, type **blue** into the Names in Workbook box, and click *OK*. Repeat to assign the name **yellow** to the odd-numbered rows.

2. To sort, click a cell in the column of numbers, then click the *Sort Descending* button on the standard toolbar.

3. Now select the cells you want to shade blue: Click the down arrow beside the name box and select *Blue*.

4. Next, click the down arrow on the Color tool and select a light blue. Then repeat this procedure in order to color all of the odd-numbered rows yellow.

In Quattro Pro, the procedure is similar: To name the rows, select them as described above and use the command *Block•Names*. To sort the list, click the *Speedsort* button. To color the rows, click the *Shading* button on the Format toolbar.

Modify Default Settings in Excel 5.0

Q Before I print an Excel workbook, I go to the Page Setup dialog box; turn off the default headers, footers, and gridlines; and center the report horizontally on the page. Is there some way to change the defaults so I don't have to do this every time? And while we're at it, how do I change the default font and number format for all my new worksheets?

Jim Tuckerman, London, Ontario, Canada

A Before I tell you how to change the defaults, ask yourself, Do I really want all my new workbooks to have these settings? If the answer is yes, create a template that has all the settings you want, and save it with the name **book.xlt** in the xlstart subdirectory, which you'll find in the msoffice directory if you installed Excel as part of the Office suite, or in the Excel program directory if you installed it as a stand-alone.

To set up the template, begin in a new worksheet. If you want the new page settings to apply to all sheets in your workbooks, you need to select

them all: Click the *Sheet1* tab at the bottom of the window, then click the right tab scrolling button that's located to the left of the tab, hold down the **<Shift>** key, and click on the last sheet tab (usually *Sheet16*).

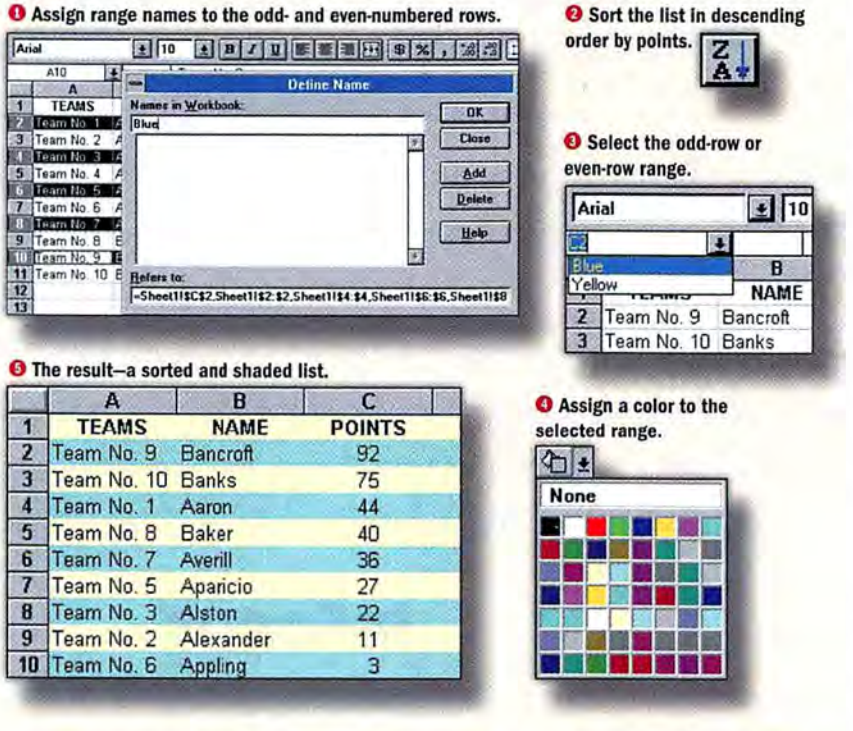
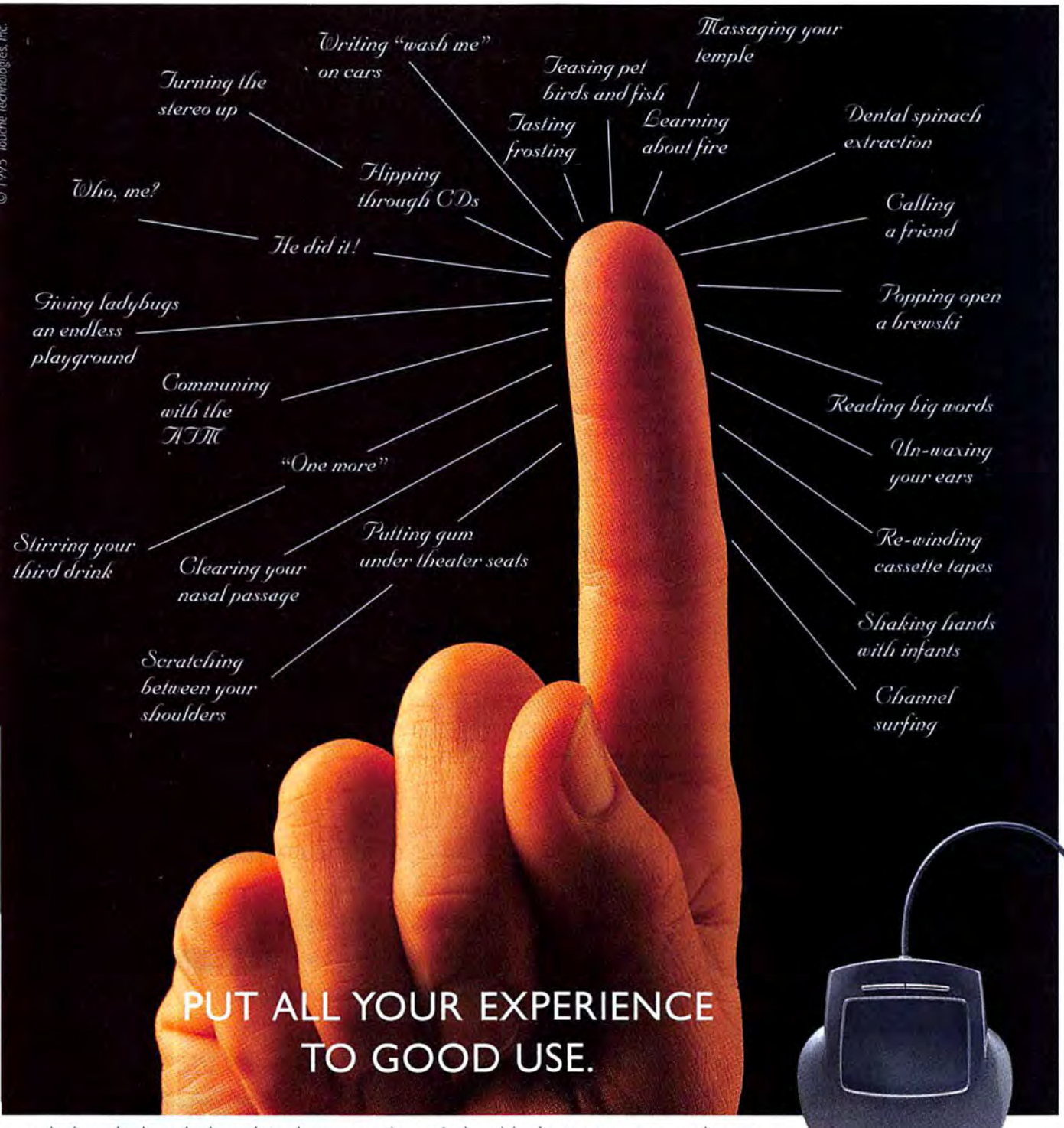


FIGURE 1: SORT A SHADED LIST in Excel 5 or Quattro Pro 6 without sorting the shading. Assign one name to the odd-numbered rows, another to the even rows, then assign a color to each range.



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Now select *File•Page Setup*, click the *Header/Footer* tab, and select *(none)* in both the *Header* and *Footer* drop-down lists. Click the *Margins* tab and select *Horizontally* in the Center on Page section. Then click the *Sheet* tab, deselect *Gridlines*, and click *OK*.

To change the default settings for numbers, fonts, and other formats, select *Format•Style*, select *Normal* in the *Style Name* drop-down box, if necessary, then click *Modify* and make your changes. When you're finished, click *OK* twice. All the cells assume the new formatting.

Save your template: Select *File•Save As;* enter **book** in the File Name box; select *Template* in the Save File as Type list, and specify the xlstart directory.

Suppose you don't want all your new workbooks to have these settings—only your quickie, one-page scratch workbooks. Just save the template with a name like **quickie.xlt** and put it into a directory other than xlstart. When you want to create a new quickie workbook, open the template. You'll get a new document called quickie1.xls with all the page and font settings ready to go. When you're ready to save the workbook, specify a new file name.

Move 2-D Worksheets into 3-D in Excel

Q I'm currently moving old worksheets from Quattro Pro 4.0 into Excel 5.0, and I want to reorganize them to take advantage of Excel's multisheet structure. When I open an old file in Excel, all the data appears on a single sheet; to make the file easier to navigate, I'd like to move sections of it onto other sheets in the workbook.

But when I move a section containing formulas that refer to another section, the formulas lose their references. For instance, if I have a formula that reads =SUM(A1:D12) and I move the data in range A1:D12 to Sheet2, the formula reads =SUM(#REF!). Is there an easy way around this, or must I edit each formula?
Kathy Sherrieb, Arlington, Massachusetts

A Ouch! This is definitely a problem for anyone making the transition to Excel 5.0 from any 2-D spreadsheet—Quattro Pro 4.0 for DOS and earlier, 1-2-3 release 2.*x*, or previous versions of Excel—and Excel 5.0 offers no ready solution. I'll suggest a few techniques that will help, but the best method might be to use another 3-D spreadsheet as a stepping stone to Excel.

One thing you can do is modify all your formulas so they include sheet references. For instance, instead of =SUM(A1:D12), edit the formula to read **=SUM(Sheet!A1:D12)**. If you move this formula or the entire range A1:D12 to another sheet, the formula won't lose its range reference.

To add sheet references, you need to edit each formula, but some selection and editing tricks can help. Try this: Begin by making a backup copy of your worksheet. Then select *Edit•Go To*, click *Special* in the Go To dialog box, select the *Formulas* button in the next dialog box, and click *OK*. Now select *Edit•Replace*, type **(** in the Find What field, type **(Sheet1!** in the Replace With field, and click *Find Next*. Examine the active cell formula on the formula bar; if its first parenthesis precedes a cell or range reference, click *Replace*. ▶

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Continue through all the formulas on the sheet, then repeat the operation, searching for other operators such as =, +, and so on.

But the easiest way to reorganize your 2-D worksheets into Excel 5.0 is to enlist the aid of another 3-D spreadsheet, such as 1-2-3 release 3.*x* or higher, or Quattro Pro for Windows, which accommodates cross-sheet moves much more gracefully. If you can get your hands on one of these products, follow this procedure:

1. Save your Quattro Pro 4.0 worksheet as a .wk1 file.

2. Open the file in 1-2-3 or Quattro Pro for Windows, and reorganize it using the appropriate commands. In 1-2-3 insert the correct number of sheets. In both spreadsheets, use the *Edit•Cut* and *Edit•Paste* commands to move the formulas across sheets. As you reorganize your data, the formula references adjust accordingly.

3. When you finish, save the file in the .wk3 format (in Quattro Pro for Windows, select the file type *1-2-3 v. 3.x* in the Save As dialog box). When you open the .wk3 file in Excel, all your formula references will be intact.

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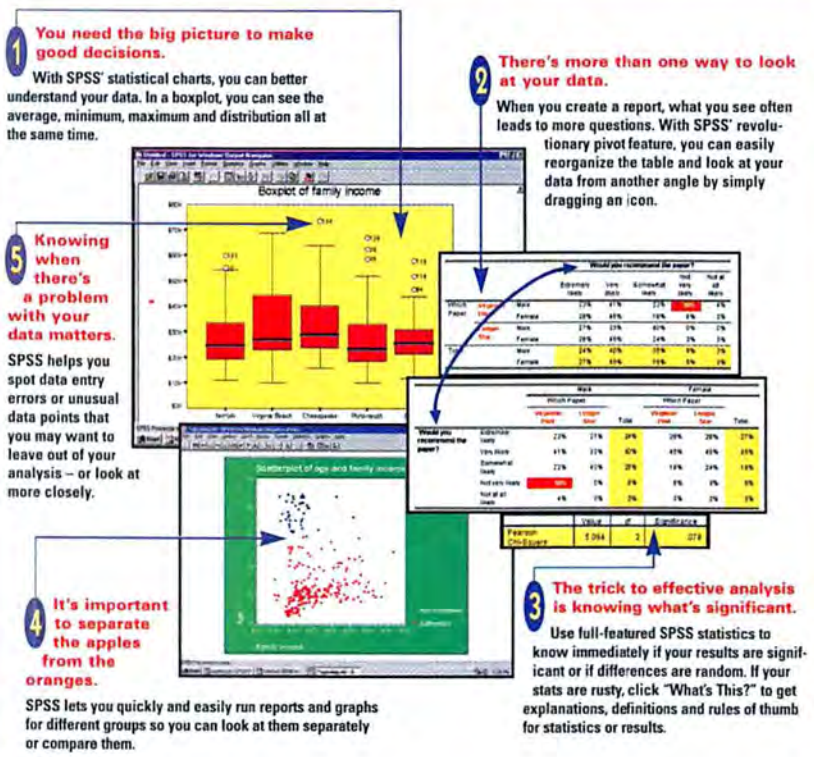

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Control Print Settings With a 1-2-3 Macro

Q I make extensive use of 1-2-3 macros to select various documents with different print settings from the same file, and I've run into problems since upgrading from release 3.1 to 4.0 for Windows.

In release 3.1, I could select the paper tray for individual pages of a report by including the command :PCBU (which stands for the menu commands *:Print•Configuration•Bin•Manual*). These commands are obsolete in release 4.0, and I haven't been able to find an equivalent. Is there a solution?

Bill Anderson, Ontario, Canada

A Unfortunately, I don't know a workaround for release 4.0. You can fix the problem with an upgrade to release 5.0, which lets you control many program settings with its {set} command. (Release 4.0's {set} command allows you to specify page setup options such as margins, but doesn't let you specify the printer bin.)

The syntax is **{set info_component;info_value}**. Info components encompass a wide range of settings, from sort ranges to window control to worksheet defaults. In release 5.0, for example, the command **{set "Printer-setup-bins";"Manual Feed"}** selects manual feed on an HP LaserJet 4.

To learn more about info components, select *Help•Contents*, click *Macros*, and select *Info Components*. Read up on the {set} command, then click *Info Component Categories* to find individual descriptions.

By Richard Scoville

Richard Scoville is a contributing editor for PC World *and a software training consultant in Chapel Hill, North Carolina.* Spreadsheets *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

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WORD PROCESSING Q&A

Changing Justification Defaults in WordPerfect

Q Is there a way to change the default settings in WordPerfect 6.1 for Windows so that whenever I enter text into a new document, it will automatically be justified?
Robert L. Goodman, Lincoln, Nebraska

A Absolutely. Fire up the program, then just follow the steps that are described here:

1. Select *Format • Document • Initial Codes Style.*

2. In the Styles Editor dialog box, select the *Use as Default* check box, then select *Format • Justification • Full* from the dialog box's menus, as in **FIGURE 1.** Click *OK* to close.

From now on, WordPerfect will automatically justify your text. Note that you can change most initial style elements for your documents in the Styles Editor dialog box, from selecting a default font to inserting boilerplate text or a graphic that you want to appear in every new document.

Tab Settings in WinWord Tables

Q I often use tables in Word for Windows 6.0 to help me align text in columnar format. This works fine, but I'd like to be able to indent text within a table cell. Whenever I try to do this by pressing the <Tab> key, the cursor moves to the next column.

Is there a way to insert the equivalent of a tab indent inside a cell?
Ilan Ogen, Internet

A Sure there is. Instead of pressing <Tab>, press **<Ctrl>-<Tab>** to insert a left-aligned tab at the default setting. Once the tab has been set, you can press **<Ctrl>-<Tab>** to move the cursor to the tab stop.

You can also use the horizontal ruler to set tab locations and alignments within tables, just as you do for normal paragraphs. Click the tab alignment box on the far left side of the ruler (see **FIGURE 2**) to cycle through the alignment settings (left-aligned, centered, and right-aligned) until you find the one you need, then click in the ruler segment for the appropriate table column in which to insert a tab stop.

After you've placed a tab stop marker on the ruler, you can drag it to change the position of the tab.

Missing WinWord Fonts

Q I have installed several TrueType fonts on my notebook computer, but I can't use these fonts in Word for Windows. Although they all show up in the Fonts dialog box in the Windows Control Panel, and the Enable TrueType Fonts check box is selected in the TrueType dialog box, whenever I open documents in Word for Windows, all I see are those ugly System, Roman 10cpi, and Courier 10cpi fonts.

I can't use the TrueType fonts in Windows Write, either, but I can use them in Windows Paintbrush.

FIGURE 1: WORDPERFECT 6.1'S STYLES EDITOR lets you set formatting defaults for every new document you create.

Common Name	Locomotor Category	Activity
African bush baby	Vertical clinging and leaping	Leaping in trees and hopping on the ground
Slender loris	Quadrupedalism	Cautious climbing, no leaping or branch running
Sooty mangabey	Quadrupedalism	Climbing, springing, branch running and jumping

FIGURE 2: INSERT TABS IN WINWORD TABLE CELLS by pressing <Ctrl>-<Tab>.

I never print from this computer, but I really want to use those TrueType fonts when I create WinWord documents. What do I have to do to get them to show up?
Lito Carlos, Manila, Philippines

A There's only one reason this font problem could be happening, and it has to do with your default printer setting, of all things.

Judging from the fonts that you *can* see, it's clear you have an old printer that just can't handle graphics. That would account for the short font list, since applications like Word for Windows and Windows Write base their font lists on the fonts that the printer is able to handle.

To solve this problem, you could install a driver for your desktop PC's default printer or for the Hewlett-Packard LaserJet II by following the instructions below.

On your notebook computer, double-click the *Printers* icon in the Windows Control Panel, and in the Printers dialog box, click the *Add* button. Choose *HP LaserJet Series II* from the list that appears, then click the *Install* button. Insert whatever Windows installation disk the system requests, and then click *OK*.

Once the driver has been installed, double-click its name in the Installed Printers list to make it the new default. Click *Close*, and that's it. Your TrueType fonts will now be available in all your applications.

Split Lines in WordPerfect 6.1

Q I need to format some lines of text so that the first part of the line is left-aligned and the rest of the line is right-aligned. I recently switched to WordPerfect 6.1 for Windows from WordPerfect 5.1 for DOS. In the DOS version, I could get this effect just by pressing <Alt>-<F6> between the first and second parts of the line. In the Windows version, <Alt>-<F6> seems to do nothing at all.

Is there an equivalent keystroke combination for the DOS command in version 6.1 for Windows?
Ben Luey, PC World Online

A There is, but I'm not surprised you haven't found it. In WordPerfect 6.1 for Windows, the keystroke command for Flush Right is **<Alt>-<F7>** instead of <Alt>-<F6>. (In WordPerfect for DOS, <Alt>-<F7> takes you to the Columns and Tables menu.)

Type the text you want to appear flush left, press **<Alt>-<F7>**, then type the second part of the line to reproduce that split alignment.

You can get the same effect by selecting *Format•Line•Flush Right* after typing the first part of the line.

Many previous users of WordPerfect for DOS have similar difficulties with the keystroke command changes in the Windows version. There is an easy way to work around this: Switch to the DOS keyboard layout.

To make the switch, select *Edit•Preferences*, then double-click the *Keyboard* icon. Choose *<WPDOS Compatible>* in the Keyboard Preferences dialog box, click *Select*, then click *Close* in the Preferences dialog box, and you'll be able to use all your familiar DOS version keystrokes.

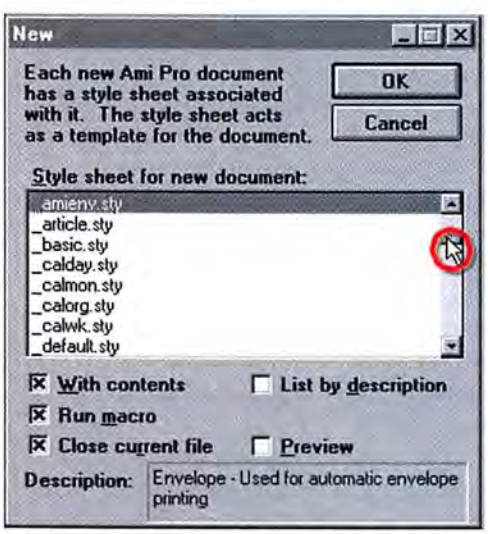

FIGURE 3: YOU CAN FORCE YOUR STYLE SHEETS to the top of Ami Pro's list, but you'll still have to scroll up to display them.

Getting to Ami Pro Style Sheets Quickly

Q I use Ami Pro 3.1 and have created several personalized style sheets for memos, fax cover sheets, and letterhead. These are the style sheets I pick 90 percent of the time when I select File•New. The problem is, I have to scroll down to the bottom of a long list to find them.

Is there any way I can force my own style sheets to appear at the top of Ami Pro's Style Sheet list?
Bill Bryce, Ymir, British Columbia

A No problem, although the fix isn't intuitive. You've probably noticed that Ami Pro's own style sheets all start with an underscore character (_), which gets sorted before any alphanumeric character, so Ami Pro's style sheets top the Style Sheet list.

But you can fake Ami Pro out quite easily. Just use File Manager or the DOS **rename** command to rename your personal style sheets so that they start with an exclamation point (!). For example, if you have a personal style sheet called memo.sty, change its name to **!memo.sty**. Since the exclamation point is sorted before the underscore Ami Pro uses, your style sheets will appear first in the list.

You'll still have to scroll up a bit to select your style sheets, however, because Ami Pro doesn't automatically display that part of the list in the style sheet window. It displays its own sheets first, even if there are other style sheets "above" it (see **FIGURE 3**). But scrolling up a few items is a lot easier than scrolling down through Ami Pro's 50 style sheets.

WordPerfect Batch Conversions in Ami Pro

Q I recently switched from WordPerfect 4.2 to Ami Pro 3.1 and need to convert 811 WordPerfect documents into the new format. Ami Pro supplies a batch conversion macro (called convert.smm), but unfortunately it doesn't work for WordPerfect 4.2. That seems odd, considering that it's one of the file types listed in Ami Pro's File•Open dialog box.

What's the deal? Do I have to convert those documents one at a time?
David B. Evans, Clarksville, Arizona

A This is a great question. Because of a limitation in Ami Pro's macro language, the convert.smm macro can't handle the entire list of conversion filters available in the program. Fortunately, there's a simple solution for your problem. Here's the process:

1. Exit Ami Pro, start the Windows Notepad accessory, and open the file amipro.ini, located in your main Windows directory.

2. Scroll down through the file until you find the section marked '[Filters]', then look for the line that begins 'WordPerfect ver 4.2 ='.

3. Highlight that line, press **<Ctrl>-X** to cut it, then move the cursor back to the beginning of the first line in the [Filters] section and press **<Ctrl>-V** to paste it as the first entry.

4. Close, and save your changes without changing the file name.

Now, run the modified macro by choosing *Tools•Macros•Playback*, selecting the file *convert.smm* in the Play Macro dialog box, and clicking *OK*. Your WordPerfect 4.2 filter will appear in the filter list, although it won't appear as the first item.

By George Campbell

George Campbell is a contributing editor for PC World *and a contributor to* The PC Bible *(Peachpit Press, 1995, 510/548-4393).* Word Processing *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

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After going down to Research and up to Sales and over to Finance I had this overwhelming pile of papers on my desk that were filled with numbers and words and facts and I was having a huge brain cramp. And as I sat there thinking about how to turn all this input into a plan that

Why I sat staring at my computer screen waiting for a divine act of God to figure it all out for me.

would mean something and look cool and inviting instead of boring and dull when I presented it, I realized that I had been sitting there for over two hours just staring at a mountain of information and the only thing I had typed were the words "sales plan and presentation." I figured that at four words every two hours, I wouldn't have this thing done until the year 2000. And that was way past my deadline.

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WINDOWS Q&A

Painless Paths in Windows 95

Q I still do work that requires me to enter commands at a DOS prompt. But now that I have Windows 95, the file paths I type in are either very long (thanks to long file names), or hard to type because of the tilde and number characters if I convert the names to the old eight-dot-three length. Is there a way to save my aching fingers?
Mildred Halvorsen, Saint George, Utah

A There's hope, Mildred, because you can drag and drop those long file paths in Windows 95.

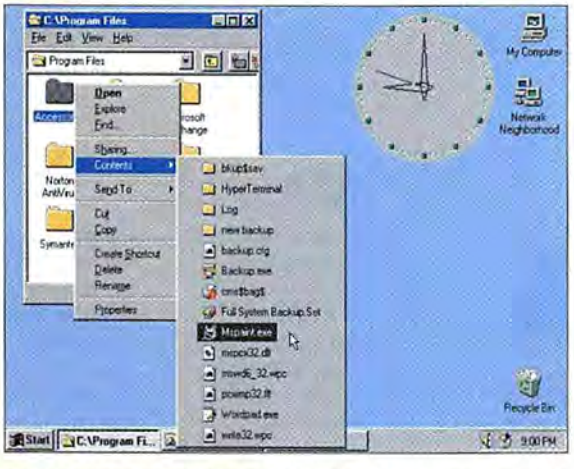
First, type any command you need at the beginning of your command line. If you're not already doing so, press **<Alt>-<Enter>** with your DOS session active to run it in a window.

Then double-click *My Computer* and navigate to the file or folder you need to add to your command line. Drag the file or folder and drop it on the DOS window; the full path of the item you dropped magically appears at the end of the command line.

If necessary, press **<Backspace>** or the cursor keys to back up and edit parts of the path name (for example, to change a file name to a wild card).

This same technique also works with the Run command: You just click the *Start* button and choose *Run*, type a command (if necessary), and then drag and drop your file or folder on the Open box of the Run dialog box. And you can drag and drop more items as needed.

Windows Toolbox: Power Toys



Power Toys is a handful of Windows 95 microapplications that was engineered by the same team that brought you the operating system, although it's not supported by Microsoft. Power Toys includes the traditional Windows Clock utility but with a round face in analog mode (just turn off the title bar). With Quick CD, you can play audio discs on your CD-ROM drive by right-clicking a Taskbar icon. The Fast Folder utility lets you see the contents of any folder as a pop-up menu—just hold down <Shift> as you right-click. And Power Toys adds an Any Folder option to the Send To submenu; Any Folder produces a dialog box that lets you type the path or browse for a selected object's destination. Power Toys is available free as addon.zip on PC World Online and other online services.

Guilt by Lack of Association in Windows

Q I am having a problem with my file associations in Windows 3.*x*. For example, when I double-click an .ini or .txt file in File Manager I get a dialog box telling me that there is no association. When I select File•Associate, no associations are present, and I don't seem to be able to add any.

I have checked my win.ini, and all of the proper file associations are there.

I've noticed that I also have one additional problem: My reg.dat file is corrupted. Could this be the reason for the first problem?
Hugh Brien, America Online

A You guessed it, Hugh. The [Extensions] section of win.ini formerly had the job of storing the associations for Windows 3.0, but in subsequent versions of Windows the section serves only to ensure backward compatibility with older applications.

Newer applications store their file associations and OLE information in reg.dat, Windows' registration database. (Be sure not to confuse this with Windows 95's Registry, which stores even more configuration information.)

The default registration database is not found on your Windows installation disks—but don't worry, you can re-create it pretty easily.

First, since your current reg.dat file is corrupted, locate it in your Windows directory and rename it.

Next, in the Windows File Manager choose *File•Run* and type **regedit /u c:\windows\system\setup.reg** (adjust the path as necessary). This restores the basic Windows and Windows accessories file associations. A message box confirms that the information has been added to the database.

To restore registration entries that were added by other Windows applications, choose *File•Search*. Type ***.reg** for Search For, select *C:* for Start From, and click *OK*.

Then select one of the entries in the Search Results window, and choose *File•Associate*. Associate the .reg extension with regedit, the registration database (it may already be set up that way). Then click *OK*. Finally, double-click each .reg file in the Search Results window. You'll receive a similar confirmation for each; if Windows asks whether you want to update the Search Results window, just click *No*. If any of the .reg files in the window aren't actually intended for the registration database, Windows will detect that, so no harm will be done.

If any of these steps give you difficulty, restart Windows and try again.

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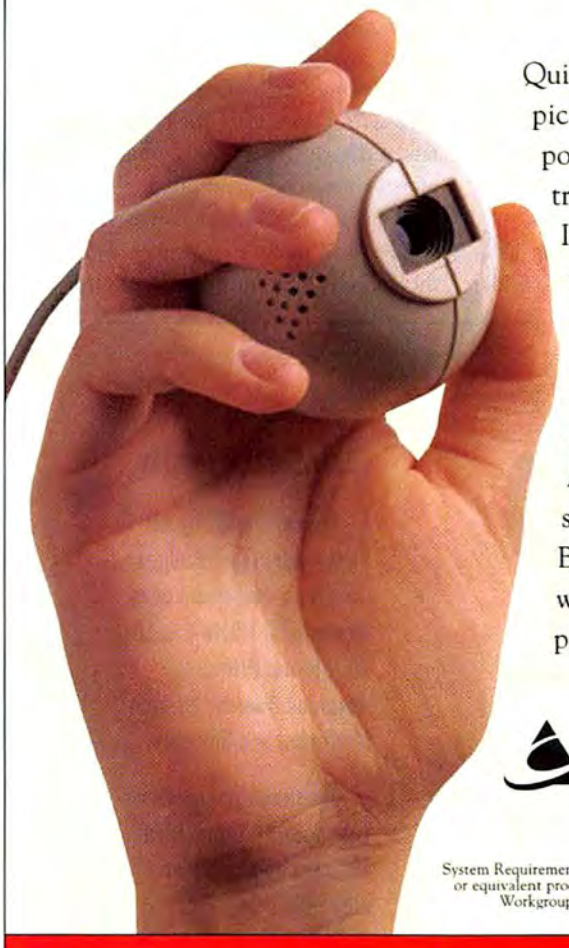

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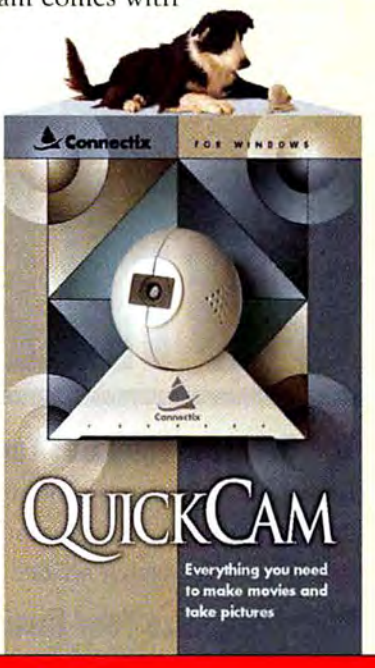

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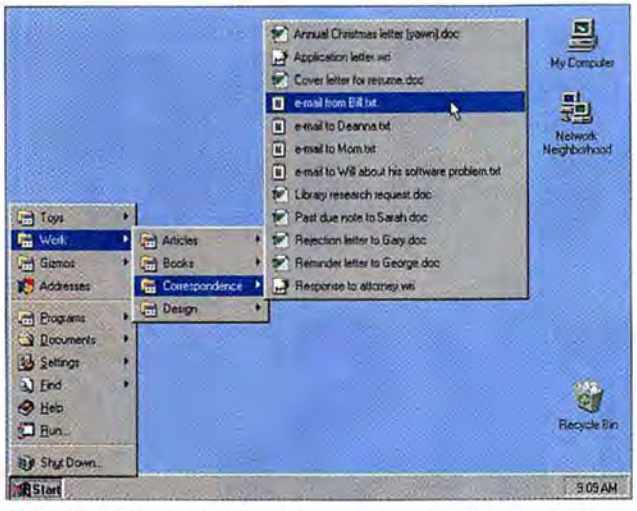

STORING YOUR DOCUMENTS in folders within the 'Start menu' folder gives you a more powerful set of menus that updates itself.

Better Documents Menus in Windows 95

Q I have tried using the Start menu's Documents menu in Windows 95 to open documents that I've recently accessed, but many times the file I wanted was not there. So tell me, what good is this feature?
Sid Delany, New York

A The Documents menu is limited to the last 15 documents you opened, and even then it works only with apps that can communicate with it, unless you open the file in certain ways (such as double-clicking a file in Explorer). For a more sophisticated menu that allows submenus and imposes no limit on number of files, just create your own.

Start by right-clicking the *Start* menu and choosing *Open*. Right-click in the window, choose *New • Folder*, and give the folder a name. You will use this folder to store your everyday work documents.

If you work with many different documents, you'll want to organize the folder further: Double-click your new folder to open its window. Create subfolders here that reflect your own organization scheme; you might want subfolders based on file type (word processing, graphics, spreadsheets, and so on), or you may prefer subfolders for different projects. However you choose to organize your folders, just remember to store all your work here in the future. Now whenever you click the Start menu, you'll see your new folder as a menu and all its subfolders as submenus.

If you still prefer to start your applications using the Programs menu (rather than by opening documents exclusively from your new menu), you can save yourself some time by making one of these work folders the start-up location for your application. To do so, first navigate to the shortcut that launches your program. Right-click it and choose *Properties*. Click the *Create Shortcut* tab, and in the Start In box, type the path of your new documents folder. Since at least one of your folder names includes spaces ('Start menu'), remember to enclose the entire path in quotation marks (for ▶

COMING UP

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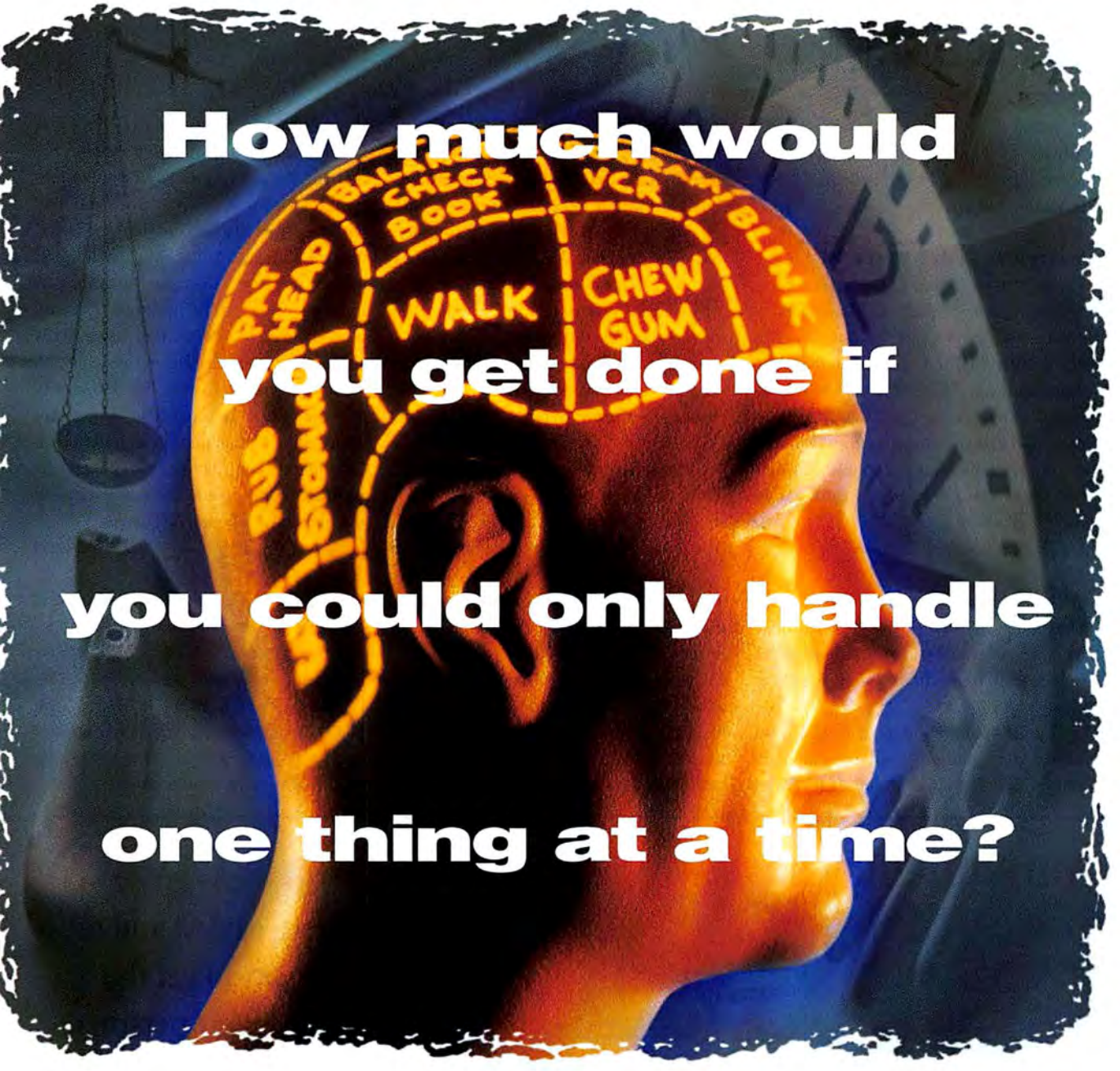

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example, "c:\windows\Start menu\Work\Articles"). Then your application will automatically save your documents in the correct work folder.

Missing Device Driver in Windows 3.1

Q Help! Every time I boot up my computer, I get the message 'Cannot find a device needed to run Windows in 386 enhanced mode. You need to run the setup program again. dva.386 Press a key to continue'. Once I press a key, I get into Windows and everything seems fine. I've tried to run Windows setup a couple of times but I still get this annoying message. Is there any way to get rid of it?
Laura E. Fernandez, CompuServe

A By accident or design, your system is missing a virtual device driver it once had, but system.ini wasn't informed of the deletion. To fix it, either restore the file or change system.ini.

The file your system lacks, dva.386, is a virtual device driver used by Video for Windows (the file name stands for *direct video access*). You may have moved it or deleted it by accident, or you may have been trying to uninstall some program but didn't know how to update the system file references to the program files—a common tale of woe when Windows applications lack uninstall features or documentation.

First make sure you haven't accidentally moved the file somewhere else on your computer where it's taking up space without serving any purpose. In File Manager, choose *File•Search*, type **dva.386** for Search For, select *C:* for Start From, and click *OK*. If you have multiple drives, repeat the search for each one. If you find the file, simply drag it from the Search Results window to the Windows system directory.

If you don't find the file and are convinced your system is running fine, you can eliminate the reference to this file in system.ini. In either File Manager or Program Manager, choose *File•Run*, type **system.ini**, and press **<Enter>**. Under the [386enh] heading, look for a line that reads 'device=dva.386'. Type a semicolon at the beginning of the line to disable it; this makes it easier for you to restore dva.386 if you should happen to change your mind later.

If you later have problems with animation in your Windows programs, you may wish to restore the line you disabled in system.ini and return dva.386 to Windows' system directory. Since any program that has animation problems probably came with the dva.386 driver, the easiest fix is simply to reinstall that program.

Finally, remember that dva.386 is only one piece of a larger puzzle. If you are uninstalling a program that includes video capabilities, you may need to contact its manufacturer to ensure that you remove all the files and system.ini references.

By Scott Dunn

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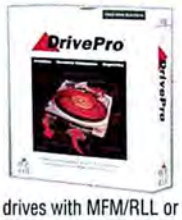

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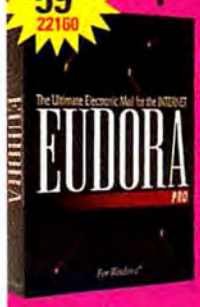

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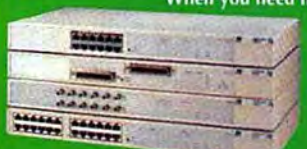

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WINDOWS 95 ADVISER

Getting Your Fax Right

If you're like me and have never gotten around to buying fax software, save your money. Windows 95's Microsoft Fax—unlike its abominable predecessor in Windows for Workgroups—is good enough for most of us. And even better, it lets you send faxes from any PC on a network.

Microsoft Fax isn't installed by default. Go to the Control Panel, double-click *Add/Remove Programs*, click the *Windows Setup* tab, and check the *Microsoft Fax* box.

Insert your installation disk and install both Fax and the Exchange e-mail client, which together take 6.4MB of disk space. (You may not think fax and e-mail are necessarily related, but Microsoft does, so the fax setup is part and parcel of the Exchange setup.)

Your system will reboot, and eventually you'll end up in the Exchange Inbox Setup Wizard.

When asked what to use to send faxes, check *Modem connected to my computer*, and in the following 'Add a fax modem' dialog box, check *Fax Modem*. Win 95 will try to detect your modem or let you pick it from a list. Once your modem is installed, you're ready to send or receive faxes from that PC.

To share your fax-modem with the poor modemless souls on your network, you must first set up a peer server for sharing files. Why? Because Windows 95 copies the sender's fax to the hard disk of the PC with the modem before transmitting it.

Windows 95 has two flavors of peer servers—one for Windows networks and one for NetWare. To install, go to the Control Panel, double-click *Network*, click the *File and Print Sharing* button, click *Give others access to my files*, then reboot. (Here's an important caution for NetWare users: Check with your network administrator before doing this, because you may cause major network problems if this isn't configured right. And in any case make sure print sharing is disabled.)

Windows 95's built-in faxing is good enough for most of us, and it even lets you send faxes from any PC on a network.

Now you can set up your fax-modem for sharing. Return to the Control Panel and double-click *Mail and Fax*, then double-click *Microsoft Fax* to bring up the fax properties sheet, which you can use to change a myriad of configuration settings.

On the *Modem* tab, click the box next to *Let other people on the network use my modem to send faxes*. Leave the default name for the shared directory—FAX.

Once you've set up your fax-modem for sharing, you can install Microsoft Fax on PCs without modems. Go through the same steps as previously described, except when asked what to use to send faxes, check *Network Fax Service*, and in the 'Add a fax modem' dialog box, check *Network Fax Server*.

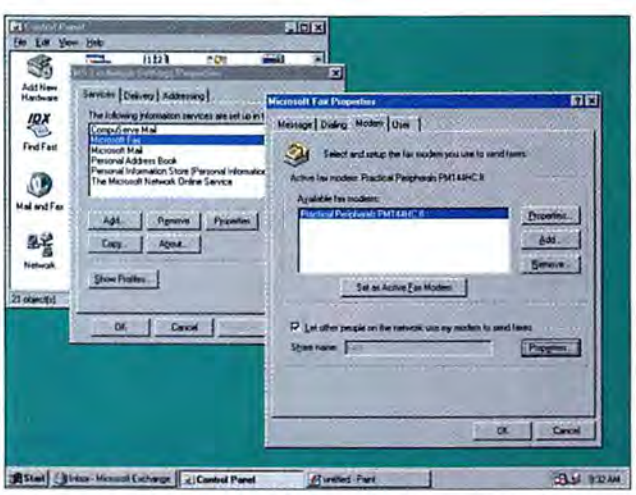
You then enter the network path of the shared fax directory, which must be in the form *computer**share*. If the PC with the shared modem is named, say, richard, then the path would be \\richard\fax. (Don't use a network drive letter like Q. This is Windows 95, and network drive letters are passé.)

You can now fax from any PC on your network whether or not that computer has a modem. In fact, you can do so in one of several ways: by sending e-mail from Exchange (confusing and slow); by printing to the fax printer from an application (better, but forces you to change the default printer and then change it back later); or (my favorite) by using the Compose New Fax Wizard.

You'll find this option under *Programs • Accessories • Fax*. If you plan on using it with any frequency, move the shortcut closer to the top level of the Start menu. This Wizard lets you customize your faxing procedures and cover pages, but it's simple enough to use instantly. Fax away!

By Richard Freedman

Richard Freedman, a former group manager on the Windows 95 team at Microsoft, is a vice president at Garden Homes Management, a real estate investment firm in Stamford, Connecticut.



YOU INSTALL WINDOWS 95'S FAX FEATURE along with the Exchange mail client. The Microsoft Fax Properties box makes it relatively simple to set up faxing for yourself, and even for others on your network.

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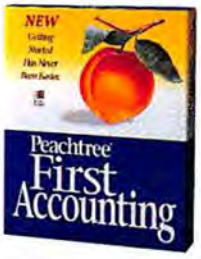

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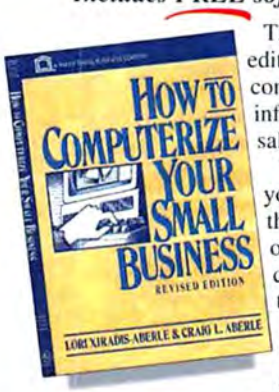

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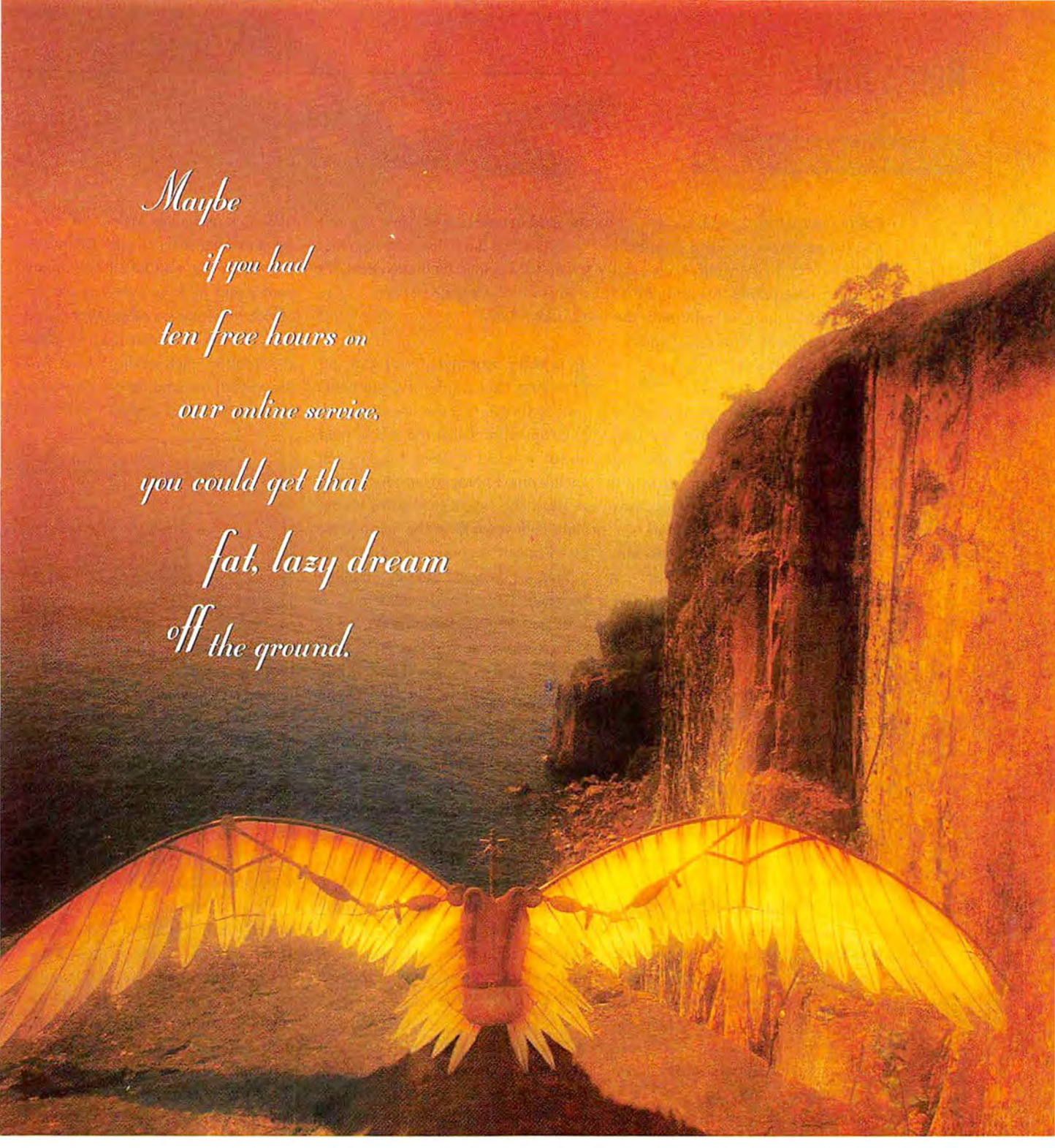

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DATA MANAGEMENT Q&A

Open a Form Automatically in Access

Q I'd like a specific form to appear whenever I open my Access 2.0 database. If possible, I'd also like to automatically hide or minimize the Database window. How do I do this?
Sue McKinley, Boston

A You can create an autoexecuting macro that opens forms and performs other specified tasks when you open an Access 2.0 database. To create the macro, first open the database, then choose *File•New•Macro* from the menus, or go to the Database window, click the *Macro* tab, and click *New*.

In the Macro window, enter a line for each action you want Access to perform when you open your database. To minimize the Database window upon opening the file, type **Minimize** in the first line of the Action column, or select it from the drop-down list. On the next line, type **OpenForm** or select it from the drop-down list. In the Action Arguments section of the dialog box, enter the name of the form you want to open on the 'Form Name' line, or select it from the drop-down list.

If you want to specify where the form should appear on the desktop and how big it should be, add a MoveSize action to the macro. Just type **MoveSize** or select it from the drop-down list, and specify its size in the bottom of the dialog box. When you're finished, close the Macro window, choose *Yes* in the next dialog box, and type in the macro name **autoexec**. The next time you open your database, Access will minimize the Database window and open the form named in the Autoexec macro.

Adding to a Paradox Memo Field

Q I use a Paradox 5.0 for Windows form with a memo field that I frequently add text to. When I move the cursor to this field and start typing, however, Paradox erases the existing text in the field. I have to double-click the field to enter memo view before I can add text. Can I change this so that whenever I land in the memo field, it's ready to accept additional text?
Ed Riley, Seattle

A To make your memo field ready for editing, add a line of ObjectPAL code to your form. First, open the form in design view. Click the memo field object to select it (black handles will appear on its borders), and right-click to show the field's Properties menu. Choose *Methods* from the menu, double-click *arrive*, and in the ObjectPAL editing window, add the following line between 'method' and 'endmethod':

```
self.postAction(EditEnterMemoView)
```

Then close the window. Next time you run your form, you'll land in the memo field ready to edit. To exit the memo field, click on the next field you want to edit, or press **<F2>** to leave memo view, then press any cursor key.

Removing Boxes in Approach Reports

Q I'm using Approach 3.0 to create quick reports using the Standard option offered by the Report Assistant. The layout of the data is fine, but I hate the boxes surrounding each piece of information. How can I get rid of them or create reports without them?
Sam Rodriguez, Fresno, California

A You can alter the way the Report Assistant shows data by changing the setting in the *SmartMaster Style* drop-down list in the Report Assistant dialog box. Click on *B&W3* to get a report without boxes around data.

Though you're limited to the SmartMaster's styles when first creating a report, once you've set one up, you can change the default style and apply it to selected objects. Choose *Tools•Preferences* and click *Edit Default Style* in the Preferences dialog box. In the Define Style dialog box, you can change all kinds of options—from fonts to labels to background colors. When you've finished making changes, click *OK* twice.

To apply the new default style, open your report in design view, select the objects you want to change, then click the *InfoBox* SmartIcon. In the InfoBox, click on the *Named Style* drop-down box and choose *Default* to change all selected objects.

You could also create a separate named style instead of editing the default style every time you want to change the way a report looks. Choose *Tools•Named Styles* from the menu, then click *New* to create a style from scratch, or *Copy* to base the new style on an existing one. You can apply the named style to selected report objects as described above.

Correction: In "Importing dBASE Info Into Paradox 5.0" in September, I suggested using a query to get a Paradox table from a dBASE file. Glen Hinkson of St. Andrew, Barbados, and others pointed out that there's an easier way: Select *Tools•Utilities•Copy*, enter the dBASE file name as the file you're copying from, and add **.db** to the name of the file you're copying to.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World *and the author of* The Paradox 5.0 for Windows Handbook *(Random House Electronic Publishing, 1994, 800/793-2665).* Data Management *welcomes your questions and pays $50 for published items.* *See page 12 for contact information.*

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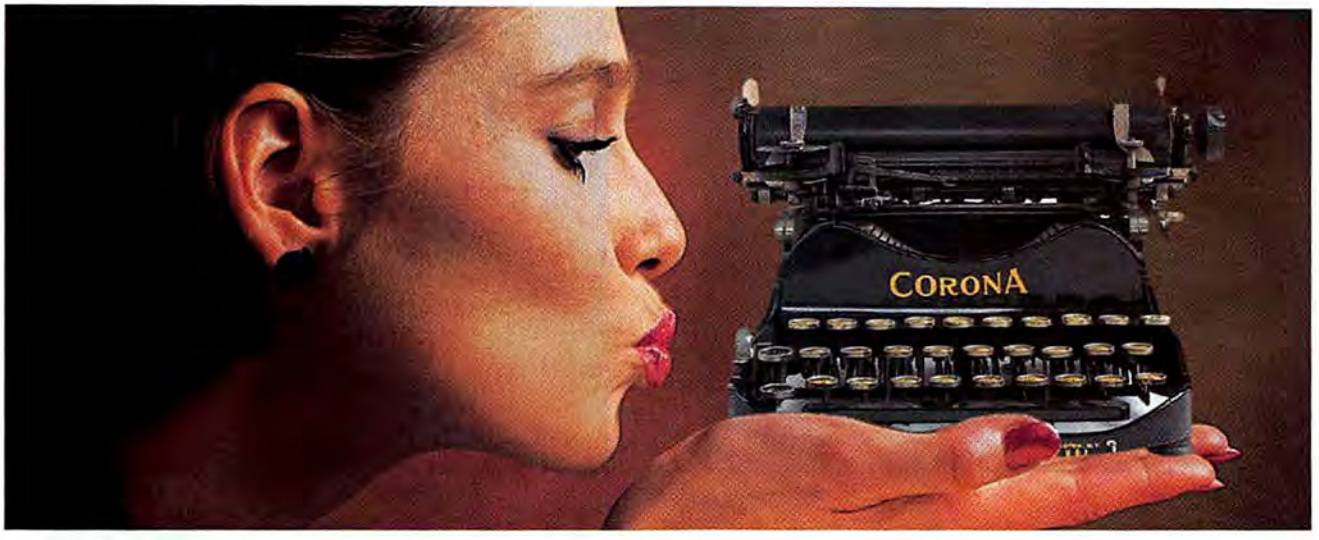

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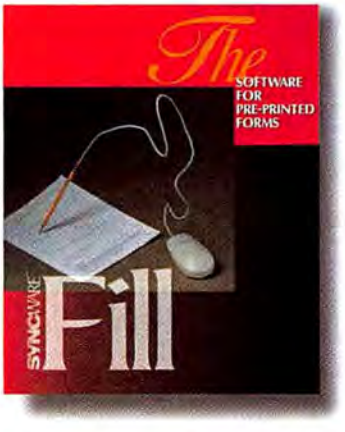

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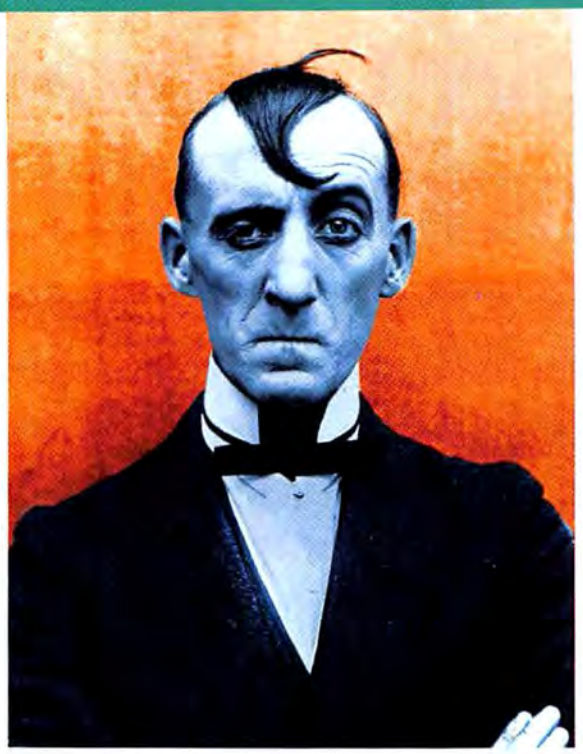

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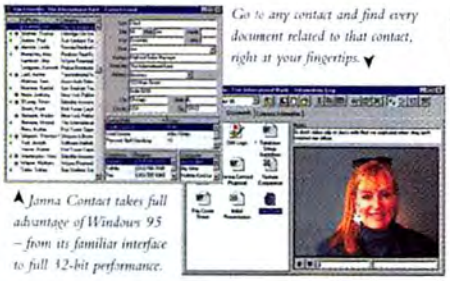

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PRESENTATIONS Q&A

View Presentations on the Quick

Q I've heard that you can view certain files in Windows 95 without opening their applications. Does this feature work with Lotus Freelance Graphics presentation files? If so, how do you do it?
Tyler Fach, Lafayette, California

A Yes, it does, and it's as easy as pie. Thanks to Windows 95's Quick View feature, you can look at Freelance Graphics .pre and Microsoft PowerPoint .ppt presentation files without opening either program (or even having them installed on your system). You can also use Quick View to preview other graphics files, such as CorelDraw .cdr and Windows bit-map .bmp.

This is a nice productivity boost—for example, you no longer have to launch the program just to differentiate one presentation file from another. Quick View is also handy for viewing graphics files attached to e-mail messages and browsing other files on your system.

Quick View is a Windows 95 accessory. If you haven't installed it, here's the drill:

1. Open the Control Panel and then click *Add/Remove Programs*.
2. Select the *Windows Setup* tab.
3. Double-click *Accessories* in the Components box, select *Quick View*, and click *OK*.
4. Insert the Windows 95 installation disk or CD-ROM into the drive selected, and then click *OK* to copy the program to your hard disk.

Here's how to use Quick View to look at a Freelance file:

1. Using Windows 95's Explorer or another method, open a folder and locate the Freelance .pre file you want to preview. Select the file and right-click it to see its File menu.
2. Click *Quick View* to open the file in a window, as shown in the figure below. (Note: If the Quick View command isn't available, it means that the program isn't installed.) Press **<Ctrl>-<Page Up>** and **<Ctrl>-<Page Down>** to view different pages in the presentation.
3. If you have Freelance installed (either the Windows 95 or Windows 3.*x* version), you can select *File•Open File for Editing* from within Quick View to launch the file and proceed to work on the presentation. Or you can preview another file by dragging its icon into the Quick View window.

That's all there is to it. Before long, you'll probably wonder how you ever managed without Quick View.

USE WINDOWS 95'S QUICK VIEW to preview Freelance Graphics and other presentations in a snap—without opening the program itself.

Changing All of Your PowerPoint 4.0 Bullets

Q I wanted to globally change all of the bullets in a PowerPoint 4.0 presentation from squares to check marks, so I modified the default bullets in the Slide Master for the Bulleted List layout. But some of the bullets on a few slides are still squares. Why?
LeAnne Runstrom, San Mateo, California

A When individual slides refuse to conform to changes you make to the default text on a PowerPoint Slide Master, it means that those errant slides were formatted directly on the slide itself in Slide View. Direct formatting overrides the Slide Master defaults, so these slides will not be affected by changes you make to the Slide Master.

Here's the easiest fix:

1. In Slide View, go to a slide that has the formatting you want for all bulleted lists. Click the *Selection* tool, then click the bulleted list to select it (you'll see a selection box around the text).
2. Choose *Edit•Select All* to select all of the text in the list (although the bullets themselves will not be selected), and then select *Format•Pick Up Text Style*.
3. Next, go to a slide with bullets you want to fix. Use the *Selection* tool to select the bulleted list, choose *Edit•Select All* (again, to select all the text in the list), and then select *Format•Apply Text Style*. The bulleted list will immediately change to the proper formatting.

To finish, go to each additional slide with bullets that need fixing, and repeat step 2. Any changes you now make to the Slide Master for the Bulleted List layout will appear on each chart linked to that layout.

By Richard Jantz

Richard Jantz is a contributing editor for PC World *and a publishing and presentations consultant in Kensington, California.* Presentations *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

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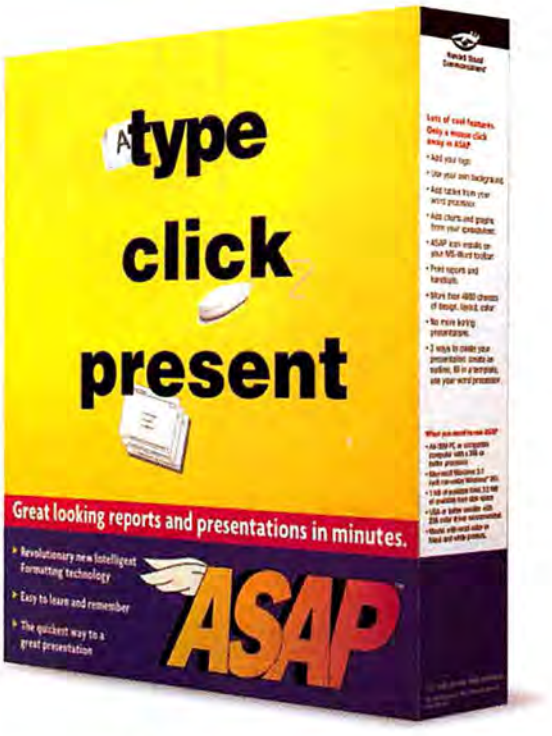

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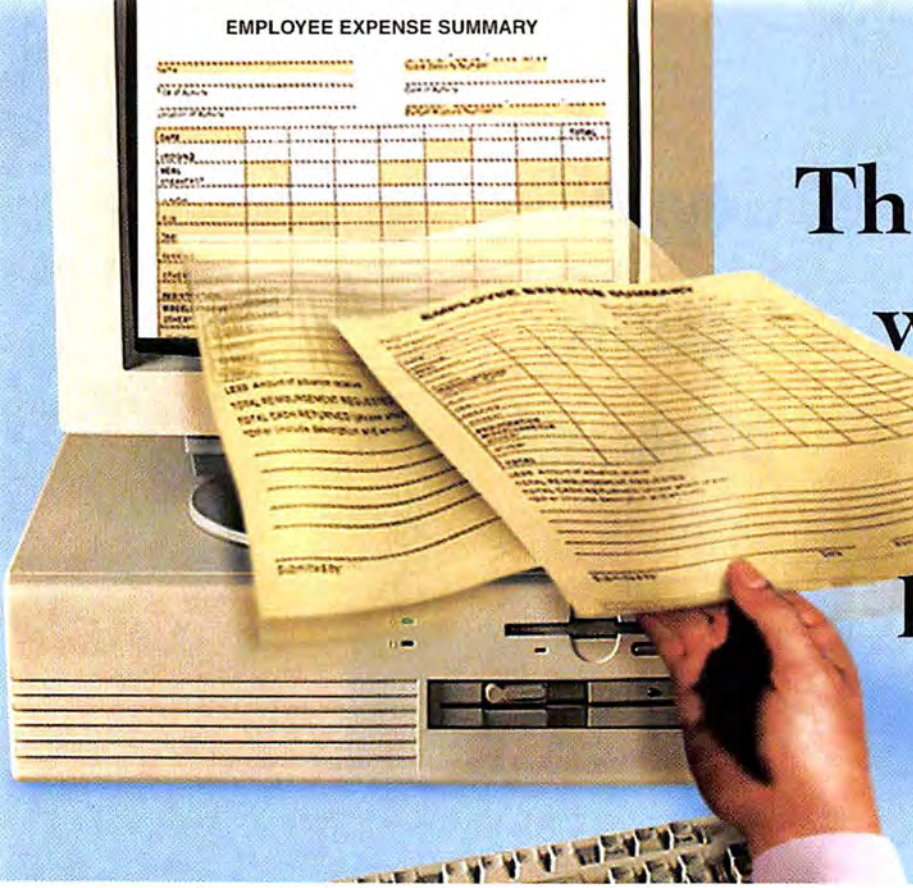

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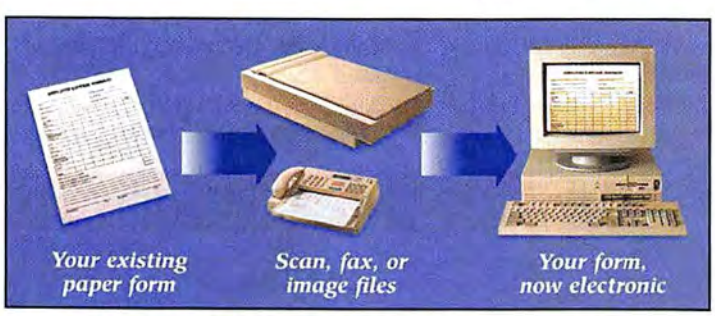

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ONLINE Q&A

Reading Usenet Newsgroups via Office E-Mail

Q My office e-mail system taps into the Internet, so I can send and receive Net mail. Can I read Usenet newsgroups through e-mail as well?
Antoine Wall, Dubuque, Iowa

A The Electronic Library Project at Stanford University lets computer users like you receive a daily dose of Usenet messages on topics of interest via private e-mail boxes. You can't post messages to the newsgroups, though.

Start by sending an e-mail message to **netnews@hotpage.stanford.edu**, with nothing but the word *help* in the message. The Stanford computer will send you directions on how to sign up.

To subscribe, send another message with keywords that you want the computer to search for. For example, the following keywords tell the computer to send you all Usenet messages that include the words *pizza* and *commodities*, and to send them every two days:

```
subscribe pizza commodities
period 2
end
```

This system is flawed, however. Say you'd like to read a newsgroup devoted to investments in pizza commodities. The service won't send you all the messages posted in the newsgroup, only those containing the words *pizza* and *commodities*. So it's still better to tap into Usenet groups through a commercial online service or an Internet provider.

Can Blind People Ride the Info Highway?

Q Is there any way a blind person can access Prodigy or America Online? My screen reader software won't work with the interfaces for those services. And is there any way I can navigate the World Wide Web?
Luther Thomas, El Cerrito, California

A You can tap into AOL by using its Windows version with a utility that gives any Windows application the ability to "talk." Two such products are the $595 OutSpoken for Windows 3.1 and the $495 WinVision. These utilities work with any speech synthesizer.

OutSpoken and WinVision work with CompuServe for Windows too, but not very well with the Windows version of Prodigy. Third-party products that give Prodigy the ability to talk have come on the market intermittently, but their effectiveness has been short-lived because Prodigy changes its software so frequently. (At press time, Prodigy was in the midst of yet another overhaul.)

The Internet is easy for blind people to navigate because there are so many text-based programs for Net surfing that work well with voice synthesizers and reading devices. Browsers like Netscape's Navigator and Mosaic also work with OutSpoken and WinVision, but they give you access to only the text part of Web pages, not to the information stored in graphical images.

That's not keeping many blind people from getting online. Kelly Ford, an information specialist in Madison, Wisconsin, who runs her own Web page for the blind, says, "I am a huge fan of the Internet and online services. They've opened up many doors for me. I only hope those doors remain open." You can access Ford's home page at **http://www.turnpike.net/metro/kford/index.html**. There's also an Internet mailing list for blind people. Subscribe by sending a message to **listserv@sjuvm.stjohns.edu** with the text **subscribe blindfam** *your name*.

All the major online services have forums for blind people. The best are on CompuServe and GEnie. There's also a FidoNet BBS echo called BlinkTalk. If you have access to a FidoNet BBS, ask the sysop to carry the BlinkTalk echo.

- **OutSpoken for Windows** $595; Berkeley Systems Inc.; 800/344-5541 ext. 100; 510/540-5535
  Reader service no. 631
- **WinVision** $495; Arctic Technologies International Inc.; 810/588-7370
  Reader service no. 632

Judy Heim is a PC World *contributing editor and author of* The Needlecrafter's Computer Companion *and* I Lost My Baby, My Pickup and My Guitar on the Information Highway *(No Starch Press, 1995, 800/420-7240).* Online *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

Quick Definitions

Voice-Modem: A growing class of modems that can transmit both data and voice over the same phone line. Some high-end models offer voice-mail capability.

VoiceView: One way of switching between voice and data. Developed by Radish Communications Systems and supported by Win 95, VoiceView is found in an increasing number of low-cost voice-modems. Users alternate between sending voice and data—as opposed to transmitting both simultaneously, as more expensive modem technology permits. Modems on both ends must support VoiceView and run communications software that supports it. (Few packages currently do, and some observers expect VoiceView to be replaced by DSVD.)

Digital Simultaneous Voice and Data: Another way of transmitting voice and data. Devices equipped with DSVD technology can send voice and data simultaneously. DSVD modems cost several hundred dollars more than VoiceView modems and must support speeds of at least 28.8 kbps. There's no standard for DSVD transmission yet—Hayes, U.S. Robotics, and Rockwell are trying to win International Telecommunications Union approval of their specifications, but so are other manufacturers. Meanwhile, it's "buyer beware."

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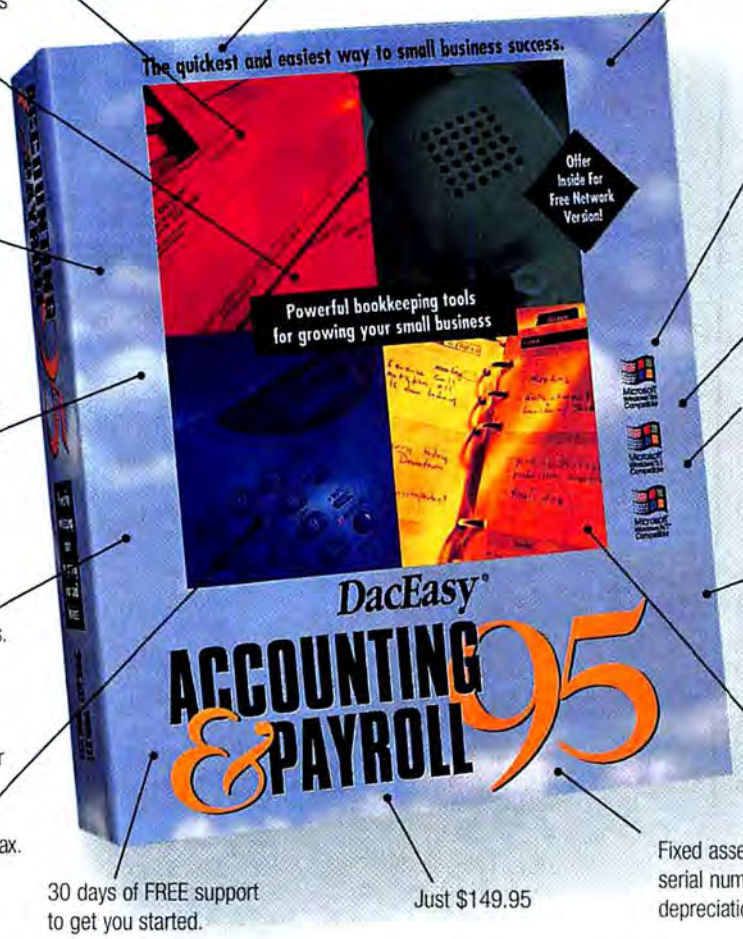

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HARDWARE Q&A

Legacy Hardware Meets Windows 95

Q I installed Windows 95 a while ago, but the graphics card I bought recently is not Plug and Play–compatible and did not come with a Windows 95 driver. Should I just go ahead and install the old Windows 3.1 driver? Is there anything special I should know when installing a non–Plug and Play card for Windows 95?

Joy Krieger, Bloomington, Indiana

A Devices that aren't compatible with Plug and Play usually work fine with Windows 95, but you shouldn't use the Windows 3.*x* driver if you can avoid it. Windows 95 comes with a huge number of drivers for *legacy*, or non–Plug and Play, hardware. Even if Windows 95 doesn't have a driver for your specific graphics card, it's very likely to have one for the card's controller chip. Using this 32-bit, protected-mode driver should work better than using the 16-bit 3.*x* driver: If you install the 16-bit driver that came with your card, Windows 95 will switch into real mode, slowing performance.

Here's how to install your graphics card (or any legacy device) under Windows 95. First, double-click *My Computer* and open the Control Panel; then double-click *Add New Hardware*. Click the *Next* button, and answer *No* when the Add New Hardware Wizard asks if you want Windows 95 to search for new hardware.

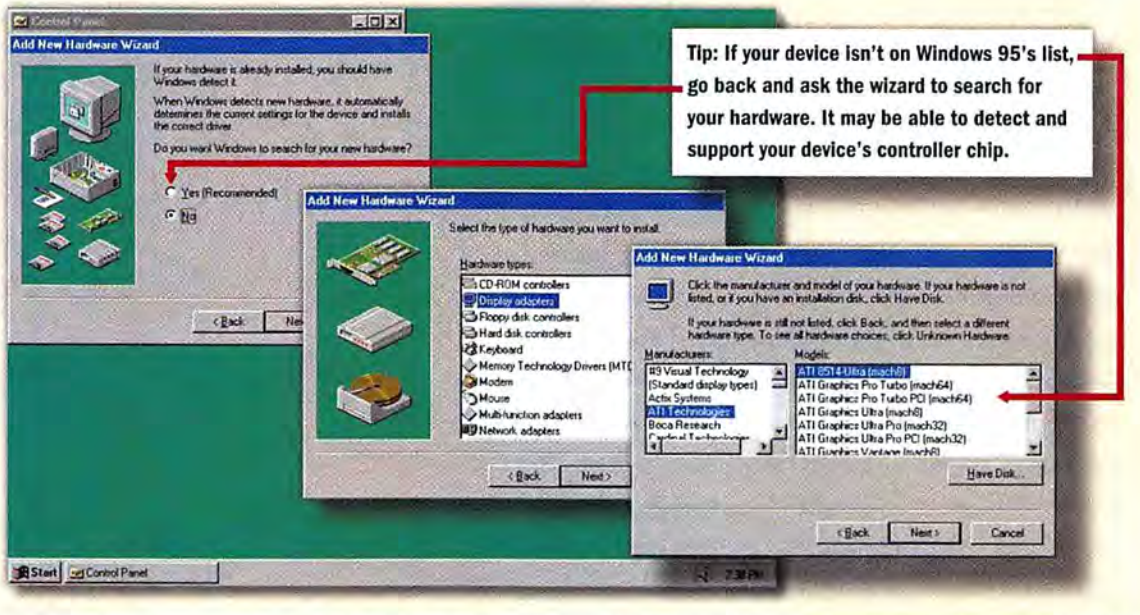
Now click *Next* again, and you'll see a list of hardware types. Select *Display Adapters* (the second item on the list) to bring up a listing of specific makes and models. If you find your device, double-click it. Then click *Next* twice, and Windows 95 will be ready for you to shut down your computer and install the graphics card.

If you can't find your device on the list, install the device first and then click on *Yes* rather than *No* when the Add New Hardware Wizard asks if you want it to search for new hardware. Even if Windows 95 doesn't find the exact make and model of your device, it will probably list the correct chip—but it pays to know what chip is on your card so you can verify Windows 95's guesswork. (The chip name should be on the graphics card's box; if not, look for a label on the biggest chip on the card.) If Windows 95 guesses either the right card or the right chip, click *Next* and you're in business—although you may not be able to access special card features such as support for an extrahigh refresh rate.

If Windows 95 guesses wrong—or if it seems to be right, but your new device doesn't work—you should make every effort to get a Windows 95 driver from the card's manufacturer and install it manually.

Once you've got the driver, go to the Add New Hardware Wizard's hardware list. Select a *Standard* (generic) driver, click the *Have Disk* button, and insert the driver disk. Click *Next* a couple of times to finish up.

Can't get a Windows 95 driver? Your final options are to try loading the Windows 3.*x* driver with the Have Disk option, or to run the graphics card's old-



THE ADD NEW HARDWARE WIZARD makes it easy to install non–Plug and Play devices—*if* a Windows 95 driver is available. Initially, don't ask Windows to find your new hardware; instead, select the device you want to install and choose the model from the list.

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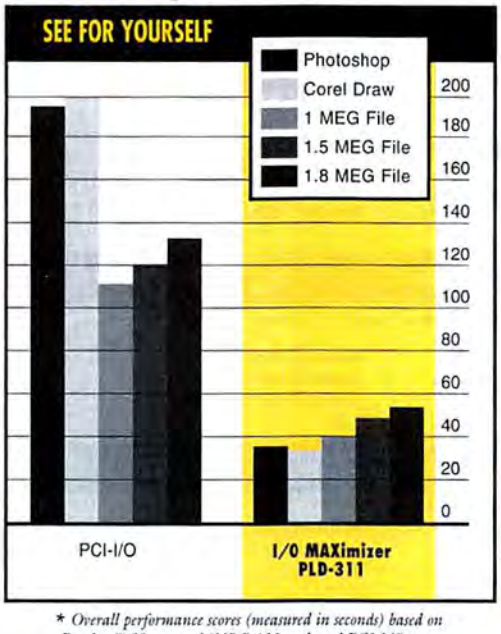

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fashioned install utility from Windows 95's DOS prompt. Be aware, however, that the performance hit from installing the old driver will be significant. And if it's a PCI card, you'll have to install 16-bit drivers for any other devices on the PCI bus (see "Windows 95 Stumbles on PCI" in the October column).

Without a Windows 95 driver, your graphics card upgrade may be a performance downgrade. I recommend avoiding any new card that lacks a Windows 95 driver as well as a controller chip that Windows 95 supports.

Swap Those Floppies

Q I want to install a program that needs to be rebooted from drive A: during setup. The package comes with 3½-inch floppy disks. The problem is that my A: drive is a 5¼-inch floppy drive, and my B: drive is a 3½-inch.

I tried swapping the drives using my system setup utility, but I had no success. Is there any way I can change them?
Vinay Mehta, Lennoxville, Quebec, Canada

A The easiest way to swap drive designations is to open up your PC and switch around the floppy drive connectors.

This will require some acrobatics with the ribbon cables that hook your floppy drives to the motherboard—you'll have to twist them around so the connector hooked to drive A: hooks to drive B:, and vice versa. (Sometimes, too, the drives have different types of connectors, so you may need connector adapters.)

But this beats actually unscrewing the drives and reversing their positions.

Once you've swapped connections, close up your machine, turn it on, go back into your system setup routine, and make sure drive A: is 1.44MB and drive B: is 1.2MB.

There's just one drawback to solving your problem in this fashion: Trying to remember that drive B: is now drive A: may start to drive you nuts.

Installing SIMMs Two by Two

Q Back in the June issue, you said that 72-pin SIMMs could be installed "one at a time" ["Memory Mishmash"]. I was all set to install a brand-new 72-pin SIMM, only to read in my Pentium-90 PC's manual that its SIMMs must be installed in pairs. Which PCs let you do it one at a time?
Peter Yates, Internet

A The question was about 486 PCs, and I should have said categorically that my answer applied only to all 486 and 386 systems—not to Pentiums.

A 72-pin (that is, 36- or 32-bit) SIMM is a full memory bank for a processor such as a 486 with a 32-bit data bus. However, it's only half of a bank for a Pentium, which has a 64-bit data bus. So 72-pin SIMMs must indeed be added in pairs in all Pentium systems.

By Eric Knorr

Eric Knorr is a contributing editor for PC World *and editor and principal author of* The PC Bible, *now in its second edition (Peachpit Press, 1995, 800/283-9444).* Hardware *welcomes your questions and pays $50 for published items. See page 12 for contact information.* ■

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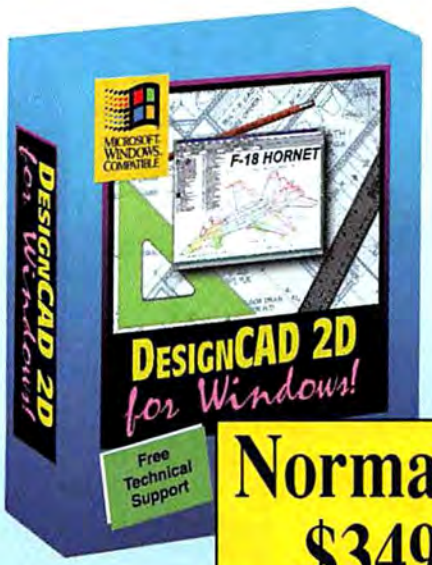

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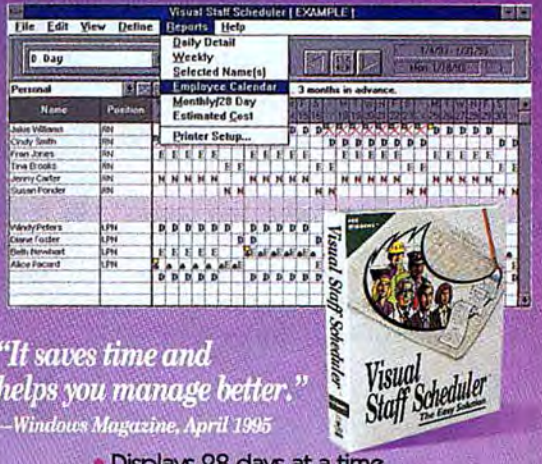

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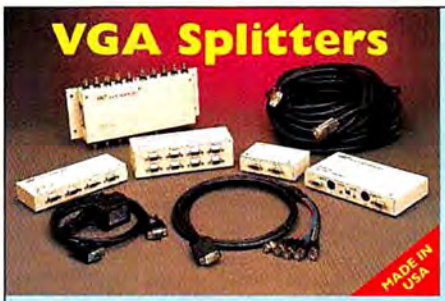

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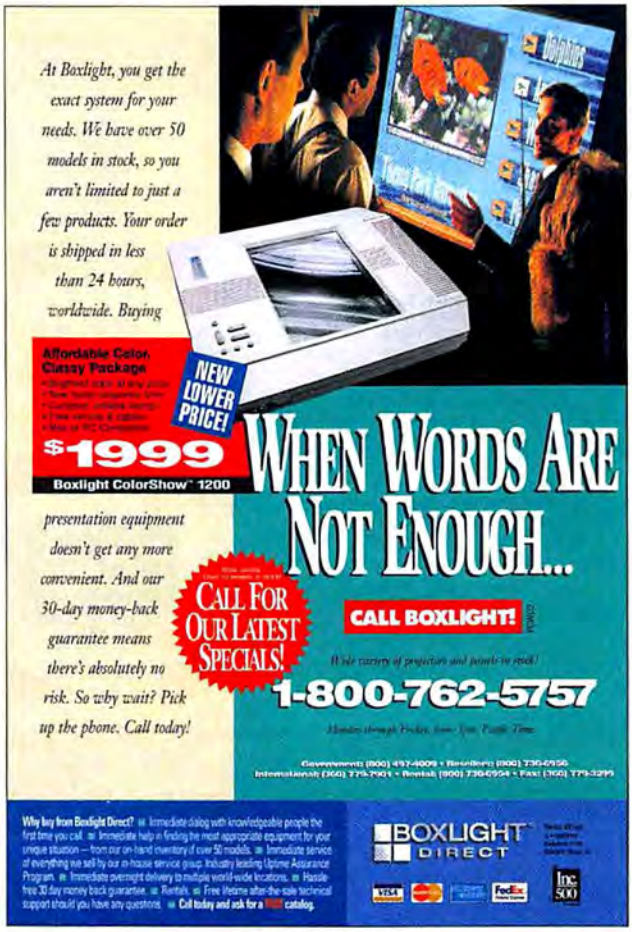

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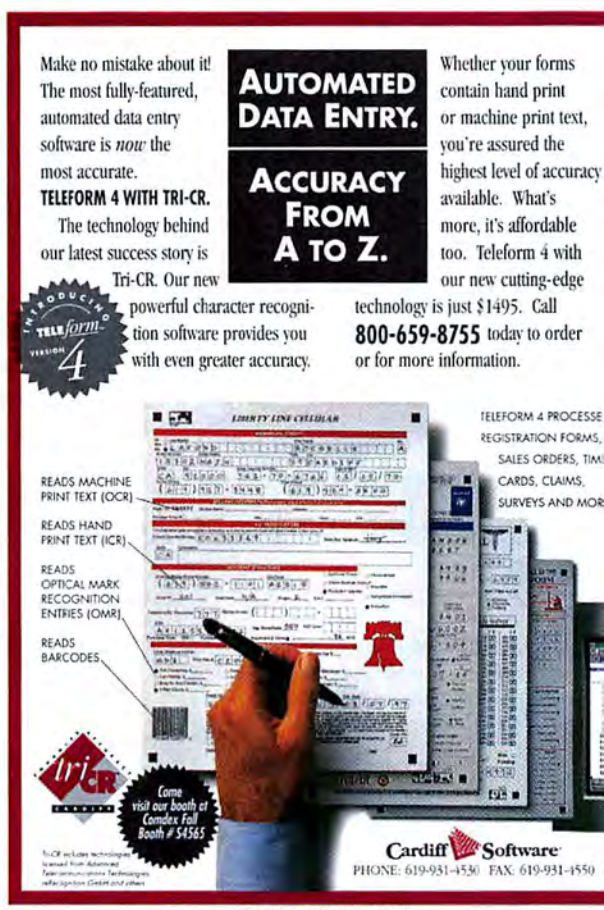

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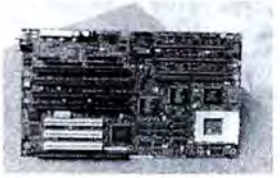

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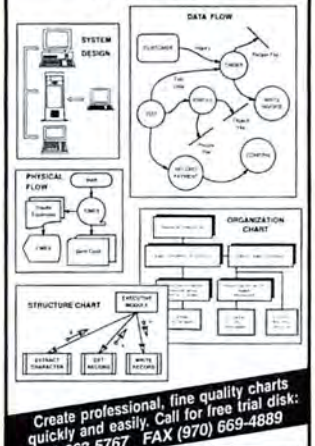

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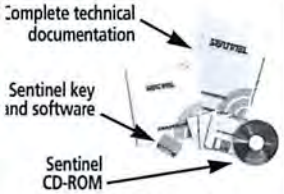

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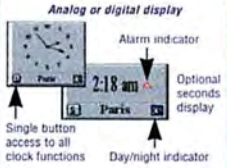

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Satellite Pro 400

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Processor	Screen	HD	Price
Pentium 90	11.3" Dual Scan	772MB	CALL
Pentium 90	11.3" Active	772MB	CALL

Satellite 2110/2130

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	330MB	$1979
486DX4/75	10.4" Dual Scan	500MB	2459
486DX4/75	10.4" Active	500MB	3059

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486DX2/50	10.4" Active	360MB	$2199
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486DX4/75	10.4" Dual Scan	360MB	2649
486DX4/75	10.4" Dual Scan	540MB	2949
486DX4/75	10.4" Active	360MB	3219
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Chassis	Processor	HD	Price
Minitower	Pentium 75	1GB	$1899
Minitower	Pentium 100	1.6GB	2399
Minitower	Pentium 100	1.6GB	2599*
Minitower	Pentium 120	1.6GB	2599
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Processor	Screen	HD	Price
Pentium 90	10.4" Active	720MB	$5349
Pentium 90	12.1" Active	720MB	6049
Pentium 120	12.1" Active	720MB	6599
Pentium 90	12.1" Active	1.2GB	7449*

*Features built-in CD-ROM drive

WIN 95 models available. Call for details.

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Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	340MB	CALL†
486DX4/75	10.4" Dual Scan	540MB	CALL†
486DX4/75	10.4" Active	540MB	CALL
486DX4/75	10.4" Dual Scan	540MB	CALL*
486DX4/75	10.4" Active	540MB	CALL*

*Features built-in CD-ROM drive

† Built-in audio, speaker, MIDI/joystick port not standard WIN 95 models available. Call for details.

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Chassis	Processor	HD	Price
Desktop (614)	Pentium 100	850MB	$1889
Minitower (812)	Pentium 100	1.2GB	2089
Minitower (814)	Pentium 100	1.2GB	2379*
Minitower (818)	Pentium 133	1.6GB	2989*

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Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	500MB	$2639
Pentium 75	10.4" Dual Scan	800MB	2879
Pentium 75	10.4" Dual Scan	1.2GB	3249
Pentium 75	10.4" Active	800MB	3799
Pentium 75	10.4" Active	1.2GB	4199
Pentium 90	10.4" Dual Scan	800MB	3259
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Chassis	Processor	HD	Price
Minitower (910)	Pentium 75	850MB	$1749
Minitower (915)	Pentium 100	850MB	1999
Minitower (920)	Pentium 75	1.2GB	2199
Minitower (930)	Pentium 100	1.2GB	2499
Minitower (940)	Pentium 133	1.2GB	2999

Monitors priced separately

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Processor	Screen	HD	Price
486DX2/50	9.5" Dual Scan	340MB	$254
486DX2/50	9.5" Active	340MB	307
486DX4/75	9.5" Dual Scan	528MB	307
486DX4/75	9.5" Active	340MB	331

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Chassis	Processor	HD	Price
Minitower	Pentium 75	1GB	$1699
Minitower	Pentium 100	1GB	1979
Minitower	Pentium 133	1.2GB	2359+

+28.8 fax/modem *Monitors priced separately*

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- Built-in infrared for wireless communications

Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	524MB	$2449*
Pentium 75	10.4" Dual Scan	524MB	2939
Pentium 75	10.4" Active	524MB	3519

*CD-ROM Drive is an optional accessory on this model

Extensa 450

- 10.4" Dual Scan & 9.5" Active display
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- Advanced battery pro
- Built-in infrared for no-hassle printer connections

Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	340MB	$176
486DX4/75	9.5" Active	340MB	234

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Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	500MB	$34
Pentium 75	10.4" Active	772MB	39
Pentium 90	10.4" Active	1.2GB	47

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Processor	Screen	HD	Price
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Pentium 90	10.4" Active	1.2GB	6239*

*16MB RAM standard

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Processor	Screen	HD	Price
Pentium 75	10.4" Dual Scan	510MB	$3799
Pentium 75	11.3" Dual Scan	810MB	4439
Pentium 75	10.4" Active	810MB	4729
Pentium 90	10.4" Active	810MB	5289
Pentium 90	10.4" Active	810MB	5549*
Pentium 120	10.4" Active	1.35GB	6329

*Features Built-In CD-ROM drive

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Processor	Screen	HD	Price
486DX4/75	10.4" Dual Scan	420MB	$2459
486DX4/75	10.4" Active	420MB	3029
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486DX4/100	10.4" Active	720MB	3499

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Processor	Screen	HD	Price
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Pentium 75	10.1" Active	540MB	3999
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Pentium 90	10.4" High Res.	810MB	4799

** Features built-in CD-ROM drive standard*

Versa 2000

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486DX4/75	9.5" Active	350MB	$2299*
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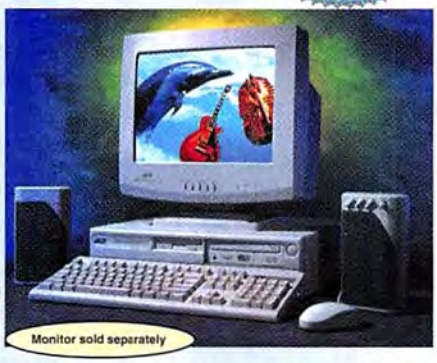

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25 User 3.5"	2065.70
50 User 3.5"	2789.61
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3C503 Etherlink II coax	159.44
3C509B Etherlink III coax	112.08
3C509B Etherlink III coax 5pk	472.70
3C509B Etherlink III 10BT	109.58
3C509B Etherlink III 10BT 5pk	448.41
3C509B Etherlink III combo	124.48
3C509B Etherlink III combo 5pk	516.05
3C579 Etherlink III EISA coax	229.97
3C579 Etherlink III EISA 10BT	232.45
3C1627 12 port Linkbuilder 10BT	621.06

Artisoft

NodeRunner/SI 2000A	87.13
NodeRunner/SI 2000T	73.62
Central Station II	389.13
T-Runner 8 port 10BT	179.99
T-Runner 12 port 10BT	199.82
Simply LANtastic starter kit	163.79
LANtastic V6.0	79.50
LANtastic V6.0 5 user	329.87
LANtastic V6.0 Starter Kit, coax	229.13
LANtastic V6.0 add-on kit, coax	117.86
LANtastic V6.0 add-on kit, 10BT	117.86

ASP

Multiprotocol print server 10BT HP MIO	249.93
Multiprotocol print server 10BT pocket	288.21
Intelligent AutoSwitch, 2 comp to 1 printer	28.50
Intelligent AutoSwitch, 4 comp to 1 printer	39.55
SNAP starter kit-2 computers, 1 printer	119.10
SNAP add-on transmitter	49.50

BAY NETWORKS

SynOptics System 800 10BT 8-port hub	209.24
SynOptics System 800M 10BT 8-port hub	539.70

IBM

Token Ring Adapter II 16/4 ISA	348.99
Token Ring Auto Adapter 16/4 ISA	238.57
IBM Token Ring MAU	398.42

intel

EtherExpress PRO/100Mbps PCI	219.19
EtherExpress PRO/100Mbps PCI 5pk	977.14
EtherExpress PRO/100Mbps EISA	246.52
EtherExpress PRO/10 Fish 10BT	108.01
EtherExpress PRO/10 Fish 10BT 5pk	419.98
EtherExpress PRO/10 Fish 10BT 20pk	1494.74
EtherExpress PRO/10 Fish combo	115.07
EtherExpress PRO/10 Fish combo 5pk	472.00
EtherExpress PRO/10 Fish combo 20pk	1729.70
EtherExpress 16 10BT	99.33
EtherExpress 16 10B T 5pk	469.50
EtherExpress 16 10BT 20pk	1698.38
EtherExpress MCA 10BT	166.52
EtherExpress 16 combo	116.77
EtherExpress 16 combo 5pk	549.72
EtherExpress EISA, coax	409.88
EtherExpress Fish combo	129.79
EtherExpress Fish combo 5pk	591.05
TokenExpress PRO ISA LAN adapter	249.84
NetportExpress EL Ethernet	376.90

NETWORKING PRODUCTS

SMC

EtherEZ 10BT	94.47
EtherEZ coax	94.47
EtherEZ combo	107.06
Etherpower 10BT PCI	139.81
Etherpower coax PCI	149.97
Ultra16 Ethernet coax	91.68
Ultra16 coax 6pk	509.88
Ultra16 10BT 6pk	458.34
Ultra16 10BT 24pk	1429.37
Ultra16 Ethernet combo	107.71
TigerHub TP6 6 port + AUI	167.84
TigerHub TP6B 6 port + BNC	181.99
TigerHub TP12 12 port + AUI	368.99
3608 Ethernet 8 port hub 10BT	298.85
3512 Ethernet 12+2 port hub 10BT	548.55
PC600WS ARCNET coax	119.93
ARCNET 8 port active hub coax	229.41
TokenCard Elite 16/4	221.27

THOMAS-CONRAD

TC6242 ARCNET 8-bit coax	66.86
TC6245 ARCNET coax	179.99
TC5055 Ethernet 8 port hub 10BT	338.28
TCVG045 AnyLAN ISA adapter	214.38
TCVG045 AnyLAN ISA adapter 6pk	1176.48
TCVG047 AnyLAN EISA adapter	297.56
TCVG047 AnyLAN EISA adapter 6pk	1367.94
TCVG050 AnyLAN 100VG 24-port hub	3099.84
TCVG020 AnyLAN SNMP Man. processor	826.31

TERMINALS

Link MC80 14" color	428.73
Link MC5 amber/green/white	273.65
Wyse 55 amber/green/white	223.21
Wyse 60 amber/green/white	279.60
Wyse 160 amber/green/white	329.88

Xircom

PE310BC pocket Ethernet coax	317.26
PE310B2 pocket Ethernet coax	277.51
PE310BT pocket Ethernet 10BT	277.51
PT316CTP pocket Token Ring III	475.83
PPX03 Parallel port multiplexor	77.80

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Jumbo 350 internal	124.26
Jumbo 700 internal	178.88
Jumbo 1400 internal	229.77
Trakker 350 parallel port	229.77
Trakker 700 parallel port	328.78
T1000 800MB Travan	159.44
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PowerTape 2.4GB SCSI external	1077.89

CONNER

Tape*Stor 420MB internal	137.14
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iomega

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Zip disks 100MB, 3pk	49.95
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Backpack 800MB Travan parallel	237.74
Backpack 250MB tape backup parallel	259.65

EXABYTE

EXB-1500 680MB tape backup internal	123.97
EXB-8505XL 7GB tape backup internal	1999.87

SyQuest

EZ135 135MB internal IDE interface	198.99
EZ135 135MB external SCSI interface	239.49
EZ135 135MB cartridge	19.97

MULTIMEDIA AND CD

Creative Labs

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Multimedia Home CD 4x kit internal	448.99
Blaster CD 4x kit	194.34
Sound Blaster Value CD 4x kit	298.99
Sound Blaster Performance CD 4x kit	428.99
Phone Blaster 14.4K internal w/software	189.53
Modem Blaster 14.4K	48.75
Modem Blaster 28.8K	154.13
Sound Blaster 16 value edition (IDE)	94.95
Sound Blaster 16 SCSI-2	178.99
Sound Blaster AWE32	269.63
Sound Blaster AWE32 (IDE)	168.99
Wave Blaster II GamePak	144.44

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ADS VGA to TV Elite external	198.83
Advent PP570 speakers 35W	245.97
Advent PP270 speakers 25W	118.70
Advent PP170 speakers 5W	67.35
Advent PP622 spkrs/subwoofer	168.64
Altec Lansing ACS500 surround system	308.19
Diamond Multimedia Kit ULTRA 8X CD	575.03
Diamond Multimedia Kit 4400 4X CD int	299.69
Diamond Multimedia Kit 4000 4X CD int	289.76
Jensen JPS35 speakers 5W	54.88
Jensen JPS45 speakers 10W	89.93
Microsolutions 4X CD parallel	354.88
Microsolutions 4X CD parallel w/sound	488.15
NEC 6Xi	456.14
NEC 6Xe	547.55
Pioneer DRM624X 6 disc 4X changer	391.42
Plextor 4plex quad external	559.85
Plextor 4plex quad internal	427.96
Plextor 6X internal	499.87
Sigma Designs RealMagic Lite	258.59
Sigma Designs RealMagic MPEG	366.08
Sony 4X internal w/IDE interface	207.75
Sony 4X internal w/SCSI-2 interface	298.18
Teac SuperQuad 4X internal	166.74
Toshiba 3601 SCSI 4X internal	309.86
Turtle Beach Monte Carlo	84.71
Turtle Beach Tropez	193.67
Turtle Beach Monterey	316.94

INPUT DEVICES

ALPS

Portable GlidePoint PS/2	53.79
Portable GlidePoint serial	53.79
Desktop Glidepoint	67.19
GlidePoint Windows 95 keyboard	109.59

CalComp

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DB III 12X12 16 button	249.94
DB III 12X12 pressure pen	389.97
Drawing Slate II 12X12 4 button cordless	228.96

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ES-1000C	727.70
ES-1200-ProPC	1127.46

HEWLETT PACKARD

ScanJet 3P	319.57
ScanJet 3P document feeder	209.49
ScanJet 3C W/ISA interface	936.65
ScanJet 3C document feeder	468.50

MICROTEK

Scanmaker IIG grayscale	234.19
Scanmaker II color	396.65
Scanmaker IISP color	477.46
Scanmaker IIHR color	749.98
ScanMaker III color	2409.95
Scanmaker 35T slide scanner	692.56

Summagraphics.

Summasketch III 12 X 12 16 button	243.13
Summasketch III 18 X 12 4 button	468.33

MONITORS

Mag Innovision DX15F	379.88
Mag Innovision DX17F	678.64
Mag Innovision MXP17F	863.61
Mag Innovision MX21F	1689.47
Magnavox CM2089 14" .28	237.56
Magnavox CM2099 14" .28 NI	249.57
Magnavox CM2015 15" 1024	322.79
Magnavox CM4015 15" 1280	375.84
Magnavox CM4017 17" .31	609.25
Magnavox CM4018 17" .28	674.57
Magnavox 20CM64 20"	1087.09
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Diamond SpeedStar 64 ISA 2MB	199.00
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M61 5/120, 8MB, 1.6GB 28.8 modem CD	2599.00
M71 5/133, 8MB, 1.6GB 28.8 modem CD	2999.00

ThinkPad Portables

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701C DX2/50 540MB act color	2399.00
701CS DX4/75 540MB pas color	2949.89
701CS DX4/75 360MB pas color	2669.93
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701C DX4/75 540MB act color	3488.63
755CSE DX4/100 340MB pas color	3499.00
755CSE DX4/100 540MB pas color	3849.00
755CE DX4/100 540MB act color	4649.00
755CE DX4/100 810MB act color	5099.00
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PC750 5/90 16MB, 540MB	2553.00
PC750 5/90 16MB, 540MB CD	3157.00
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Versa V 4/50 4MB, 340MB act clr	1699.00
Versa 2000D 4/75 4MB, 350MB dual clr	1999.00
Versa 2000C 4/75 4MB, 350MB act clr	2299.00
Versa 2000C 4/75 8MB, 350MB act clr	2599.00
Versa 2000C 4/75 8MB, 540MB act clr	2799.00
Versa 4000D 5/75 540MB dual clr CD	3799.00
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Extensa 450T DX4/75 340MB act color	2292.50
Extensa 550 5/75 524MB dual color	2392.53
Extensa 550CD 5/75 524MB dual clr CD	2865.30
Extensa 550CDT 5/75 524MB act clr CD	3442.65
TM4000M DX4/75 455MB dual color	2449.33
TM4000M DX4/75 524MB act color	2788.50
TM4000M DX4/100 524MB 10.4"act clr	2924.36
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TM5000 5/75 810MB act color	4479.87
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ML395	1009.58	OL810	904.98
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LQ2550	965.06	ActionLaser 1400	495.53

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Panasonic

1150	133.57	4400 Laser	454.90
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microLaser 600	865.10
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Acculogic SIDE-3+ w/on-board BIOS	48.90
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Vi 28.8K V.34 internal w/fax & voice	208.70
Vi 28.8K V.34 external w/fax & voice	225.33
Vi DSVD V.34 internal w/fax & voice	278.82

COURIER MODEMS

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V.34 external w/fax	422.32

Hayes

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ACCURA 288 V.34 internal w/fax	163.76
ACCURA 288 V.34 external w/fax	218.88
OPTIMA 144 external w/fax	374.30
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V.34 28.8 external w/fax	205.00

MICROCOM

Deskporte Fast ES V.34 28.8	179.94
Deskporte Fast EP V.34 28.8	239.99

PURE DATA

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SatisFAXtion 400e, external	324.89
SatisFAXtion 200, 9600 bps internal	216.87

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Voice FaxModem VFX 14.4V external	148.30
14.4 V.32bis w/fax internal	76.74
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Back UPS Pro 650 Plug and Play	295.27
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SmartUPS 1000	551.16
SmartUPS 1400	646.78
SmartUPS 2200	1109.78
SmartUPS 3000	1757.74
SurgeArrest Network	33.25
SurgeArrest Pro	29.45
SurgeArrest Network + Phone	49.98
Line-R 600	119.09

Tripp Lite

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BC PERS 420	129.74	BC PRO 850	269.03
BC PRO 550	188.16	BC PRO 1050	327.59
BC PERS 500	173.09	BC PRO 1400	426.10

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These DynaMo drives feature 230MB, 3.5" x 1" high, 30ms, 256K buffer, SCSI-2 interface, will read & write 128MB and 230MB Disks.

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525MB	n/a	14MB/min	Conner C2525S	$479
2GB	4GB	54MB/min	Conner TSM4000	$515
2.3GB	4.6GB	54MB/min	Tandberg TDC3700	$399
4mm DAT Drives				
2GB	n/a	12MB/min	HP C1534A	$699
2GB	n/a	24MB/min	Conner C4320RT	$789
2GB	4GB	48MB/min	Conner C4324RT	$849
2GB	4GB	42MB/min	HP C1536A	$799
4GB	8GB	48MB/min	Conner C4326NP	$929
4GB	8GB	88MB/min	HP 1533A	$1029
8mm DAT Drives				
3.5GB	7GB	32MB/min	Exabyte EXB8205XL	$1259
7GB	14GB	60MB/min	Exabyte EXB8505XL	$1879

CD ROM

SCSI DRIVES

Brand	Spin	Speed	Price
Sanyo	4X	190ms	$169
NEC	4X	220ms	$229
Pioneer	4.4X	140ms	$245
Plextor	4.5X	130ms	$329
Toshiba	4.4X	155ms	$309
NEC	6X	150ms	$349
Plextor	6X	145ms	$469
Toshiba	6.7X	120ms	$369

ATAPI DRIVES (IDE)

Mitsumi	4X	230ms	$159
Toshiba	4X	190ms	$159
Teac	6X	110ms	$259
NEW DRIVE	8X		$359

CHANGERS

CD ROM Changers allow you to have multiple disks online at one time.

Brand	Disks	Spin	Price
Nakamichi	7	2X	$259
Nakamichi	7	4X	$429
Pioneer	6	4.4X	$509
Pioneer	18	4X	$1899

MULTI-DRIVE TOWERS

7 drives in an external enclosure.

Sanyo 4X $1629 NEC 4X $2129

Pioneer 4.4X $2239 NEC 6X $3079

Plextor 6X $4049 Toshiba 6.7X $3229

HARD DRIVES

	Speed	RPM	Buffer	Brand	Model	Wty	Price
IDE							
540MB	9.5ms	5400	256K	Fujitsu	M1603T	3	$169
540MB	12ms	3551	32K	Maxtor	M7540AV	2	$179
545MB	14ms	3811	120K	Seagate	ST3660A	3	$175
639MB	11ms	4500	64K	Western Digital	AC2635	3	$175
850MB	15ms	3600	64K	Conner	CFS850A	2	$195
850MB	12ms	3551	64K	Maxtor	M7850AV	2	$195
850MB	14ms	4500	128K	Quantum	TB850A	3	$195
853MB	10ms	4500	64K	Western Digital	AC2850	3	$195
854MB	11ms	5400	256K	Seagate	ST5850A	3	$195
1050MB	12ms	5400	128K	Quantum	FB1080A	3	$229
1080MB	9.5ms	5400	256K	Fujitsu	M1606T	3	$219
1080MB	11ms	5400	256K	Seagate	ST51080A	3	$240
1083MB	12ms	4500	256K	Seagate	ST31220A	3	$235
1260MB	12ms	4500	256K	Maxtor	M71260A	2	$272
1278MB	14ms	3600	64K	Conner	CFS1275A	2	$255
1280MB	10ms	4500	128K	Western Digital	AC31200	3	$280
1620MB	11ms	4500	256K	NEC	NEC3747	3	$349
1624MB	10ms	5200	128K	Western Digital	AC31600	3	$379
1626MB	12ms	4480	128K	Maxtor	M71626AP	3	$369
SCSI							
540MB	9.5ms	4500	512K	Fujitsu	M1603S	3	$180
850MB	14ms	4500	128K	Quantum	TB850S	3	$239
1050MB	12ms	5400	128K	Quantum	FB1080S	3	$295
1050MB	9ms	5411	512K	Seagate	ST31230N	5	$375
1080MB	9.5ms	5400	512K	Fujitsu	M1606S	3	$289
1080MB	11ms	5400	256K	Conner	CFP1080S	5	$289
1083MB	11ms	4090	256K	NEC	NEC3827	3	$259
1620MB	11ms	4500	256K	NEC	NEC3847	3	$379
2050MB	8.5ms	7200	512K	Micropolis	MC4221	5	$779
2050MB	8.5ms	7200	512K	Micropolis	MC4221AV	5	$835
2147MB	9ms	5400	512K	Conner	CFP2105S	5	$679
2147MB	9ms	7200	512K	Conner	CFP2107S	5	$719
2147MB	9ms	5411	512K	Seagate	ST32430N	5	$735
2147MB	8ms	7200	512K	Seagate	ST32550N	5	$859
2150MB	8ms	7200	512K	Quantum	XP32151	5	$789
2176MB	9.5ms	7200	512K	Fujitsu	M2915S	5	$659
2216MB	8.5ms	5400	512K	Quantum	VP32210	5	$692
4294MB	9ms	5411	512K	Seagate	ST15230N	5	$965
4294MB	9.5ms	7200	512K	Conner	CFP4207S	5	$1059
4294MB	8.9ms	7200	512K	Micropolis	MC3243	5	$1045
4294MB	8.9ms	7200	512K	Micropolis	MC3243AV	5	$1129
4294MB	8ms	7200	1024K	Seagate	ST15150N	5	$1239
4300MB	8.6ms	7200	512K	Quantum	XP34301	5	$979
4350MB	9.5ms	7200	512K	Fujitsu	M2934S	5	$959
9091MB	12ms	5400	512K	Micropolis	MC1991	5	$1999
9091MB	12ms	5400	512K	Micropolis	MC1991AV	5	$2139
9080MB	11ms	5400	1024K	Seagate	ST410800N	5	$2099
WIDE SCSI							
2050MB	8.9ms	7200	512K	Micropolis	MC4221W	5	$899
2050MB	8.9ms	7200	512K	Micropolis	MC4221WAV	5	$959
2147MB	8ms	7200	512K	Seagate	ST32550W	5	$969
2150MB	8ms	7200	512K	Quantum	XP32151W	5	$859
2176MB	8.5ms	7200	512K	Fujitsu	M2915W	5	$699
4294MB	8.9ms	7200	512K	Micropolis	MC3243W	5	$1169
4294MB	8.5ms	7200	512K	Micropolis	MC3243WAV	5	$1269
4294MB	8ms	7200	1024K	Seagate	ST15150W	5	$1339
4350MB	8.5ms	7200	512K	Fujitsu	M2934W	5	$1025
9100MB	12ms	5400	512K	Micropolis	MC1991W	5	$2139
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64x1	-	-	-	-	2.00
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1 x 32 4 mg EDO	-	189.00	-
2 x 32 8 mg EDO	-	369.00	-
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Bravo 486/25, 486/33	2 Meg Kit	500780-005	118.00
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1MEG – 59.00 4MEG – 169.00 8MEG – 349.00 16MEG – 619.00

ZENITH MEMORY MODULES

MODEL	AMT. UPGRADED	MFG. PART #	PRICE
Z386/33, 25, 20, 33E	1Meg	ZA3800ME	59.00
Z386/33, 25, 20, 33E, 486/25E	4Meg	ZA3800MK	169.00

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IBM 4019, 4019E, FONT CARTRIDGE 209 Fonts, Turbo Card 109.00
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TAX & FINANCE FOR IBM 4019, 4019E, 4029 ..... 139.00
TAX & FINANCE CARTRIDGE 84.00
OKI 400, 800 41 fonts, 11 typestyles 169.00

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IBM Compatibles & PS/2

USES SIMMS

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0Meg **$139.00** 2Meg **$238.00** 4Meg **$319.00** 8Meg **$499.00** 16Meg**$859.00**

PS/2 MCA 0-8MEG EXPANSION BD.

0-8Meg Extended and/or Expanded Memory for all IBM P/S2 Models 50, 50Z, 60, 55SX, 65SX, 16 Bit. 4.0 LIM Compat.

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30F5360 (2Meg)	30-286, 25-286, 50 MTHR BD.	194.00
64503/79 (1Meg)	80-041	79.00
64503/79 (2Meg)	80-111, 311-121, 321, 081, 161	84.00
64510/60 (4Meg)	80-A21, A-61, 30-A31, 80-111, 80-311	189.00
64506/84,92/27196 (2Meg)	70-061, 661, 171, 5XZ, 55SX, 65SX, P-70, 55LS, 65LS, X Station 120 & 130, 35SX, 35LS, 40SX	99.00
64506/86 (2Meg)	70-A21, A-61, 8-21, B-61, 35SX, 35LS, 40SX, Val PI, 325T	90.00
78X8953 (178K)	56	35.00
34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX, 55LS, 65LS	169.00
87F9977/92/27199 (4Meg)	55SX, 55LS, 65SX, 40SX, 35SX, 35LS	169.00
1057035 (512K)	P/S1-286	49.00
90F9936 (2Meg)	P/S1 & P/S1/386SX-2121	109.00
92F9684 (4Meg)	P/S1 & P/S1/386SX, Model-2121	189.00
92G7200 (4Meg)	PSI Expert, Consultant, Willow	169.00
92G7231, 73G5131 (4Meg)	Value Point Performance, PC Server 4/66	169.00
92G7539 (4Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	149.00
92G7541 (8Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	289.00
92G7543 (16Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	559.00
92G7545 (32Meg)	Aptiva 310, 330, 350, 510, 530, 710, 730	1049.00
73G3132/92G7203 (8Meg)	Value Point Performance, PC Server 4/66	339.00
60G1622/92G7204 (16Meg)	Value Point Performance, PC Server 4/66	669.00
92G7205 (32Meg)	Value Point Performance, PC Server 4/66	1239.00
64506/02 (2Meg)	56, 57, 57SX, 90, 95, P-75, 575LC	90.00
6450128,92G7200 (4Meg)	Value Point 77 486DX2, 486SX, SVR 85	169.00
	575X, 90, 95, P-75, 575LC, 56, 565LC, P/S1, 386SX, Mod-2123, 2133, 2155, Val PI 77, 486DX2, 486SX, SVR85	
6450129,92G7428 (8Meg)	Value Point 77 486DX2, 486SX, SVR 85 35SX, 40SX	339.00
6450130/92G7202 (8Meg)	56, 57, 57SX, 90, 95, P-75, 575LC Value Point 77 486DX2, 486SX, SVR 85	339.00
6451153,92G7208 (4Meg ecc)	486, 95XP, 95A (install in pairs)	199.00
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IBM NOTEBOOK & LAPTOP MEMORY

07G1415,07G1420 (4Meg)	Thinkpad 750, C, 700, C, 720, C, CL/75X	179.00
07G1416,07G1421 (8Meg)	Thinkpad 750, C, 700, C, 720, C, CL/75X	349.00
66G0095 (16Meg)	Thinkpad 750, C	619.00
66G0094 (4Meg)	Thinkpad 755, 360, 355, 340, 45P	179.00
66G0094 (8Meg)	Thinkpad 755, 360, 355, 340, 45P	329.00
66G0094 (16Meg)	Thinkpad 755, 360, 355, 340, 45P	619.00
81R9098 (4Meg)	Thinkpad 500, 510CS (3.3 volt)	189.00
81R9099 (8Meg)	Thinkpad 500, 510CS (3.3 volt)	349.00
79F2999 (2Meg)	LX40, N33SX, PS Note	149.00
79F1000 (4Meg)	LX40, N33SX, PS Note, Thpd 350, 350c, PS Note 425	189.00
79F1001 (8Meg)	LX40, N33SX, PS Note	349.00
Hard Drive (524Meg, 710 Meg))	Thinkpad 750, 755, 360, 355	829.00/929.00
(4Meg 16Meg)	Thinkpad 755 Dimm Modules	199/749
(4Meg/16 Meg w/Adac	Thinkpad 755	269/829
60G0378 (4Meg)	Thinkpad 350c, PS Note 425	339.00
60G0379 (16Meg)	Thinkpad 350, 350c, PS Note 425	749.00
92F8864 (2Meg)	N45SL	109.00
92G7252 (4Meg)	Thinkpad 701C, CS, Butterfly	339.00
92G7261 (8Meg)	Thinkpad 701C, CS, Butterfly	699.00
92G7263 (16Meg)	Thinkpad 701C, CS, Butterfly	849.00
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8Meg/16Meg	Thinkpad 820	399/729
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4Meg/8Meg/16Meg/32Meg	PC300 Pentium	179/339/629/1259

COMPAQ MEMORY MODULES

MODEL	AMT. UPGRADED	CMPQ PART #	PRICE
DeskPro 386/33, 386/33L, 486/25, 486/33L, 486/50L, Systempro Pro	2Meg Module	116144-001	99.00
	8Meg Module	116561-001	299.00
	32Meg Module	116562-001	1399.00
DeskPro 386/33L, 486/33L	Exp Bd.	116569-001	275.00
DeskPro 386/25, 386/20	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
DeskPro 386S-16MHz	1Meg Exp Bd	113630-001	149.00
	4Meg Exp Bd	113634-001	279.00
	8Meg Exp Bd	113636-001	479.00
DeskPro 386/20E	1Meg Exp Bd	113644-001	149.00
DeskPro 386/20e	4Meg Exp Bd	113646-001	279.00
	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	199.00
	8Meg Module	113634-001	479.00
DeskPro 286N, 386N, 386SX20 all "M" series, sytem L7 series, all "I" series	2Meg Module	116895-001	89.00
	4Meg Module	116890-001	169.00
	8Meg Module	116891-001	339.00
M Series Exp Bd	0-64Meg	129190-001	189.00
DeskPro 386/16	1-2Meg Exp Bd	108099-001	239.00
	4-8Meg Exp Bd	108270-001	437.00
DeskPro 286	512K Kit	113151-001	49.00
DeskPro 5/60, 5/66M, 5/66M ALL OF THESE MACHINES USE THESE MODULES	8Meg Kit	149511-001	376.00
Prolegna 5/60	16Meg Kit	149549-001	676.00
Prolegna 100 5/60	32Meg Kit	149614-001	1420.00
Proliant 2000 4/30, 5/66	64Meg Kit	149513-001	2476.00
Proliant 4000 4/55, 5/66	128Meg Kit	149514-001	5076.00
Prolinea 386/25S, 425S	2Meg	141738-001	99.00
	8Meg	141742-001	298.00
Prolinea 486 4/25S, 4/33, 4/50, 4/66, DS	2Meg	141683-001	95.00
Enhanced Prolinea, Prosario series	4Meg	141684-001	169.00
	8Meg	141685-001	339.00
Prosignia PC Server, 486/33, 486 DX2/66	8Meg	141685-001	339.00
	16Meg	143320-001	629.00
	32Meg	143147-001	1259.00

COMPAQ LAPTOPS & NOTEBOOKS

LTE/386S/20	4Meg Module	121125-002	209.00
LTE/LITE/20, 25, 25C	8Meg Module	129769-002	399.00
LTE/LITE/20, 25, 25C	8Meg Module	129769-003	439.00
LTE/LITE/20, 25, 25C	16Meg Module	129769-004	669.00
LTE LITE 4/25C/33C/25E/L	4Meg Module	142332-001	189.00
LTE LITE 4/25C/33C/25E/L	8Meg Module	142337-003	349.00
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Concerto, LTE Elite	4Meg	144790-001	189.00
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	16Meg	144790-003	619.00
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	4Meg	139497-002	189.00
	8Meg	139499-001	339.00
Contura 400, 410	8Meg 8Meg/16Meg		189/369/619
Contura 420, 425	4Meg 8Meg/16Meg/32Meg		219/379/619/1239
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	8Meg	146521-001	349.00
	16Meg	146521-001	619.00
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T2100, 2105, 2150	4Meg/8Meg		189/379
T2100, 2105, 2150	16Meg/24Meg		729/1134
T4400SX, SXC T6400, T6600	2Meg	PC-PA2004U	119.00
T4400SX, SXC T6400, T6600	8Meg	PC-PA2005U	399.00
T4400SX, SXC T6400, T6600	16Meg	PC-PA2012U	669.00
T4500, C 1460d, T4700, T1900, C, T1910, T1950 (3.3 v)	4Meg	PC-PA2012U	189.00
T4500, C 1460d, T4700, T1900, C, T1910, T1950 (3.3 v)	8Meg	PC-PA2013U	349.00
T4500, C 1460d, T4700, T1900, C, T1910, T1950 (3.3 v)	16Meg	PC-PA2014U	622.00
T4700, 4800, 4850 (Hard Drive)	S24Meg/710Meg		799/1099
T3400CT, T2400, T3600	4Meg/8Meg/16Meg	PC-PA2013U	189/359/619
T3400CT	32Meg		1549.00
E3100SX	2Meg	PC15-PA8309U	169.00
E3100SX	4Meg	PC15-PA8313U	189.00
T5200/T8500	4Meg	PC10-PA8304U	409.00
T5200/T8500	8Meg	PC10-PA8313U	419.00
T600, 610, CT, T400	8Meg/16Meg/32Meg		549/1099/Call

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
ACER 730, 725C, 760, 780	2Meg/4Meg/8Meg		109/199/369
ACER 763, 765, 782, 784, 786, 787	4Meg/8Meg/16Meg		199/379/719
ACER 750	4Meg/8Meg/16Meg		189/359/679
ALR Venture	4Meg	12407989	249.00
Altima Virage	4 Meg/ 16 Meg		199/679
Altima Virage II	4Meg/8Meg/16Meg		199/399/679
AST Advantage Advantage 4066E, 6066D, 8066D	8Meg/16Meg/32Meg/64Meg		189/459/599/1269
AST Ascentia 900N, 800N	4Meg/8Meg/16Meg		189/379/929
AST Ascentia 950	4Meg		419.00
AST Bravo & Explorer	4Meg/8Meg	501255-001, -002	189/379
AST Bravo MS I, P90	8Meg/16Meg/32Meg/64Meg		379/759/1259/2599
AST Notebook Prem Exec 386SX/20/25/25C	4Meg	500814-003	189.00
AST Power Exec 3/25C, 425EL, 425SL	4Meg/16Meg	501166-001, -003	193/529
AST Power Exec 4/33C	4Meg/16Meg	501318-001,002	193/619
AT&T Globalyst 130	4Meg/8Meg		199/379
AT&T Globalyst 200	4Meg/8Meg/16Meg		199/349/679
AT&T Safari NSX25/33	4Meg	PEC 37651	259.00
Austin DX4, DX2, SX2, SX Series	4Meg/16Meg		199/599
Bondwell B310, Plus	1Meg	23050-09100	69.00
Bondwell B310V, SX	1Meg		109/229
Canon Innova Book 150	4Meg/15Meg		199/769
Canon Innova Book 200LS	4Meg/8Meg/16Meg/24Meg		189/275/639/Call
Canon Innova 486	2Meg/4Meg/8Meg		109/209/449
Canon Innova 486-10	4Meg/15Meg		189/679
Canon Notejet 486	4Meg/8Meg/16Meg		199/379
Canon Notevat DX4/75	4Meg/8Meg/16Meg		209/349/679
Compuadd 425TX Notebook	4Meg/16Meg		199/699
DEC NiNote	4Meg/8Meg/16Meg		199/379/669
Dell Latitude M, MC, MCX	4Meg/8Meg/16Meg		189/379/679
Dell Latitude XP, 475, 4100, 4100CX	4Meg/15Meg		199/699
Dell Latitude 486, 425, 433C, 433CX, 466, 466CX	4Meg/16Meg		199/679
DTK, 4110P Notebook	4Meg/8Meg/16Meg		189/369/639
Epson ActionNote 650, 650c	4Meg/8Meg/16Meg		209/399/659
Epson ActionNote 700, 700c, 706cx	4Meg/8Meg/16Meg		209/399/769
Epson ActionNote 880, 866c	4Meg/8Meg/16Meg		Call/209/669/Call
Epson ActionNote 4000 Notebook	4Meg		279
Epson ActionNote 4/25, 4LC/33, 4DLC/2-50	2Meg/4Meg		119/279
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HP Omnibook 530, 600	4Meg/8Meg/16Meg		189/359/549
HP Omnibook 4000	4Meg/8Meg/16Meg		199/379/649
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Leximark SE10	4Meg/8Meg		229/299
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Midwest Micro Elite SE 25, SX33, DX2-50, DX2-66	4Meg/8Meg/16Meg		199/389/629
Midwest Micro Elite Data 5X33, DX2-50, DX4-75, DX4-100	4Meg/8Meg/16Meg		199/389/629
Mitsubishi Micro Elite Sedia Plus DS-75, DS-95	4Meg/8Meg/16Meg		199/389/629
NCR Safari 2P133	4Meg/ 8 Meg		199/299
NEC Ultralite Versa E, V	4 Meg/8Meg/16Meg/20Meg	DP4104	183/359/619/799
NEC Versa Removable Hard Drive	540Meg/710Meg/810Meg		859/949/1033
NEC Versa 4/25	4Meg/8Meg		199/379
NEC Versa 2000C & 2000D	4Meg/8Meg/16Meg		199/379/799
Packard Bell 386SX, 25E	1Meg, 4Meg	286, 386SX	109/179
Packard Bell 4000	2Meg/4Meg		119/369
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Panasonic CF-P2P, CF-580	4Meg/8Meg/16Meg		219/319
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TI TravelMate 2000	1Meg	2566034-0001	79.00
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Tandy 2820, 3620, 3830	2Meg/4Meg/8 Meg		119/199/309
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SX Alpha/SX Beta	2Meg	ZA-180-86/ZA-180-87	119.00
Zenith Z-Note 425NL, LNC, LNP	4/8/16Meg		199/379/919
Zenith Z-Star 4/33	2/8Meg		119/369

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(for Palmtop & Subnotebooks)

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S-RAM Cards 2MEG	229	SCSI Type II	139
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14.400/14.400 Data/Fax Modem	109	Multimedia Combo: Sound/SCSI	499
Reader/Writer Card (15A Slot)	149	Panasonic KXL-D720 port. CDRom player	339
Lan Ethernet (10 Base T)	129	Type III 130 Mg Hard Drive	399
Lan Ethernet (Coax)	129	Type III 170 Mg Hard Drive	499
		Xircom Combo Ethernet + Modem II 28.8 Adapter	549

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Canon LBP 430	-	-	69	-	-	-	167	-	-	-	-	-
Canon LBP 800	-	-	-	99	-	-	176	-	-	349	669	1249
Canon LBP4 -Elite, Apius	-	-	159	219	-	-	-	-	-	-	-	-
Epson 6000, Action Laser	-	-	-	179	-	-	229	-	-	-	-	-
Epson Action Laser 1100, 1500	-	-	59	99	-	-	169	-	-	329	599	-
Epson Action Laser II	-	-	89	-	208	-	327	-	-	-	-	-
HP 4, 4M, 4P, 4MP, 4Si, 4Si MP	-	-	99	-	208	-	327	-	-	Call	Call	Call
Epson 1000, 1500, 5000, 5200	-	-	-	*109*	-	-	*218*	-	-	-	-	-
HP 2, 2D	-	-	-	99	-	-	179	-	-	-	-	-
HP 3, 3D, 3P, 2P, 2P+	-	-	-	99	-	-	169	-	-	-	-	-
HP 4, 4M, 4Si, 4SiMX	-	-	-	89	-	-	169	-	-	349	-	-
HP 4P, 4PLUS, 4MP	-	-	-	-	-	-	145	-	-	289	-	-
HP 4L	-	-	59	-	-	-	-	-	-	-	-	-
HP 35i	-	-	59	-	-	-	169	-	-	299	-	-
HP 4Si	-	-	-	89	-	-	155	-	-	295	-	-
HP 5P	-	-	-	89	-	-	169	-	-	329	539	-
HP Design Jet 600, 650, 200	-	-	-	89	-	-	167	-	-	349	-	-
HP Deskjet 500, 500C, 510, 550,560	-	55	-	-	-	-	-	-	-	-	-	-
HP Deskjet 1200C, 1200CP	-	-	-	89	-	-	167	-	-	349	-	-
HP Laserjet	-	-	-	-	-	-	176	-	-	376	676	-
HP Printjet XL300	69	-	-	-	-	-	249	-	-	428	837	-
IBM Laser 4019, 4019E	-	-	-	-	-	162	-	-	-	-	-	-
IBM Laser 4029, 4037	-	-	-	-	-	-	185	-	-	-	-	-
IBM Laser 4039, 4079	-	-	-	99	-	-	169	-	-	350	-	-
Konica LP-3310	-	119	189	239	-	-	-	-	-	-	-	-
NEC 90, 290	-	-	-	129	-	-	-	-	-	-	-	-
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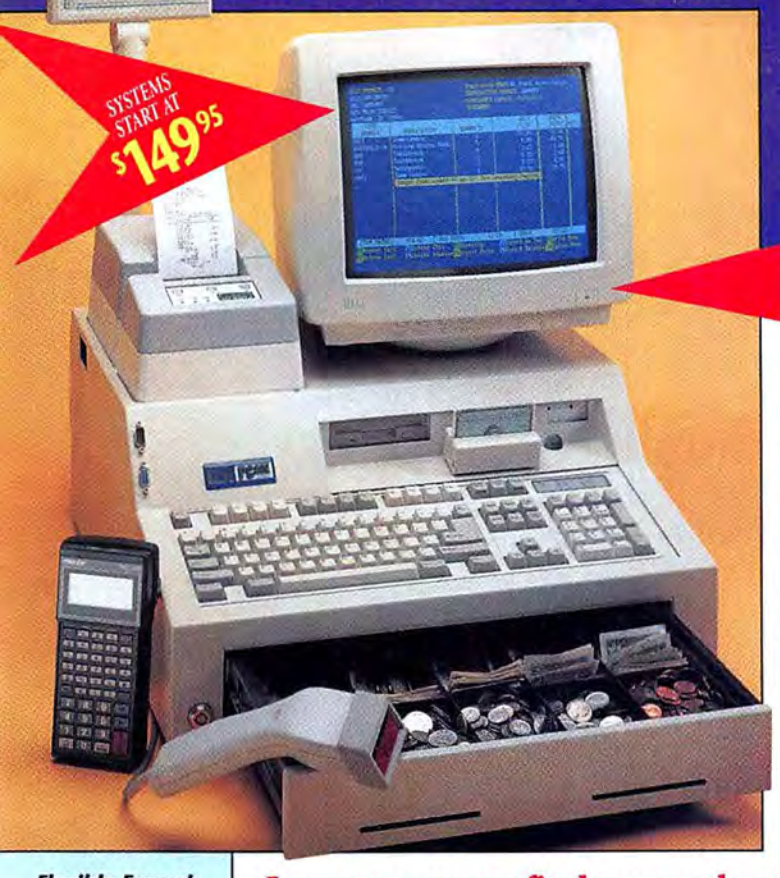

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954 Monitors and video boards
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956 Graphics software
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958 Printers
959 Multimedia products
960 Utilities
961 Mail order companies
962 Storage devices

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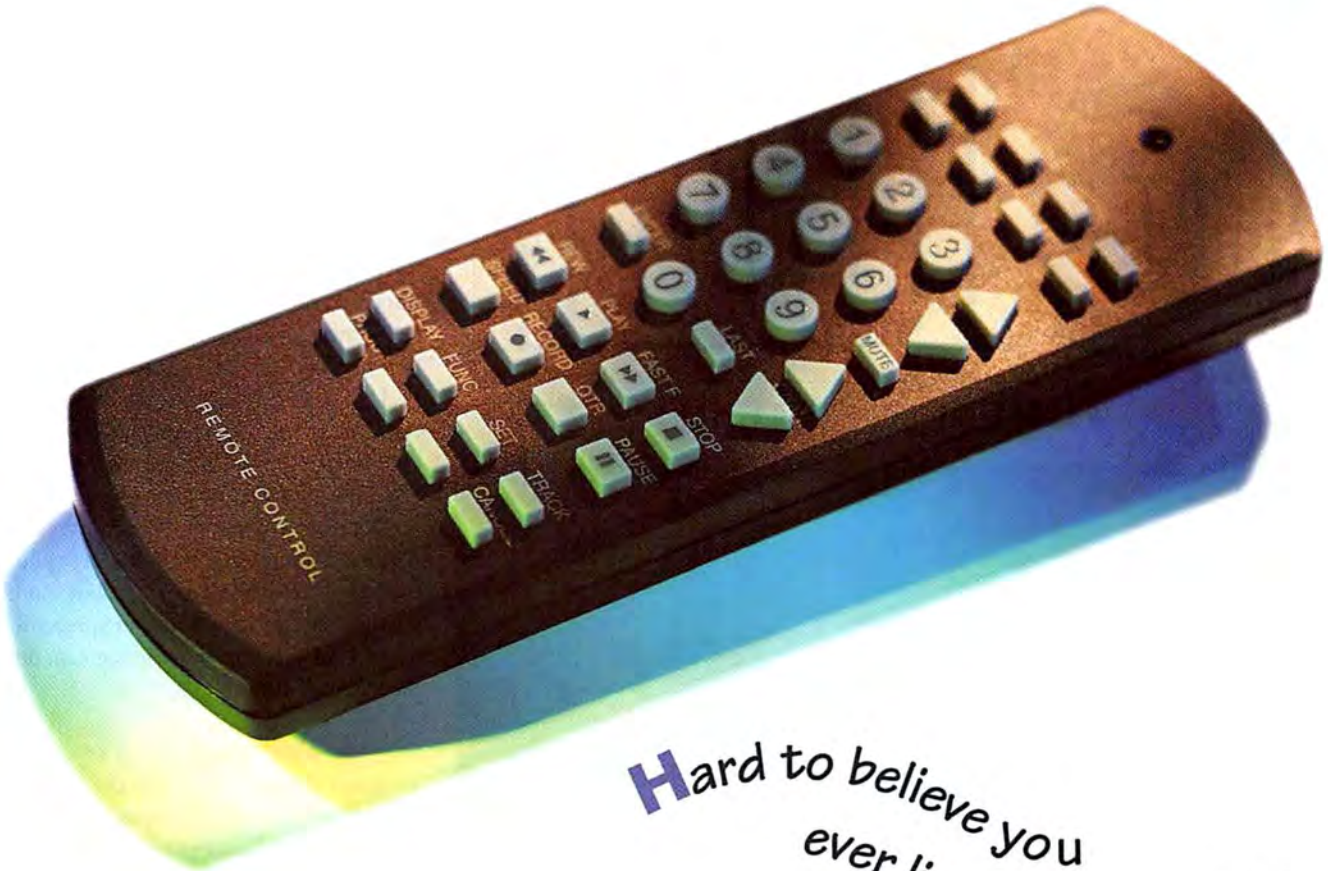

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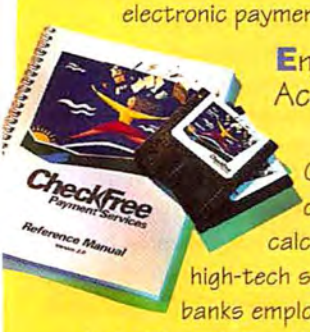

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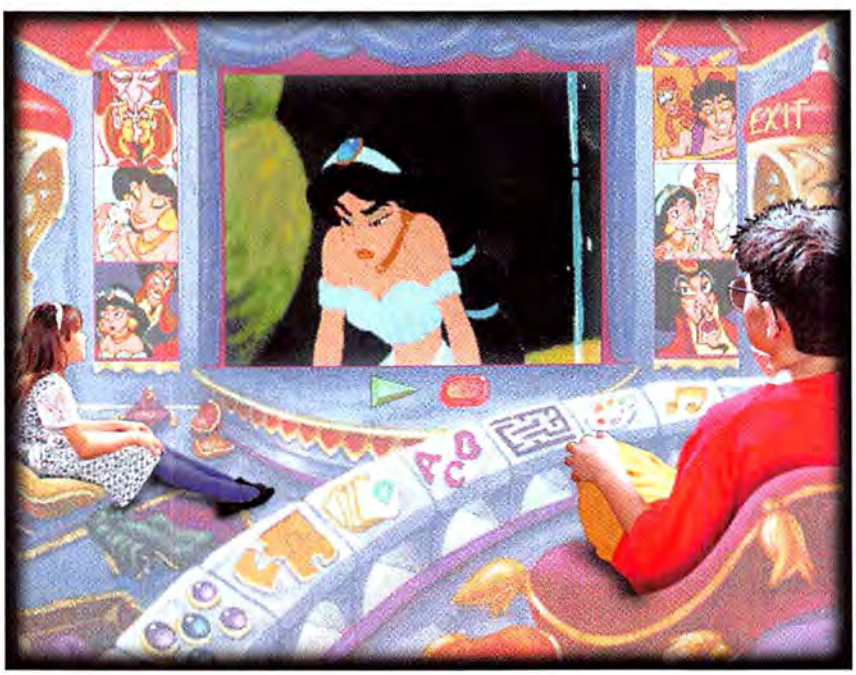
EDITED BY CHRISTINA WOOD



Consumer Watch

Sexism and Kids' Software

BY BRONWYN FRYER

Six-year-old Caitlin Baird and her brother, 2-year-old Dylan, of Los Angeles, are pretty mean with a mouse. When playing Aladdin: Disney's Activity Center, one of their favorite CD-ROMs, they can maneuver with the best of them. Click: There's bare-chested Aladdin, zooming around on his magic carpet. Click: There's buxom Princess Jasmine, being forced into marriage. And while Caitlin and Dylan learn to work with a computer, they're also learning a thing or two about gender roles.

Disney Software's Aladdin is only one of a host of new programs targeted at kids. The good news is that children's software is being touted by educators as the most exciting learning tool to come along in years. The bad news is that choosing the right software can be difficult and confusing.

Worse, even the most popular "edutainment" software can teach kids a lesson parents hadn't counted on: sexism. That's because in most programs the male characters embark on exciting adventures, while the females merely watch, await, and support them. In fact, of the 344 edutainment titles reviewed last year by the Ypsilanti, Michigan, newsletter *Children's Software Revue*, only 28 featured an active female lead.

Even products starring animal characters can typecast. "Many manufacturers like to call software with animal characters 'gender neutral,'" notes Susan Haugland, Ph.D., a child psychologist who directs the Kids Interacting With Developmental Software research project at Southeast Missouri State University in Cape Girardeau.

"But that's a cop-out. Take Stickybear ABCs by Optimum Resource. Any child can tell you that Stickybear is a boy. And the only time a female character appears is when a girl bear who is in the segment on the letter 'K' kisses him."

IS SEX IMPORTANT?

To some parents, however, the sex of Stickybear—or any other software character—is a minor consideration. "I don't see this sexual stereotyping as a big deal," says Caitlin and Dylan's mom, Deirdre, a 37-year-old property manager. "Playing with software has helped my daughter gain confidence at school. The benefits definitely outweigh the problems."

Still, experts insist that the gender stereotypes these games depict may have far-reaching effects. "Children identify with the characters in the program and absorb that this is how girls and boys are supposed to behave," says Judith Brown, Ph.D., a child psychologist in Fremont, California. "And what kids are learning is that girls are expected to be passive, decorative, and quiet, and boys are expected to be active, aggressive, and smart."

In this politically correct era, how could sexism in software even exist? Software companies claim they're simply following in the time-honored tradition of the children's book, television, movie, and toy industries. "There are two ways to develop content," says Heidi Roizen, president and CEO of T/Maker, a Mountain View, California multimedia firm. "You either create characters from scratch, or you license known winners from books, films, or television. And unfortunately," she adds, "very few known winners are female."

For this reason, getting a software company's powers that be to agree to produce a game with a lead female character is a battle. "It requires a huge amount of research, market testing, and selling upstairs," says Laurie Strand, publisher of early learning products for Broderbund, in Novato, California. For example, she recalls that despite the decision to make a female character star in the program Math Workshop, she appears only as a small figure on the package, while the male character Gus the Gorilla looms far larger.

Fortunately, many manufacturers have begun to break through the stereotype by developing female characters such as Millie the Cow in Edmark Corp.'s Millie's Math House—a character that also helps do away with the idea that "girls don't do math."

P.C. GAMES

The following programs offer examples of strong female characters:

Ages 3 to 6

Millie's Math House $40; Edmark Corp.; 800/691-2985
Reader service no. 782

Safety Scavenger Hunt $29.95; StarPress, Inc.; 800/782-7944
Reader service no. 783

Ages 7 to 9

Scholastic's Magic School Bus Series $44.95; Microsoft; 800/426-9400
Reader service no. 784

Math Workshop $39.95; Broderbund Software; 800/521-6263
Reader service no. 785

Ages 10 and up

Science Sleuths Volume 1 $59.95; Videodiscovery; 800/548-3472
Reader service no. 786

Where in the World Is Carmen Sandiego? $49.95; Broderbund Software; 800/521-6263
Reader service no. 787

TOP: ROBERT KRZYKOWSKI; RIGHT: JAMES P. KRAUS

And some companies have shown that software products with female stars can become bestsellers. For example, since the 1985 introduction of the sleuthing and geography game Where in the World Is Carmen Sandiego? the strong and smart (albeit crooked) Carmen has helped Broderbund sell more than 4 million units and has spawned a licensing program and two television shows. According to Strand, Carmen's bad-girl image has made her attractive to boys as well. Thanks to such success, manufacturers are beginning to realize that creating software with female characters could expand their market.

Some women are so convinced that girls need their own software that they're doing something about it. Janese Swanson was on the team that created Carmen Sandiego. Now she's president of Girl Tech, a toy and software firm in San Rafael, California. Likewise, Patricia Flanagan, who works for American Laser Games (an arcade game maker), now directs Her Interactive, a new division of the company.

COMBAT SEXIST SOFTWARE

Meanwhile, parents can take action to steer kids clear of negative software. One choice is to screen your children's programs carefully. Look for programs that are more open-ended and less violent, offering many paths to a final goal. But since it's not always easy to tell, it's important to sit with your children when they're first playing a game. If your child *is* exposed to a program where girls are portrayed as passive, make sure you discuss it, insists Dr. Haugland. "Don't assume that your daughter or son will disregard sexual stereotypes because they're only playing a game. Make sure they understand that the stereotypes are just plain wrong."

Consumer Watch *is written this month by guest columnist Bronwyn Fryer, a contributing editor for* PC World. *As always, you can contact* Consumer Watch *with questions or problems. We'll investigate complaints and write about issues of broadest interest. See page 12 for contact information.*

Feedback

Dangerous Security?

Guenther Heiss of Fletcher, Ohio, wrote to us regarding an experience he had with Midwest Micro. While traveling on business, Heiss put his laptop computer through the security scanner at the airport. Once on the plane, he discovered that the screen no longer worked. As soon as the plane had landed, Heiss quickly called technical support. A technician and the technician's supervisor each told Heiss that putting his laptop through the security scanner had voided his warranty and that Heiss would have to foot the bill for the repair. Incensed, Heiss wrote to us. Knowing that a security scanner should not harm a laptop, we contacted Midwest Micro. Rick Wilt, customer service manager for the company, promptly responded that a mistake had been made. The company apologized to Heiss and repaired his laptop.

At-Home Surgery

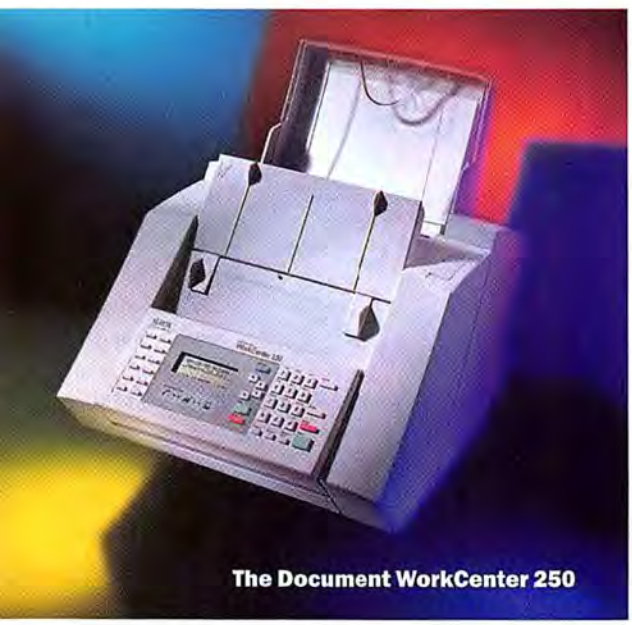
Home PC buyers are often surprised to learn that if they buy a mail-order computer they may be asked to perform open-CPU surgery. When a computer gets sick, the technician you call will want to discuss the problem to determine what's wrong. And once tech support identifies the problem, they'll often ask you to remove the offending part and install the replacement—even if you have an on-site service warranty. But things are improving. Gateway 2000, for instance, recently changed its on-site service policy. Whereas it used to be a battle to get a technician to make a house call, now you can simply explain you aren't comfortable opening the lid and schedule a time to have a technician come by.

TAKE NOTE: **The Internet isn't for nerds anymore. A recent survey says 19 percent of the 5.8 million Net users are salespeople.**

Source: Random phone survey to 29,901 U.S. individuals by O'Reilly & Associates, September 1995.

Cybertoys for Everyone in the House

Do-everything machine, digital board game, help for parents



The Document WorkCenter 250

WORKHORSE 250

Does your wallet groan under the strain of outfitting your home office? A printer is essential, and so is a fax machine. A copier would be handy. On top of all this, a scanner would be cool. Enter the Xerox Document WorkCenter 250. It's a monochrome ink jet printer, a plain-paper fax machine (which sends faxes from your PC), a copier, and a scanner. Better printers are available—even among other multifunction devices like this—but the 300-dots-per-inch output isn't bad. And it makes respectable photocopies, too. As a fax machine, though, the WorkCenter is great: It lets you schedule faxes to send later and broadcast faxes to everyone in your address book, and it scans documents at a readable 300 dpi. It's also a gray-scale scanner that uses Xerox's TextBridge Pro optical character recognition to turn those articles and what-have-you into text that can be edited in your word processor. Best of all, the WorkCenter does most of these things simultaneously: If you receive a fax while you're printing, no problem. It commits the fax to memory and prints it when the printer is available. And this workhorse measures in at only 15½ by 15 by 15 inches. —*Christina Wood*

- **Document WorkCenter 250** under $700; Xerox; 800/832-6979. Grade: B+

  Reader service no. 798

OWN PARK PLACE

"Do not pass Go. Do not collect $200." Bring back memories? Parker Brothers' Monopoly CD-ROM is every bit as fun as the board game. But in the computerized version, when you pass Go your reward cascades down in a shower of bills. When you land on Go to Jail, a siren whines and a hidden spring uncoils beneath you and propels you to the pokey. And the animated tokens have distinctive personalities: The wheelbarrow spills fruit as it passes Jail; the shoe skips gaily. Every time you land on a property, you get an animated snapshot of the neighborhood, from the barrels of toxic waste on Baltic Avenue to the fountains and imposing gates of Boardwalk. You can play on a local network, over the Internet, or against the computer. —*Angela Freeman*

- **The Monopoly CD-ROM Game** $39.99; Parker Brothers; 800/874-4607, 508/927-7600. Grade: A

  Reader service no. 799

PARENT'S HELPER

If you're planning to surprise the kiddies this holiday season with a multimedia title, do yourself a favor and buy Parent's Guide to Children's Software '96 first. In this disc/book combo, *Newsweek* editors and a group of children review more than 250

CLOCKWISE: KEVIN CANDLAND; JAMES F. KRAUS; ROBERT KOPECKY; ICONS: JOHN HERSEY

FEEDBACK CONTINUED

And Then You Pay

As if having to perform surgery on an ailing PC weren't bad enough, we got two complaints this month from Gateway customers who had to pay to ship defective parts back to the company. Spokesperson Wendell Watson confirmed this is the company's policy. But he added that if you have to ship parts back repeatedly, you should ask Gateway to help with the costs. Mail-order companies have varying policies on who pays for the shipping. Ask about a company's policy before you buy.

Get Out Your Credit Card

If you've upgraded to Windows 95, start thinking about if and when you'll need technical support—the ground rules are changing. It used to be that hardware manufacturers offered free lifetime support for preinstalled operating systems. But vendors are cutting back with Windows 95. AST, Dell, and IBM, for example, now offer 30 to 60 days of free Windows 95 support. After that, you have to pay.

Virtual Correspondence School

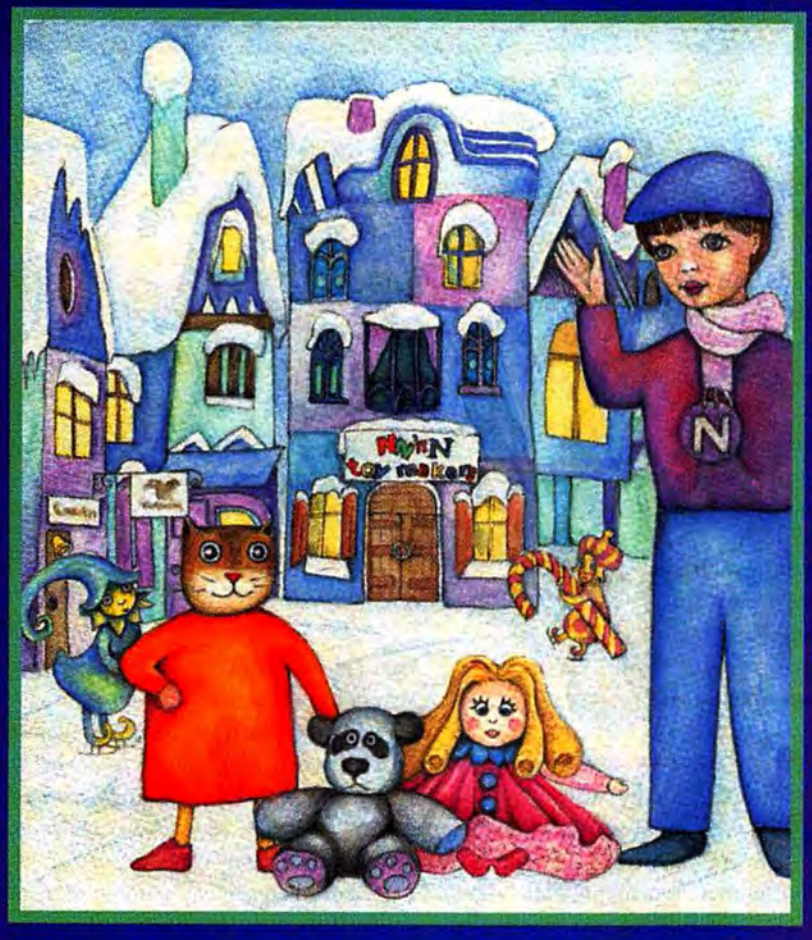
Now getting into college is as easy as getting online. America Online and the University of California at Berkeley are planning to deliver accredited courses and lectures via modem. Look for a schedule of classes on America Online (keyword school) by the time you read this.

TAKE NOTE: Brace yourself for a new CD-ROM format in 1996. One High-Density Compact Disc will hold as much data as 25 of today's CD-ROMs. The catch: You'll have to buy an HDCD drive to play 'em.

Food for Thought

Planning a feast for the holidays? If you need a little help planning the menu, ask the Electronic Gourmet Guide, at http://www.2way.com/food. Ask chefs for sage advice, get a quick recipe, or take a cooking class from a pro. You can also get there via America Online (keyword egg).

By Christina Wood



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software titles. The disc offers tours of the 50 best titles; the rest are reviewed in the accompanying book. The book—a collection of report cards—is a quick way to get an unbiased assessment of lots of programs. But the interactive reviews are a lifesaver. After you've identified yourself as an adult or a child, a guide asks what interests you. Then your guide will give you a tour of the inside of the program. These are not canned demos. There's no better way to prepare yourself before you head to the stores. —*Christina Wood*

- **Parent's Guide to Children's Software '96** street price $29.95; *Newsweek;* 800/634-3002. Grade: A

  Reader service no. 800

IF YOU KNEW SUSHI...

Both more and less than a CD-ROM cookbook, The Beauty of Japan Through the Art of Sushi is a nibbler's sampling of Japanese culture, a deluge of texts covering history, geography, tea ceremonies, and artful seafood. Illustrations, though gorgeous, are sparse, and once you get to the heart of the program—the recipes—you'll be hungry for visual demonstrations of the skills required to master these morsels. Although detailed and accurate, the recipes force you to slog from menu to menu to look up basic preparations or get translations (from Japanese to English only). There's no search function to speed your navigation through this snail-paced disc. If you know sushi, the program may help increase your range, but novices will do better to seek a well-illustrated paperback book. —*Naomi Wise*

- **The Beauty of Japan Through the Art of Sushi** $40; Arome Interactive; 916/894-8407. Grade: D

  Reader service no. 801

A denizen of the deep peers out of Cousteau's World.

DIGITAL CHAPERONE

Net Nanny will keep your kids out of trouble when they are wandering the wild and woolly Internet. You supply Net Nanny with a list of forbidden text strings: *sex, bomb, Barney,* whatever you want. Next time Junior tries to access alt.sex.farm.animals or look up nitroglycerin recipes, Net Nanny will shut down the active application. While the program's primary purpose is to keep innocent eyes away from the Net's seamier side, parents can also use it to prevent kids from typing nasty things like format c:. The dictionary of taboo phrases is encoded and password-protected, so the little rascals can't edit it themselves. Our only quibbles: The installation procedure is primitive, and defining a list of forbidden phrases can be a chore. Available for DOS and Windows. —*Dan Miller*

- **Net Nanny** $49.95; Net Nanny Ltd.; 800/340-7177. Grade: B

  Reader service no. 802

COUSTEAU'S UNDERSEA WORLD

Once you figure out how to bypass the cute but clumsy submarine that shuttles you through seven undersea laboratories, you can dive into the depths of Cities Under the Sea. This debut CD-ROM from Jean-Michel Cousteau's World Series boasts excellent underwater photography, an abundance of scientific data, and perhaps most significantly, the ecological consciousness we've come to expect from any project bearing the Cousteau name (Jean-Michel is Jacques's son). This beautifully realized amalgam of videos, slide shows, animation, text, and moderately pontifical lectures affords a detailed and entertaining study of energy flows, living communities, biodiversity, adaptations, change and evolution, and the relationships that define life in the coral reefs. —*Derk Richardson*

- **Cities Under the Sea: Coral Reef** $49.95; Enteractive; 800/452-9999. Grade: B+

  Reader service no. 803

SQUASHED TOADS

Mortal Kombat, kiss the concrete. There's a new game in town—Battle Beast—one of the best computer games of all time. It's about disgustingly cute creatures boppin' each other, then turning into gigantic killer robots for some serious fighting. You get plenty of weapons to blow your socks off—and blast your opponent. The animation is better than some Saturday morning cartoons, and the action is intense. The variety of moves is mind-boggling. Fortunately there's a training mode to keep your mind from over-boggling. If you look, you can find plenty of undocumented moves (try pressing **F**, then **V**,). Take it from this 12-year-old, Battle Beast is an awesome game. —*Elijah Kinch Spector*

- **Battle Beast** street price $49.99; 7th Level; 800/884-8863. Grade: A

  Reader service no. 804

NEXT MONTH

Look for *PC World*'s Top 5 Home PCs in this section starting in February. We'll examine the factors that matter when you're buying a home PC, and we'll rank the systems that make the grade. We'll also run the PCs through our rigorous Windows 95 multimedia benchmark tests, see how they handle popular multimedia titles, rate them on user interface and ease of setup, and look into the companies' reputations for service and reliability. We'll report on the five winning systems so you can decide which computer is right for your home.

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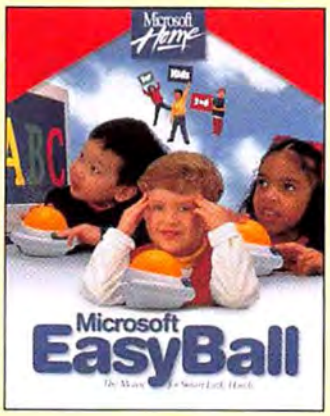

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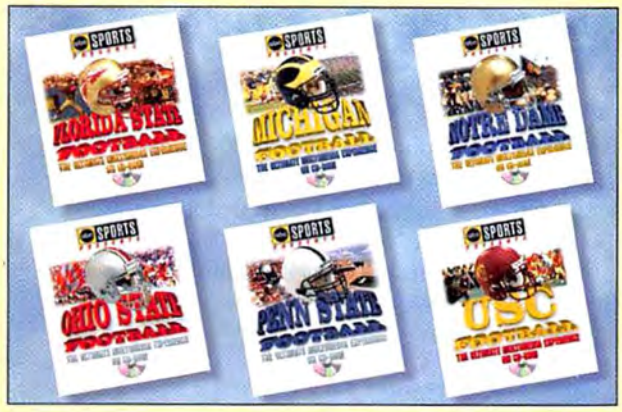

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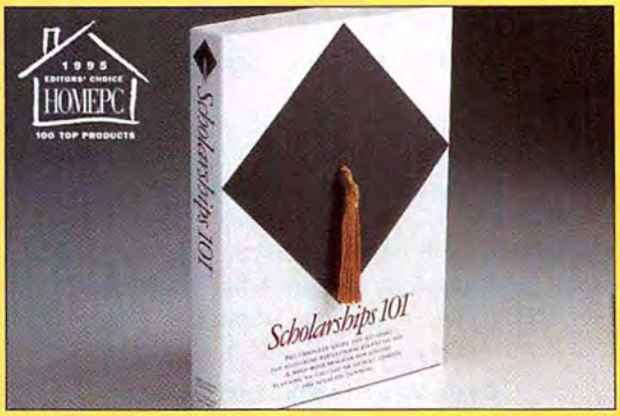

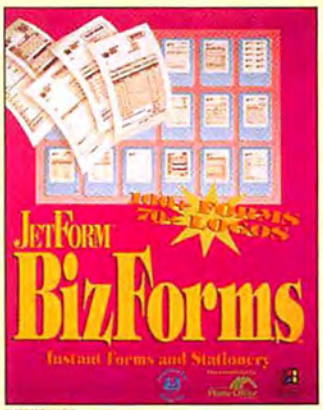

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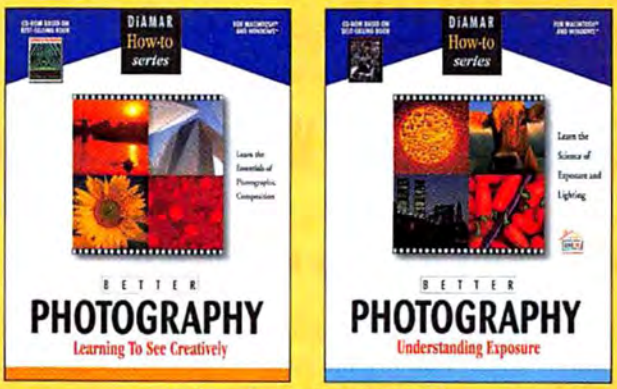

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800-U-SMILE-2

Circle 207 on reader service card

Deck the Cards With Fonts of Holly

Making Christmas cards...the hard way.

BY LINCOLN SPECTOR

Ever make Christmas cards on your computer? I haven't. But then, I'm Jewish and I've never made Christmas cards at all. I have, however, made birthday cards, party invitations, and bar mitzvah notices on my computer, so I have some experience with that particular pseudocreative process.

At this point I should give you all the good, solid, practical reasons for creating your own Christmas cards. Unfortunately, I can't think of any. Buying ready-made cards is both faster and easier, and the result is sure to look more professional.

But creating your own cards is a lot more fun. Homemade cards may not impress your clients, but your parents—the folks who taped your kindergarten drawings to the refrigerator—will love them.

Now that I've convinced you, here are a few tips for making the best-looking cards on your computer:

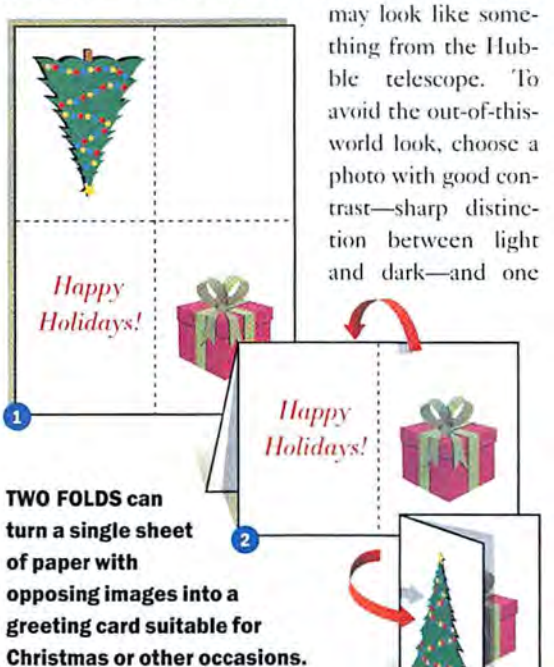
Don't use your word processor. At least, not unless you're incredibly clever with it. A proper card is not only pleasing to the eye; it also comes with an inside, an outside, and a fold. You could, in theory, set up a foldable document on a word processor. You could also, in theory, write the great American novel on Post-it notes.

There are, I'm glad to report, several programs that do all the positioning and rotating for you, freeing you to concentrate on your creativity. If you don't have any creativity, these programs can hold your hand throughout the design process (not literally of course—that would require additional hardware).

My favorite such program is Microsoft Publisher. It's extremely easy to use, walking you through the entire process of creating a card, but letting you make your own decisions whenever you get up the nerve to do so. And when you work on your own, Publisher continually pops up hints and suggestions. For more details on Publisher and its competitors, see Steve Bass's November *Home Office*.

Do whatever you can to make the card personal. There's no point in making run-of-the-mill, impersonal Christmas cards on your computer—you can buy those. So turn off your software's mind-reading feature and position the elements yourself. Integrate some family news into the card ("This year, Rover surprised us by having nine kittens, making us question his gender and species"). Write your own poetry or plagiarize Dylan Thomas. Scan a family photograph and pop that into the card.

But be careful which photograph you choose. After a scanner and printer are done with it, your gorgeous family photo may look like something from the Hubble telescope. To avoid the out-of-this-world look, choose a photo with good contrast—sharp distinction between light and dark—and one that doesn't contain a lot of fine detail and subtle gradations in color. Of course, the better your printer, the better your image will look. Color truly beats monochrome here.



TWO FOLDS can turn a single sheet of paper with opposing images into a greeting card suitable for Christmas or other occasions.

If you don't have a scanner, go to your local copy shop. The photo option isn't limited to people with scanners. Many photocopy stores offer desktop publishing services, including scanning. If you want to scan only one or two photos, this is by far the simpler solution.

In the majority of these places, you can either rent time on store equipment or else have employees scan your photos overnight. Unless you enjoy using out-of-date software on inadequate hardware (with the meter running—and with assistance only from a Macintosh-trained clerk who's not sure how the scanner hooks up to the token Windows machine), then you should pay to have someone else scan your photo. It'll probably cost you less than $10, and it's pretty painless.

Make your cards feel like cards. That means using stiff, good-quality, paper—65 pound, if your printer can take it. (Standard, high-quality stationery is generally about 20 to 24 pound.) Check your printer's documentation to see how high it can go; if you're not sure, buy a few sheets of heavy paper and experiment. If you have a monochrome printer, choose a colored paper stock, although not something neon bright (you want to give relatives a warm feeling, not a headache).

Have a merry Christmas. Or whatever you have this time of year. And if a computer-ignorant relative asks where you got the lovely cards, just smile, nod, and buy them a subscription to *PC World*.

- **Microsoft Publisher** (version 2.0 for Windows 3.1, CD Deluxe for Windows 95) $79.95; Microsoft; 800/426-9400
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Lincoln Spector is a PC World *senior associate editor. See page 12 for contact information.*

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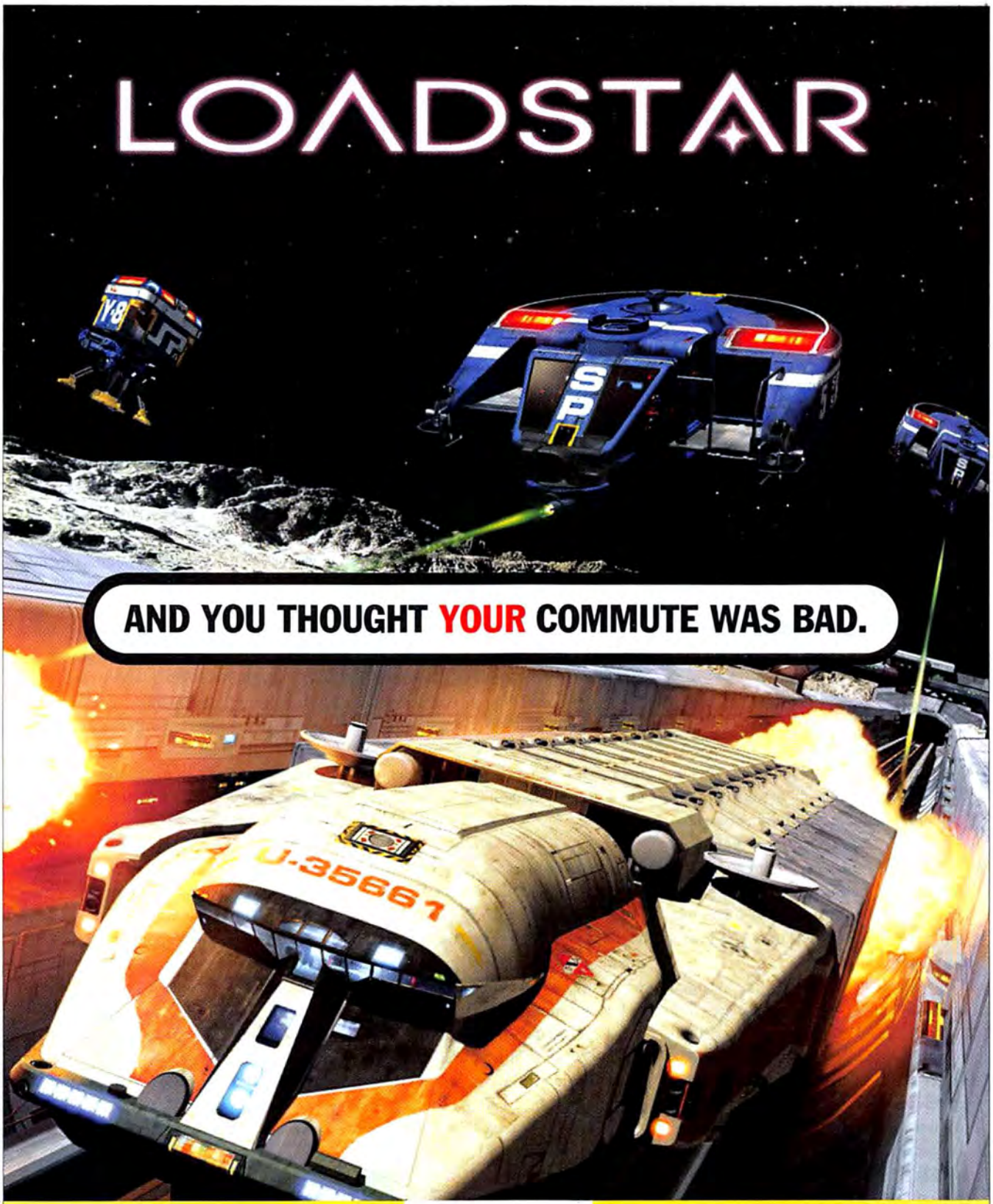

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Danger on the Desktop

Is monitor radiation a threat to your health?

BY STEVE BASS

I didn't have a care in the world: The sun was shining, there were no deadlines looming, and I didn't owe anyone a cent. Then out of the blue, I read this article on the Internet about my monitor emitting electromagnetic radiation. Great; just what I need—something new to worry about. And the more I read, the more I worried.

But there's a glimmer of hope. I learned how to minimize—if not eliminate—the risk of living and working in a computerized environment. I've got some recommendations, and I suggest that you act on them right away.

You see, anything with electricity running through it produces electromagnetic fields, or EMFs. But some gadgets produce more than others. There's a ton of research about EMFs and illness, and the final verdict isn't in yet. But some studies—most notably from the Institute of Occupational Health in Helsinki, Finland—show significant evidence that exposure to computer monitors may cause miscarriages. Don't just take my word for it—read about it for yourself. If you have access to the Internet, you'll find a terrific World Wide Web site on the subject if you point your browser to **http://infoventures.com/**.

To find out whether you're at risk, you'll need an extremely low frequency magnetic field meter. You can buy one for about $140 to $200, but you don't have to. Many power companies will measure your home's EMFs at no charge. I'm lucky because my electric company, Southern California Edison, offers the service for free. If your utility company doesn't, don't let that stop you. Say the magic words: "I'm concerned about the EMFs in my home. Can somebody come out and measure them?" If nothing else, they may lend you the testing equipment.

WHAT HAVE YOU GOT?

My greatest concern—as should be yours—is your computer's monitor. With a borrowed meter, I tested my Sony Multiscan 17se low-EMF monitor, knowing that if the meter passed 2.5 milligauss in a place where my body is often situated, I needed to be concerned. With the meter next to the screen, I got a frightening level of 6mG. That's nothing—the sides and back of the monitor measured 32mG. But good news: From where I sit—with my nose 34 inches from the screen—the EMF level is 0.1mG, pretty safe. My other worry was the uninterruptible power supply that sits on the floor, just inches from my ankle. Its EMF level proved to be a whopping 110mG.

I measured everything else in sight—phone, laser printer, scanner, and computer—and while all emitted some EMFs, my usual sitting location was far enough away to be safe. (The real surprise was that the needle didn't budge for my coffee.)

I checked the rest of the house and found some unpleasant surprises. The microwave oven produced 500mG; safe levels were 5 feet away. The most devastating was the electric clock on my nightstand. The clock cranked out a staggering 752mG—just 6 inches from my head—8 hours, each and every night. Swell.

THE SAFE HOME OFFICE

This is serious business that calls for immediate action. First, move everything that plugs into an electric outlet at least 2 (preferably 3) feet from where you sit. Don't stand in front of a working device, such as your printer when it's churning out documents. And for goodness' sake, if your office is next to a bedroom, make sure the bed and equipment are not against adjoining walls. Check levels from the *bedroom* side.

If you discover that an older monitor is cranking out EMFs—and you can afford to get rid of it—buy one with low emissions. Low-EMF monitors are common and aren't necessarily more expensive. In fact, NEC Technologies, MAG InnoVision, and ViewSonic sell *only* low-emission monitors. When you shop, make sure the monitor adheres to the Swedish MPR II standard or the more stringent TCO certification.

So now I've gone from worrying about it to doing something about it. My parents must have been visionaries: They used to tell me not to sit so close to the TV.

Contributing Editor Steve Bass is a licensed marriage and family therapist and president of the Pasadena IBM Users Group. He can be reached on PC World Online. See page 12 for contact information.

TALK TO US: You can e-mail the editors of the PC World @Home section at home@pcworld.com, and write to us at 501 Second St. #600, San Francisco, CA 94107. We're eager to hear your responses and opinions about any topic related to home computing.

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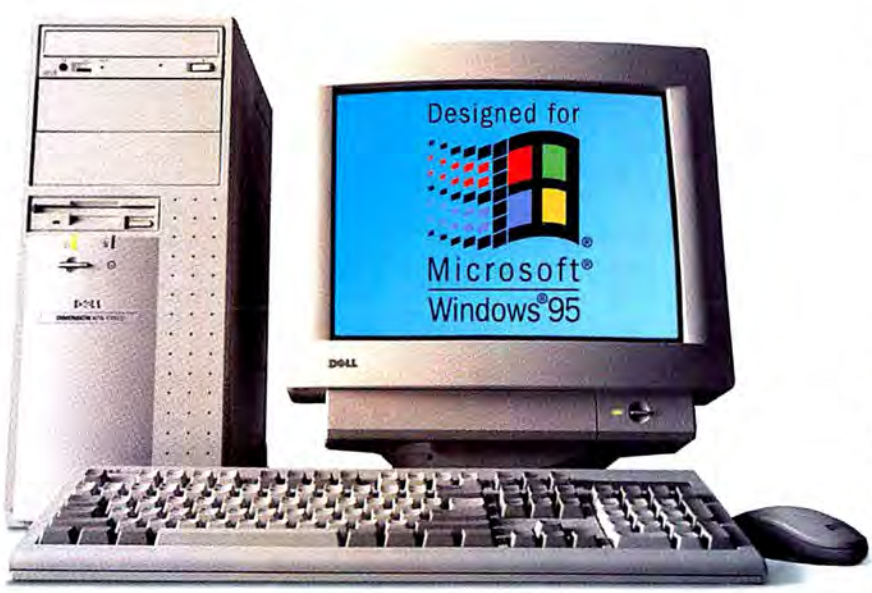

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