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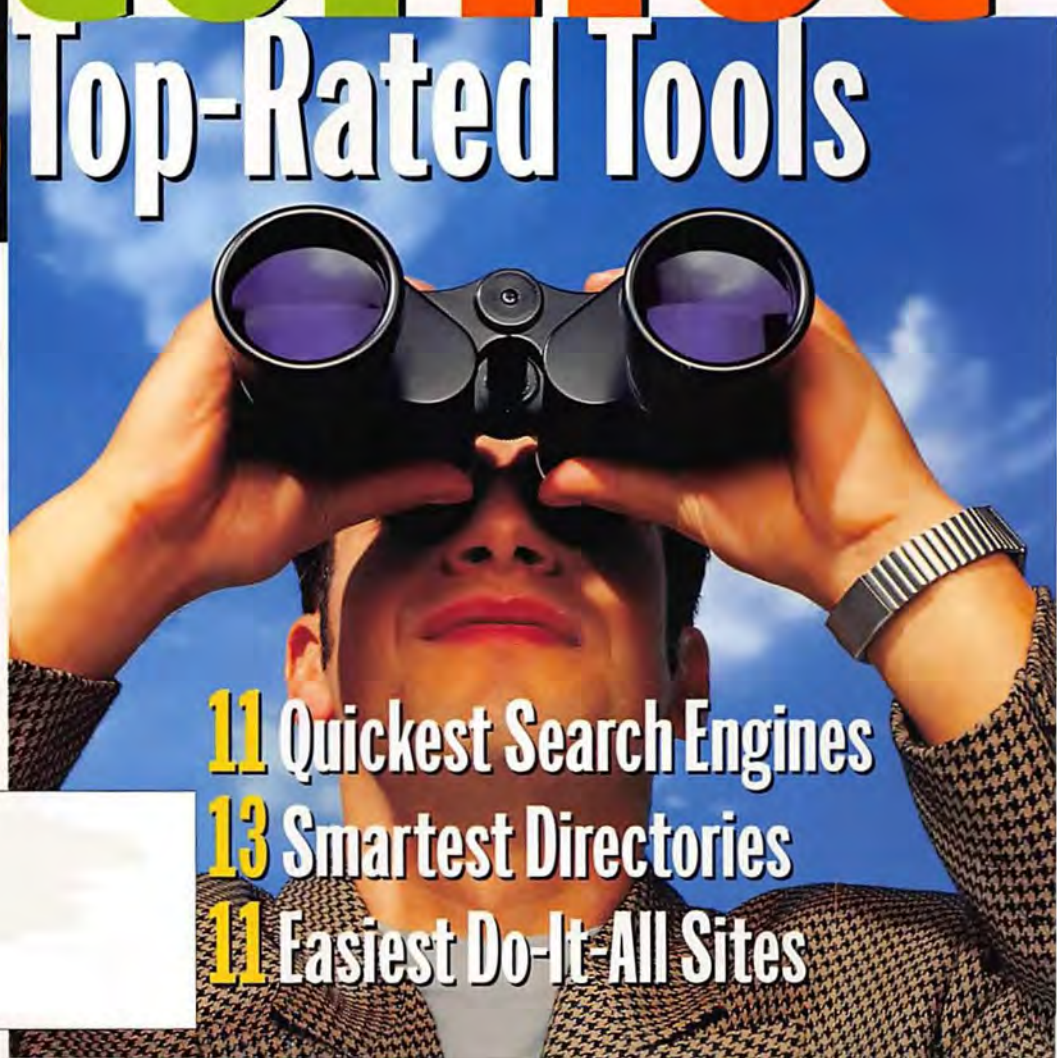

11 Quickest Search Engines

13 Smartest Directories

11 Easiest Do-It-All Sites

Introducing new Microsoft Office for Windows 95

Software that reveals itself, removes the barriers between you and capabilities old and new. Software that doesn't get in your way when you're trying to work.

Features that can streamline the way you work now reveal themselves as you work. Everyday tasks as basic as entering text are easier. Spell-checking and formatting happen automatically, on the fly. Applications that you once used in a limited fashion now offer you new and easier ways to use them, to do more with them. One of those ways is the Answer Wizard. When you have a question you simply type it in. "How do I get this page to print sideways?" It will show you how. Other wizards are built into individual programs to walk you through complex tasks. To create a customer database from scratch, you simply ask the Database Wizard to show you how. This is called IntelliSense™ technology, and it senses what you are doing, and helps you do it with fewer steps. It lets you focus on your work, not on making your software work.

Now applications work together, work alike, work the way you always hoped they would.

New Microsoft® Excel, Word, PowerPoint,® Microsoft Access, and Schedule+. Use them to work more effectively, to access and share information throughout your company, to conduct more in-depth analysis. Pull information from one application into another seamlessly. Manage your key contacts in Schedule+ and drop addresses into Word when you write them letters. Use PowerPoint's Meeting Minder to take notes of your meeting, and then export them to Word to summarize. Use the new Office Binder to create a single document that uses components from all five programs. Combine a cover letter, financial projections, and professional-looking charts and graphs seamlessly into one document. Save and print it as one. Open it and have all the applications it uses launch at once. You spend less time going back and forth between programs. Less time working around obstacles. More time focusing on the task at hand.

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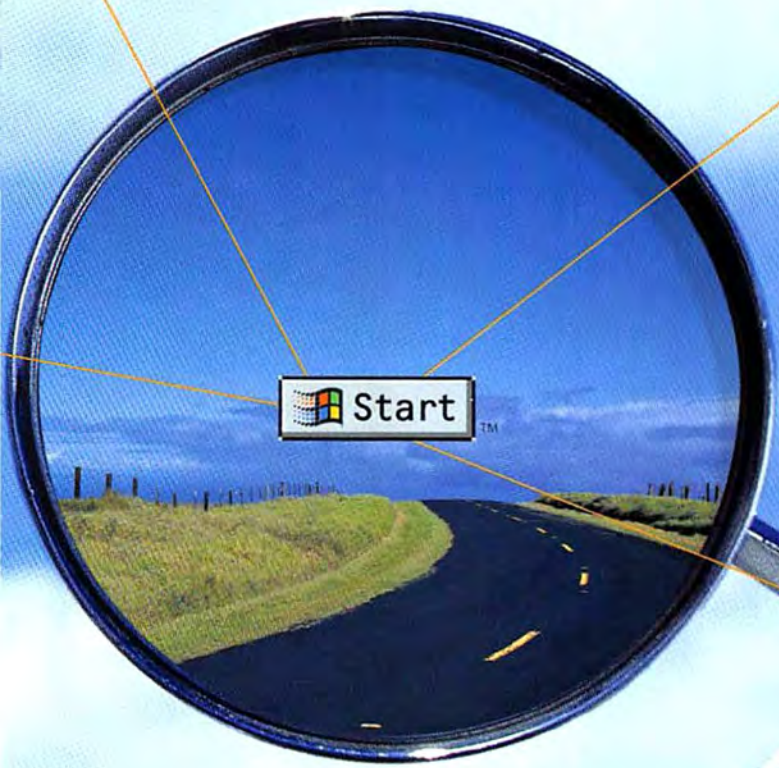
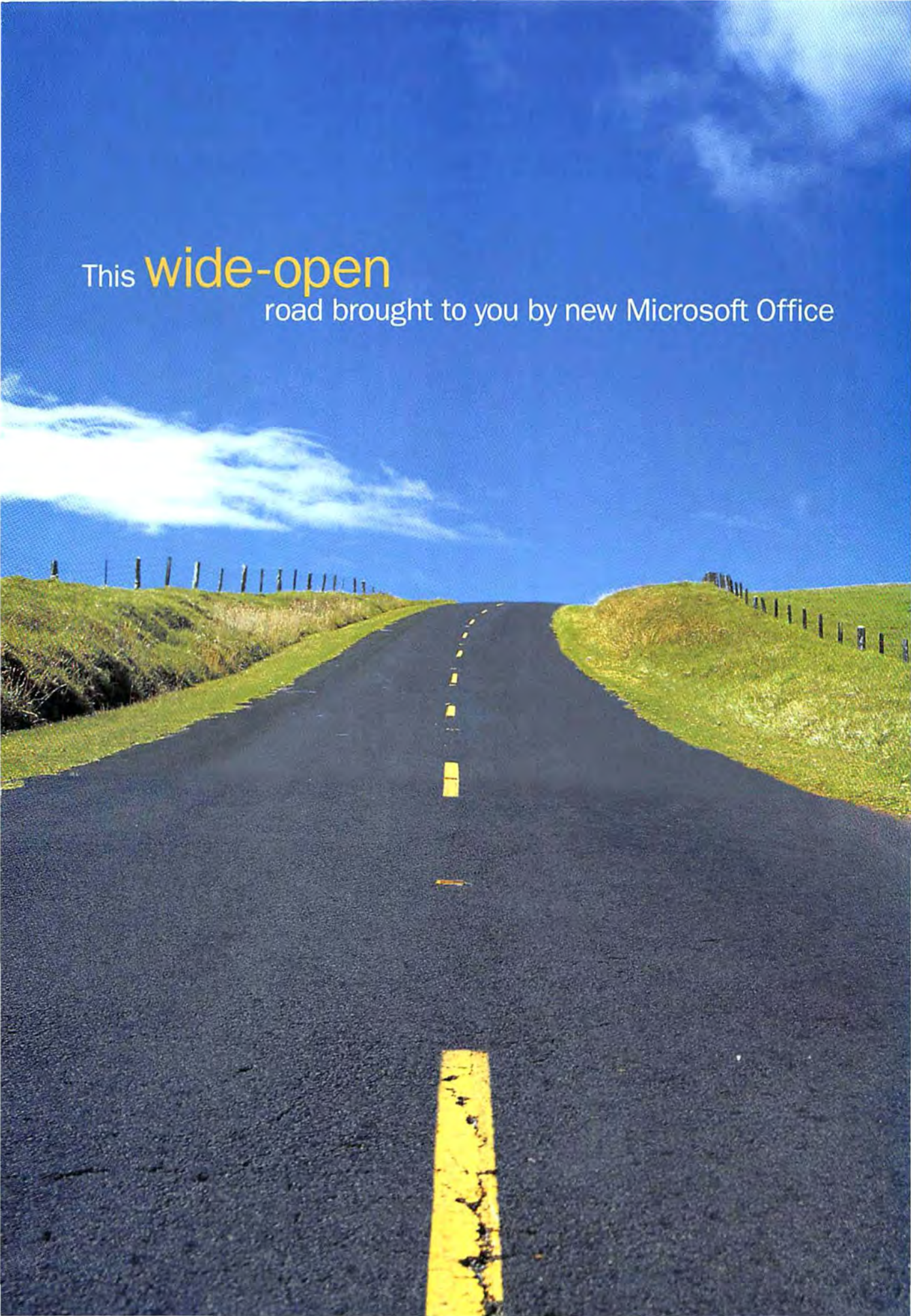
Together, the programs break down the barriers between you and other people. You find new ways to communicate, to share information, to collaborate.

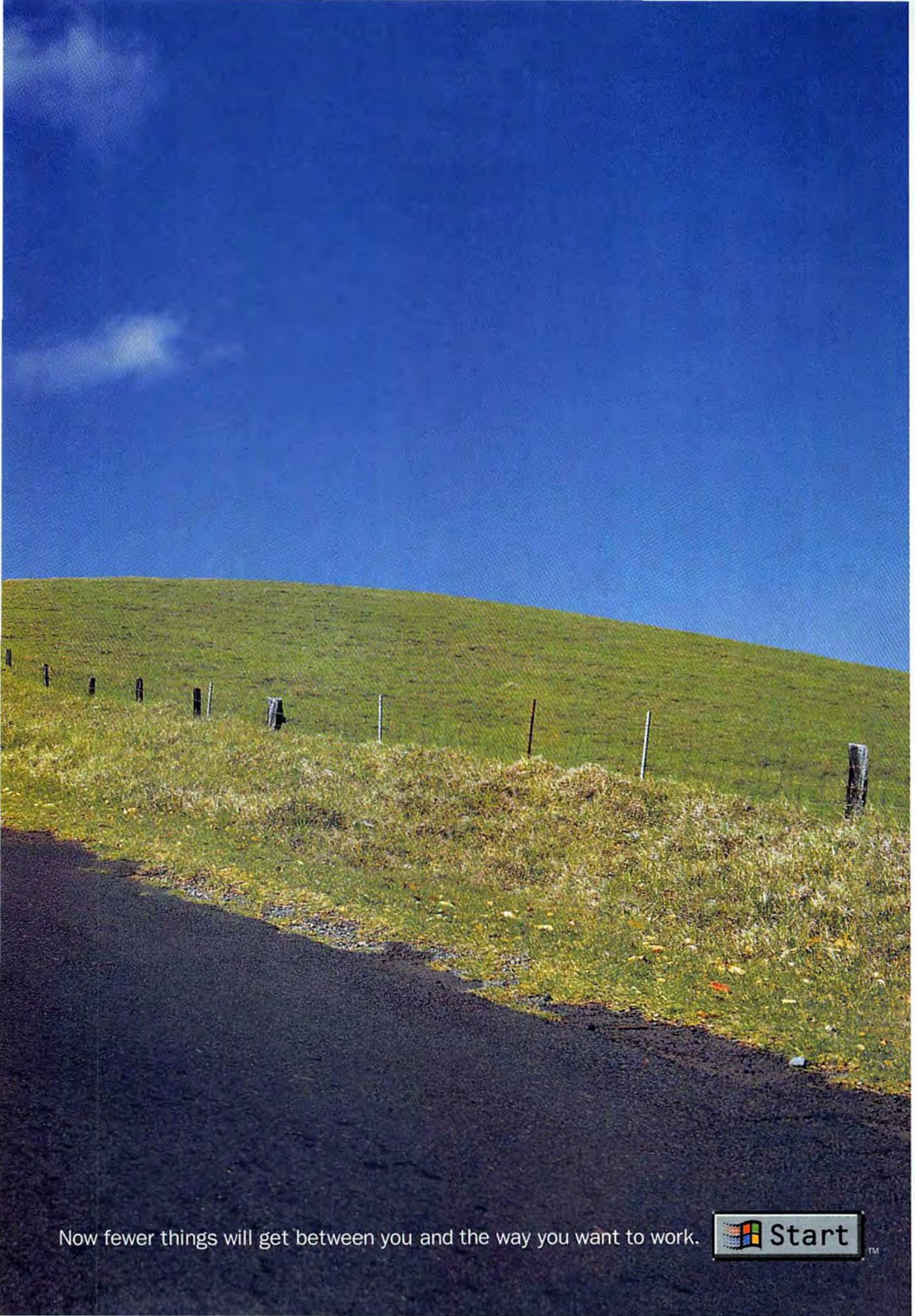
Now you can use Microsoft Word as your e-mail editor with the Microsoft Exchange Inbox in Windows 95. Create your messages in Word, and use all of its functionality, its formatting options, to communicate more clearly, more convincingly. With Word's Internet Assistant, you can browse the World Wide Web and publish your own documents there. If you subscribe to The Microsoft Network, you can access it directly from Office. FindFast lets you search company servers and individual desktops for information you need by typing a phrase or key word. Even finding the information you need to schedule a meeting is made simpler with the Meeting Wizard in Schedule+. It can find a time when your list of people can meet, locate a conference room, and notify everyone of the time and place.



Now you can take full advantage of Windows 95.

New Microsoft Office was designed to work hand-in-hand with the Windows® 95 operating system and its simplified user interface. To make the most of 32-bit performance, long filenames, shortcuts, multitasking, and the Windows Explorer. Together, they make computing fundamentally easier and faster. They make it possible for you to spend less time computing, more time working effectively.


This wide-open
road brought to you by new Microsoft Office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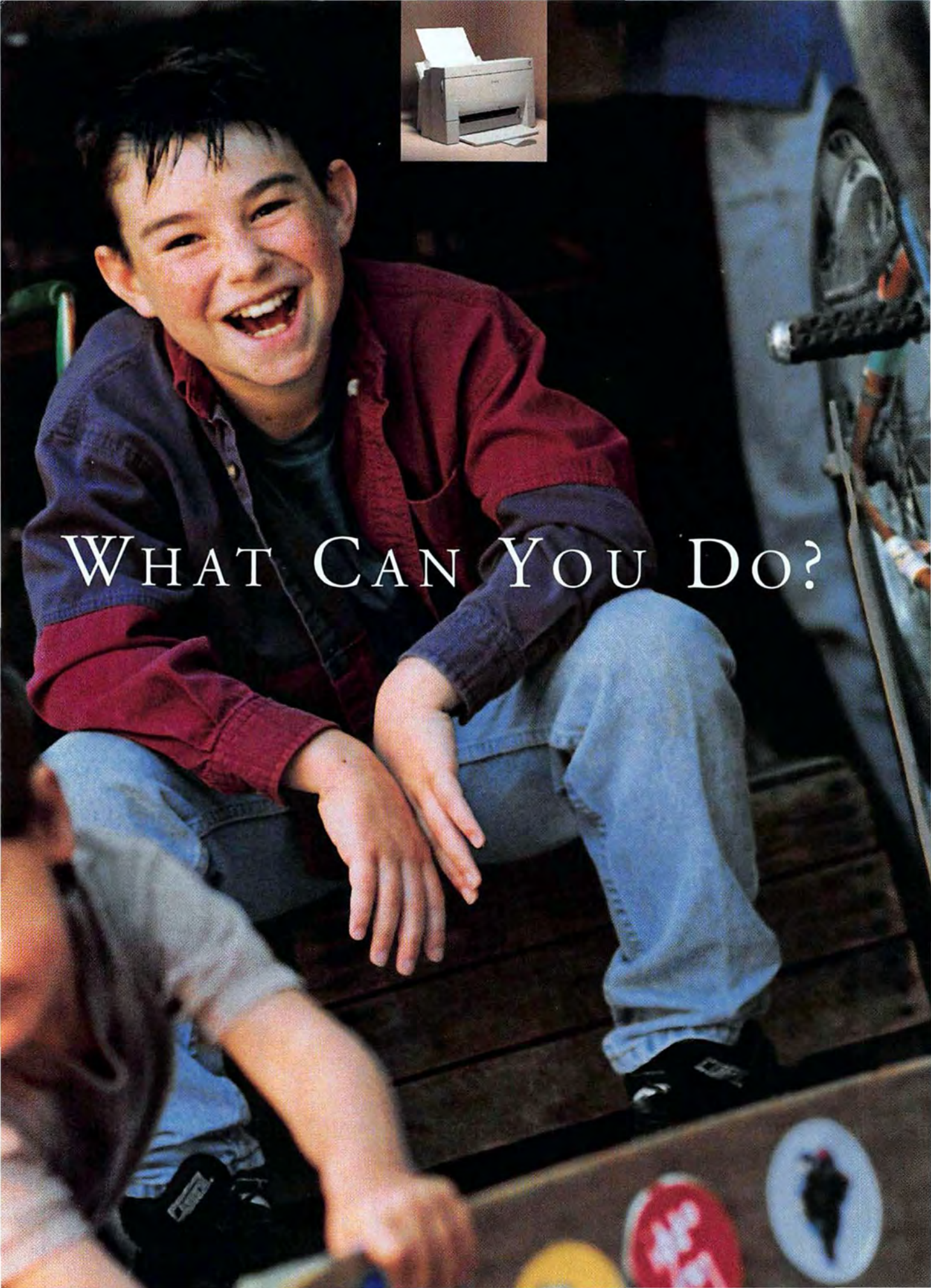
Start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COOL STICKERS

PC WORLD

Cover Story

124 Special Report: Find It on the Net

Lost among the World Wide Web's millions of pages? Wasting time downloading the wrong files from obscure Gopher and FTP sites? Hooked up to newsgroups that don't address the topics you thought they would? With enormous depositories of information organized haphazardly and linked all over the world, the Internet is a confusing place to be—unless you know how to find what you're looking for. *PC World* counted 60-some tools designed to sort it all out and took a critical look at 10 of the most popular. Read on for our 3 top picks. Plus, a quick guide to all-in-one metasearch engines, a rundown on directories from Starting Point to Galaxy, and tips for streamlining searches.

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129 One-Stop Shopping: Metasearch Engines

Cover photography by Stan Musilek

Windows 95 Tips

136 95 Essential Tips for Windows 95

Windows 95 isn't as easy as you'd thought. So we've compiled the greatest Win 95 tips, including cool tricks to launch files and keep desktops clean, dynamite keyboard and menu secrets, and much more.

Windows 95 Survey

163 Win a DTK Quin-35M/P75

How do you like Windows 95? Fax in this survey for a chance to win a DTK Quin-35M/P75, a PC from this month's Top 20s.

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172 Do-It-Yourself CD-ROMs

With models starting under $1000, CD recording systems promise to be the VCRs of the nineties. We tested seven packages and found they're not as simple as they're cracked up to be.

Consumer Resources

187 The Digital Advocate

Can your PC be a financial, legal, and consumer advocate? We sifted through software, scoured the Net, and grilled experts in search of the best consumer resources.

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40 SmartSuite 96: Back in the Ring Again

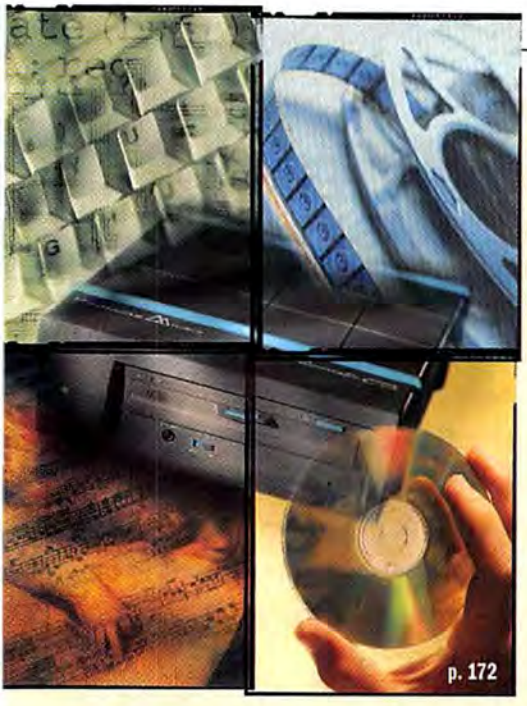
The Windows 95 version of Lotus's office suite is impressive, with more apps, a lower price, and a great set of workgroup tools, but there's one drawback: It's missing 32-bit versions of 1-2-3 and Organizer.

46 RAM Doublers No Substitute for Real RAM

Can $50 software provide the benefits of hundreds of dollars of RAM? We tested leading RAM doublers and found they can actually degrade PC performance.

50 150! 166! 200! Pentiums Soar

Blazing speed rules as we test-drive the first 150- and 166-MHz Pentiums, Cyrix 6x86s, and 200-MHz Pentium Pros.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Are the lives of you and your officemates an endless stream of overlapping meetings and lost business cards and contacts? PIMs may be your key to a more organized business life. *PC World* picks the best time and contact managers for you and your workgroup.

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Prices in our Top 20s dropped as much as $700, and the end is still not in sight. With the latest CPUs debuting, the new year brings a lotta bang for your buck. Today's best bets: A pair of Dells, Micron's P133 Millennia, and Toshiba's Portégé 610CT.

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The Right Tool For Your Job.

The ZEOS Pantera. Now with more speed, more memory, bigger hard drives, your choice of operating systems and new lower prices. It's today's modern solution to getting your job done right.

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At ZEOS, our philosophy is to make sure that you, our customer, get the best of everything. And that starts with performance. The heart of the Pantera is an award-winning ZEOS-designed motherboard. Already called "Overall performance leaders" by *PC Magazine*, the Pentium® processor-based Pantera line is now boosted even further with the addition of EDO DRAM, synchronous burst SRAM cache options and CPU choices all the way to the new 133MHz Pentium processor. In plain English, we've turned on the afterburners—giving you performance unlike anything you've seen before!

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.

The bottom line is that virtually no one else gives you any of these features to protect your investment. At ZEOS we give you them *all*!

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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
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
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Windows Magazine 1994 Recommended
Pentium-90 November 1994

WINDOWS 1995 WIN 100
Pentium-90 May 1995

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90MHz	**$1645**	**90MHz**	CN! **$2245**	**90MHz**	CN! **$2645**
100MHz	**$1695**	**100MHz**	**$2295**	**100MHz**	**$2695**
120MHz	**$1795**	**120MHz**	**$2395**	**120MHz**	**$2795**
133MHz	**$1895**	**133MHz**	**$2495**	**133MHz**	**$2895**
➤ 8MB EDO RAM		➤ 16MB EDO RAM		➤ 24MB EDO RAM	
➤ **528MB** local bus EIDE hard drive		➤ **850MB** local bus EIDE hard drive		➤ **1.2GB** local bus EIDE hard drive	
➤ 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	
➤ **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	
➤ 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	
➤ **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 Works 95** or MS Works		➤ **MS Office Pro 95 & Bookshelf 95 CD,** or MS Office Pro & Bookshelf		➤ **MS Office Pro 95 & Bookshelf 95 CD,** or MS Office Pro & Bookshelf	

Included With Every ZEOS Pantera:

- ➤ Genuine Intel® Processor. ZIF socket for easy upgrading to a future OverDrive® Processor..
- ➤ Diamond Stealth PCI local bus SVGA color graphics card with 1MB DRAM, upgradable to 2MB DRAM.
- ➤ Flash BIOS for easy upgrading.
- ➤ On-board PCI local bus Fast SCSI-2 and Ethernet LAN options.
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- ➤ Slots: Three PCI & five ISA.
- ➤ 6 SIMM slots for low-cost memory upgrading. EDO RAM expandable to 384MB.
- ➤ ZEOS 101-key space-saving keyboard.
- ➤ 200 watt power supply with built-in surge suppressor. Switchable between 115/230V.
- ➤ EPA Energy Star compliant.
- ➤ FCC Certified Class B; UL Listed.

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Pentium® Processors

90MHz	CN! **$2695**
100MHz	CN! **$2745**
120MHz	CN! **$2845**

- ➤ 16MB EDO RAM, 256K synchronous SRAM cache
- ➤ **1.2GB** local bus EIDE hard drive
- ➤ **4X CD-ROM** drive and 3.5" 1.44MB floppy drive
- ➤ **Diamond Stealth 64** PCI local bus SVGA color graphics card with 2MB VRAM
- ➤ **ZEOS 15"** 1024 x 768 NI SVGA color monitor, .28mm dot pitch
- ➤ Ten-bay vertical case with two cooling fans
- ➤ Microsoft Mouse
- ➤ **MS Windows 95,** or MS-DOS 6.2 & Windows for Workgroups 3.11
- ➤ **MS Office Pro 95 & Bookshelf 95 CD,** or MS Office Pro & Bookshelf

Best MM Supreme

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- ➤ 32MB EDO RAM, 256K synchronous SRAM cache
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Circle 237 on reader service card

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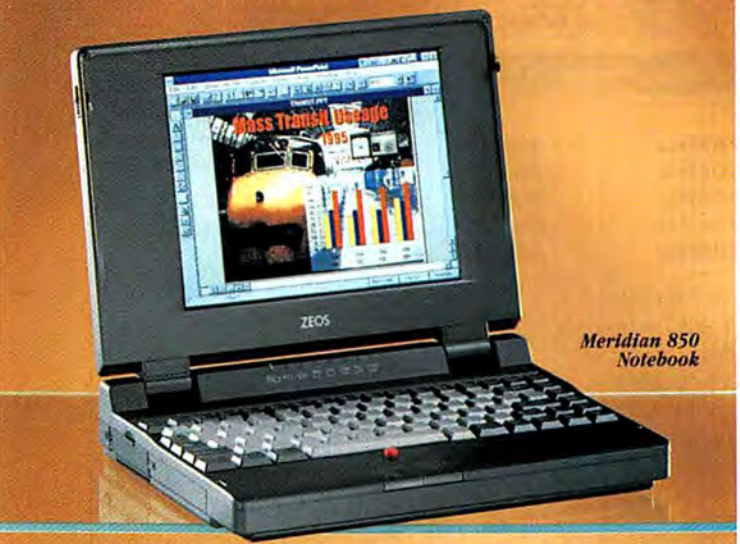
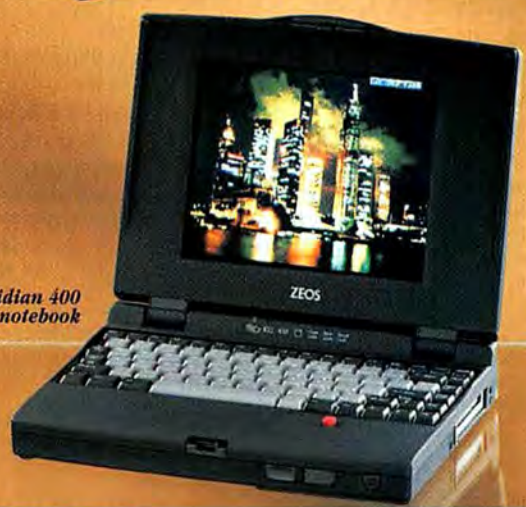
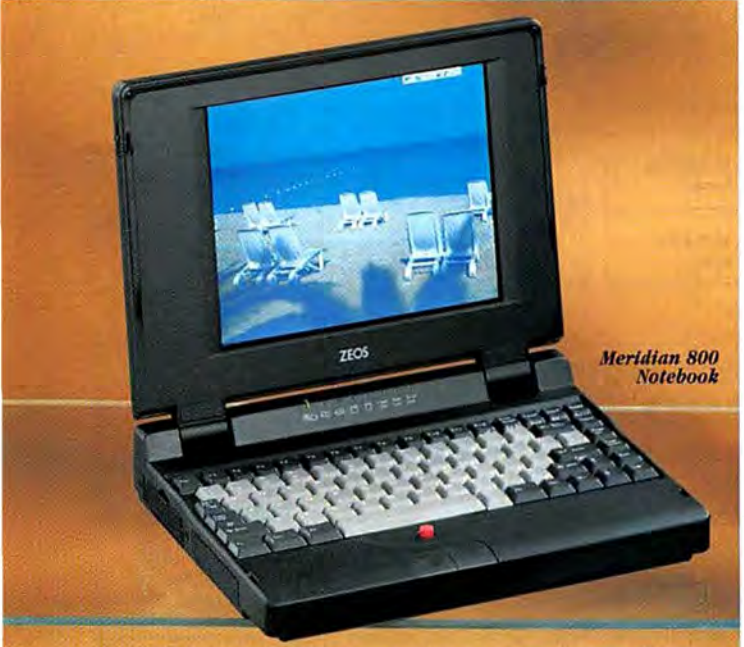


Meridian 850 Notebook



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 MAGAZINE 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 MAGAZINE 1995 WIN 100 May 1995

"The 800A 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 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 810MB, 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!

Buy With Confidence

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.

With the ZEOS Meridian notebooks, you can go anywhere and be productive. Their performance, quality, reliability and durability make them a first-class travel companion. And it's easy for you to get on board. Just call your ZEOS Systems Consultant for a tour now at 800-554-5220. You won't want to miss it!

Package 1

	400C	800A
DX4-100	$1495	$2695

- 4MB RAM
- 260MB IDE hard drive
- 800: Internal 3.5" 1.44MB floppy drive
- 400: 7.9" dual scan display; 800: 9.5" active matrix display
- MS-DOS 6.2 & Windows for Workgroups 3.11
- MS Works

Pentium® Processor	850C
75MHz	$2995
90MHz	$3195

- 8MB RAM, 256K synchronous SRAM cache
- 528MB IDE hard drive
- Internal 3.5" 1.44MB floppy drive
- 10.3" dual scan display
- Integrated 16-bit stereo sound
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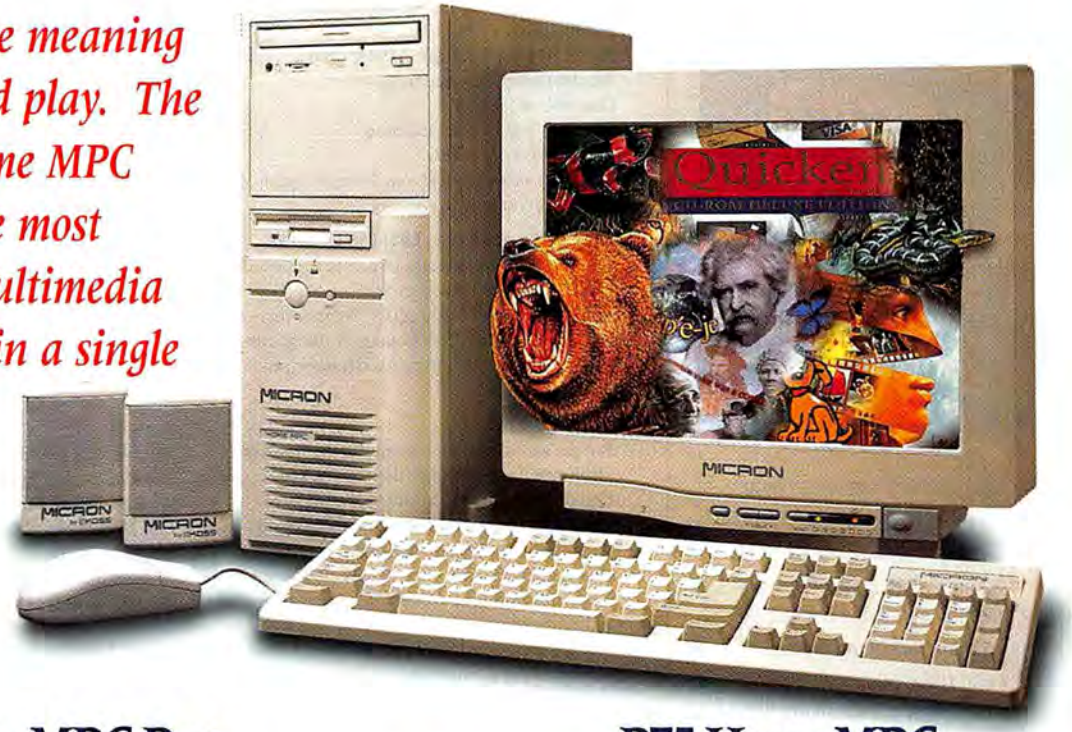

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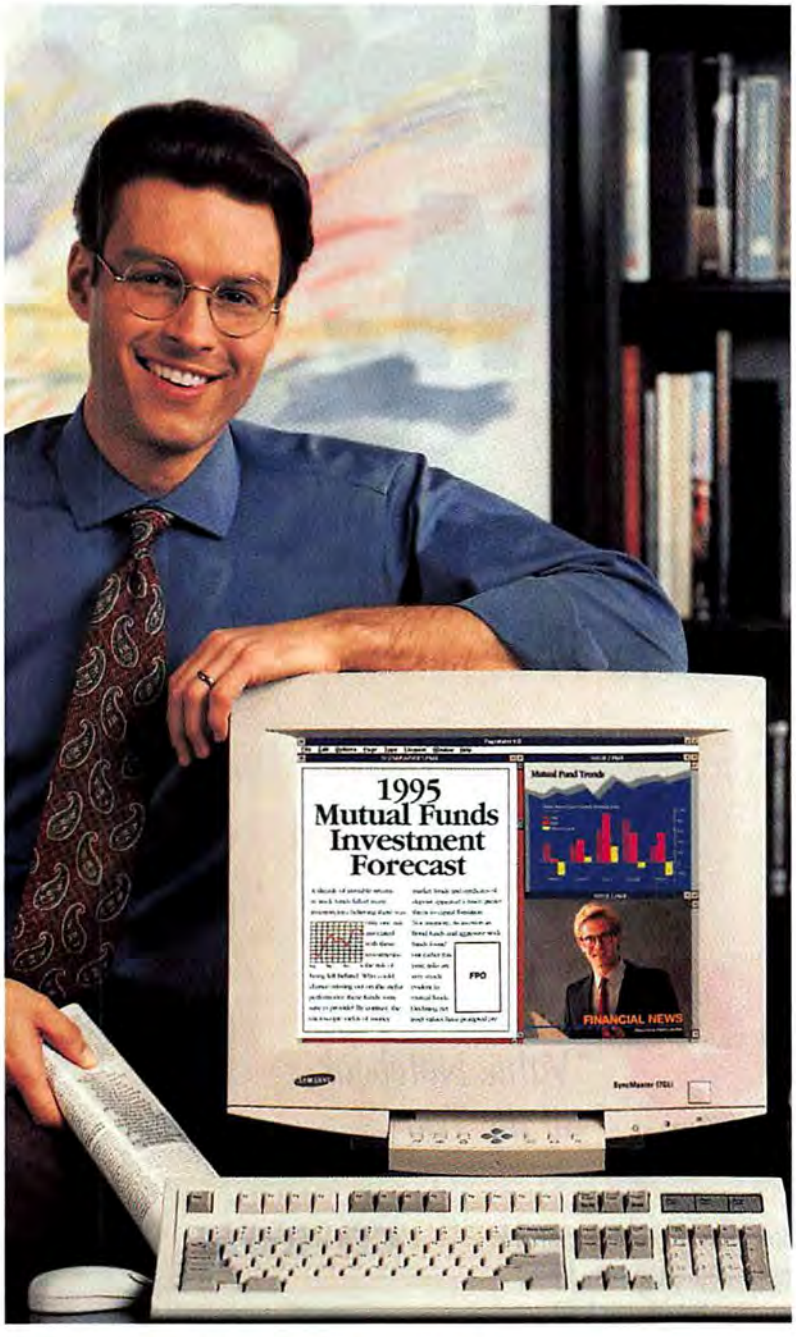

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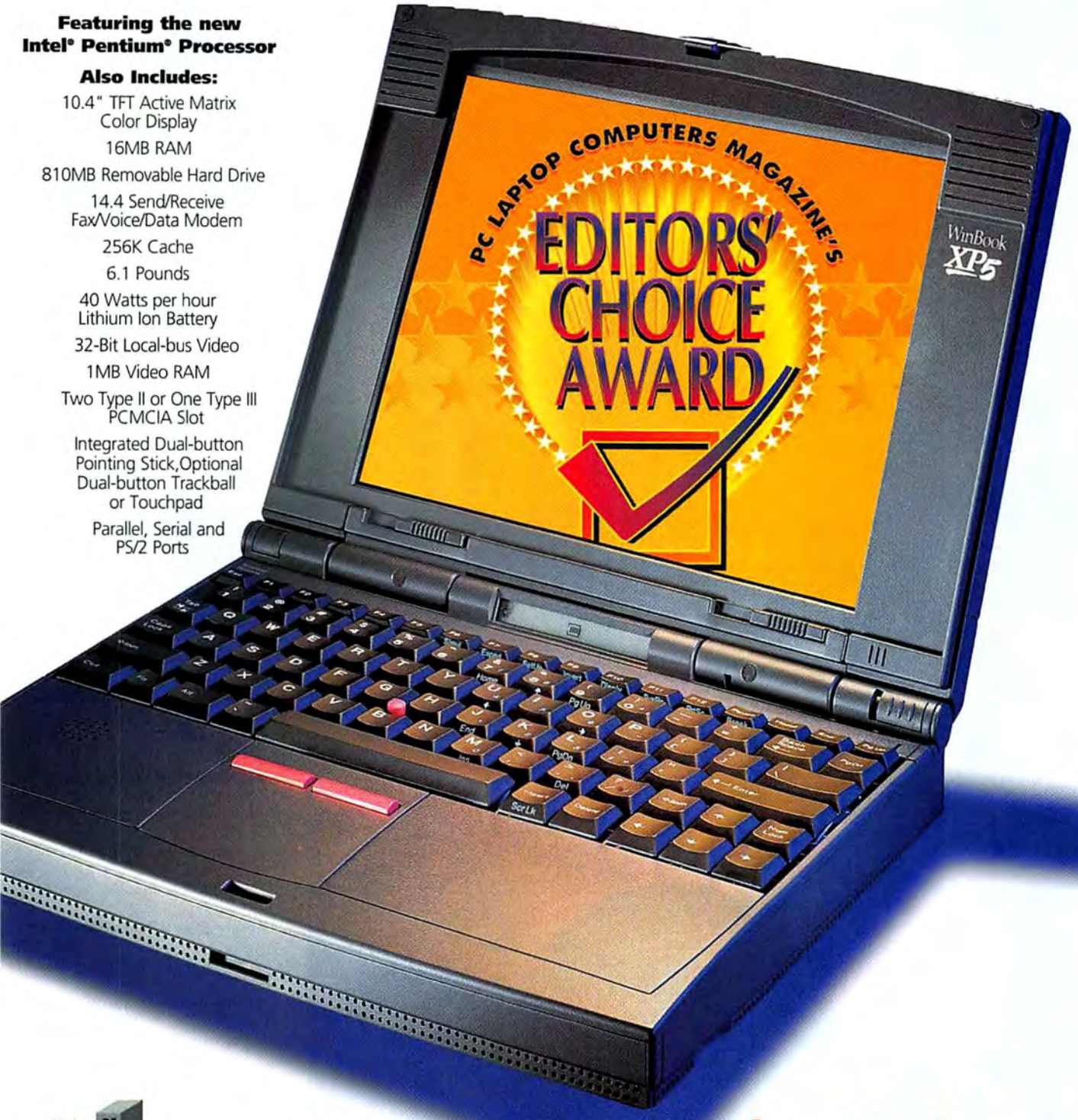

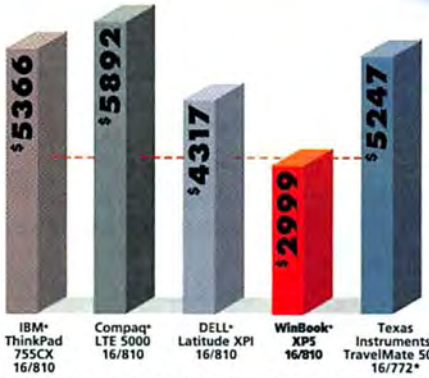

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A Guide to the Best Internet Search Tools

ERIK BUTLER

If you think finding files on your hard disk is frustrating, try finding information on the Internet. At most, hard disks hold a measly one or two gigabytes of data. In contrast, by one estimate, World Wide Web servers connected to the Internet hold more than 7 million pages' worth of information. Add the downloadable files on over 13,000 Gopher and FTP servers and the content of thousands of Usenet newsgroups, and the term *information overload* takes on a whole new meaning.

The sheer quantity of information is just part of the problem. Even worse is the questionable value of much of the available information. A trail of hyperlinks *can* lead to precisely the credible, well-researched information you're after. But more often than not, that trail will send you down a dead end to some idiosyncratic personal home page that only a parent could love.

If browsing the Net for hours on end is your preferred recreation, so be it. Many of us, though, barely have the time to log on, let alone spend hours serendipitously pursuing all the wonderful stuff the Web has to offer. But the beginning of a solution is in place. Enterprising companies and individuals have devised search tools for the Internet, and like the Internet sites they seek to catalog, these tools are multiplying rapidly and they vary in quality.

This month's cover story and special report, "Find It on the Net," is your guide to the best Internet search tools. As author and contributing editor Richard Scoville reports, general directories such as Yahoo and the Whole Internet Catalog are useful for initial exploratory forays into a topic. But when you're after specific information or files, better yet are *search engines*, Web sites you access with browsers just as you'd access any other Web page. Essentially, search engines consist of two parts: a database that indexes contents of Web pages and other resources on the Internet, and a query form that lets you type in keywords related to the topic at hand and then retrieves links to pages relevant to that topic.

That, at least, is the hope. As Scoville finds in this special report, not all of the 60 or so search tools available are worth your while. He tested 11 of the most popular, up-to-date search engines by feeding them queries and then evaluating the quantity and quality of "hits" they returned. Among his favorites: Lycos, which indexes more than 1.5 million Web pages, and InfoSeek, which indexes fewer Web pages but includes Usenet newsgroups. Both are among the most accurate search tools now available. One of the newest and best search engines, Excite NetSearch, uses contextual searching to make it simpler to construct effective queries and retrieve a greater number of relevant hits.

Even the best of these search engines is far from perfect, and their capabilities are constantly evolving. To a large degree, success in finding what you want still depends on the skill with which you select keywords and construct queries. Look to our special report for simple tips and strategies for conducting efficient searches.

Windows 95 Tips Ahoy

Also in this issue is our first collection of tips for mastering the intricacies of Windows 95. Almost everyone who upgraded quickly to the new operating system is accustomed by now to its interface and has taken a first pass at reorganizing their desktop and files. But most have also probably tried to do a few things that they can't quite figure out or simply aren't permitted to do.

In "95 Essential Tips for Windows 95," you'll find all sorts of useful shortcuts and tricks: a guide to using drag and drop, which behaves inconsistently in the new operating system; tips for getting around the mess of cascading menus associated with the Start button; emergency start-up tips; a handful of useful keyboard shortcuts; safeguards for working with the Registry; and advice for sharing files with colleagues who use Windows 3.1 or another operating system that can't yet take advantage of long file names.

More often than not, a trail of hyperlinks will send you to some idiosyncratic personal home page that only a parent could love.

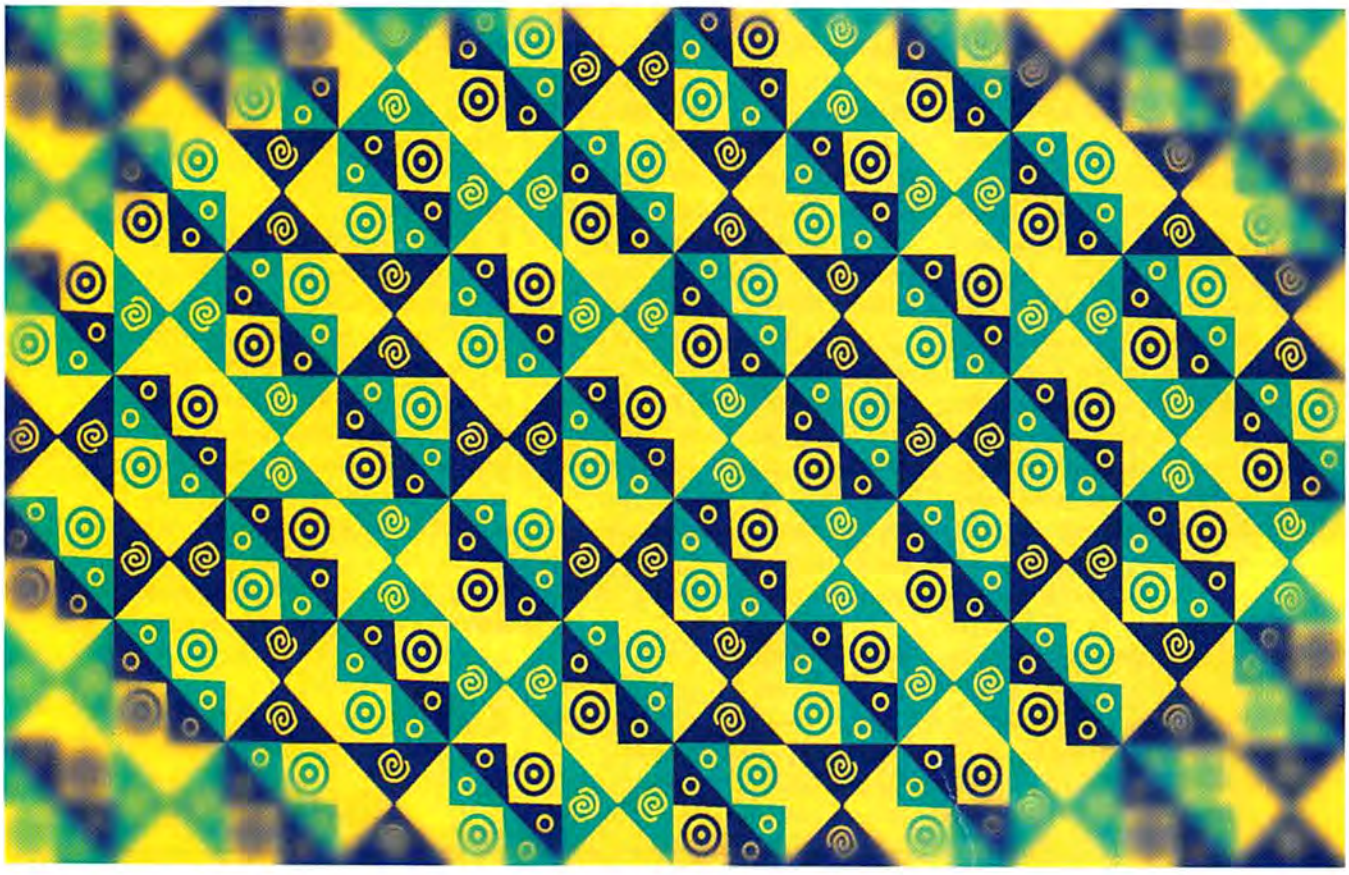
Save Your Dough

Readers who use any version of Windows, OS/2, or even DOS, should turn to "RAM Doublers No Substitute for Real RAM" in *Top of the News*. The PC World Test Center loaded these packages on 486/66 and Pentium-90 PCs to see if, as advertised, they resolve resource constraints and let you run more apps. Our findings: Only some perform as claimed. Moreover, with Win 95, they actually hamstring your PC's performance. You'd be better off spending your money on the real thing.

Cathryn Baskin, Editor

Our Monitor

Their Monitor



THE EDGE OUR MONITORS GIVE YOU IS VERY CLEAR.

When you consider what size monitor to buy, you should also consider how much of the monitor's screen is usable.

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This technology gives the MultiSync XP21 monitor sharp focus across your entire image. Even along the edges and corners of the screen.

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All this makes the MultiSync XP21 monitor perfect for graphic design, color pre-press, CAD/CAM, document imaging and other high performance uses. If your computing falls more into the areas of page layout or sophisticated business applications, check out the MultiSync XE21™ monitor.

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intel inside
pentium PROCESSOR

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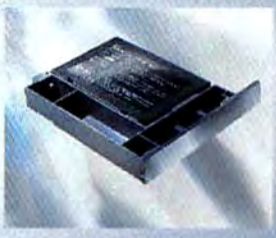
AND TIMES WHEN YOU DON'T.



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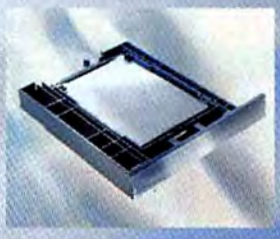

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Window To Your Mind's Eye

Samtron's 17" monitors offer pictures so crisp, so clear, they truly provide a window to your mind's eye. Winner of *Byte Magazine's* Best Monitor Overall for Image Quality award, praised by *Windows Magazine* ("You'll Like What You See") and highly recommended by *PC Digest & Ratings Report*, Samtron's 17" monitors offer flicker-free resolution, sharp edge-to-edge focus and energy-saving features perfect for the home or office.

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PLUG & PLAY NUTEK SAMTRON

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Resellers circle 204 on reader service card

Gray-Market Blues, Locker-Room Talk

Trust Your Motherboard

Perhaps cosmic forces were involved, or maybe it is better to be lucky than good, but I found your "Best Upgrades for Your 486" article [November] to be quite a help.

Recently I bought a Dell Pentium-120 for my office, but then felt driven to upgrade my 486DX-33. I thought I could pick up an upgrade chip at a computer show, but the vendor warned me that I'd have to step down the volts on my motherboard to avoid frying the chip. I understand now, thanks to your article, that he was selling a "gray-market" chip. While I appreciate the vendor's warning, I guess he didn't feel motivated to tell me that he wasn't selling an OverDrive chip.

This caused me some grief, as I left feeling betrayed by my motherboard (i.e., for her failure to step down her voltage). And it's not right to feel betrayed by most mother-anythings. I understand now that there has been no betrayal, and thank you for your role in our reconciliation.

Charles Herbert, Napa, California

No Longer Worlds Apart

Hooray! I'm taking a much-needed break from a project on women, computers, and the Internet. I picked up my just-purchased *PC World* and read Cathryn Baskin's "From Locker Room to Living Room" [*In This Issue*, November].

Women are a viable force in computers: industry, development, science, and just plain recreational use. The hype that there are no women in the cyberlandscape is just that: hype. And we—women with computers—are comfortable, happy, and eager to use our machines. Some of us like the challenge of downloading "fixes," and I know a few women with wallpaper fetishes, but overall, Baskin is right on track in noting that women and computers are no longer worlds apart.

Thanks for the straightforward way you assume women to be part of your audience of knowledgeable computer users, and thanks for your information on computers.

Laurel Gilbert, Bowling Green, Ohio

Focus on Business

As a man, a manager, and a technical PC user, I have to say that I was offended by the stereotypical column by Cathryn Baskin [*In This Issue*, November].

While I certainly appreciate, enjoy, and even strive for the best "speeds and feeds," my focus is on business. I strongly believe that this is true among the majority of my colleagues, both men and women. Does the computer help me do my job better; is there a justifiable cost-benefit; is it more than just a toy? By dismissing the stereotypical view of the men in PCs, you perpetuate it. I can point to computer users of both genders who are speed freaks.

The usefulness of your magazine is based on the content and the business value to me, not your opinions of men versus women. While I think that a collaboration with *Working Woman* magazine is fine and potentially beneficial, the tone of the article implies that you had to do this because none of the men you worked with could provide insights into these topics.

I think you owe both the men and the women in your readership an apology for representing them as a class, rather than as individuals.

Thomas J. Scales, Dallas

Charting More Hardware

Bravo on the inclusion of more than just entire systems for the monthly Top 10 and 20 lists—this is probably one of the most helpful things any PC mag has done for a long time.

A problem I have, though, is that the modems reviewed are only external

models. I probably wouldn't even consider one because I don't have much desk space to spare—I bought a huge GW2k tower model last year so I could put those types of gadgets inside it.

Another problem is that the only printers included are the expensive networkable models. Although I am in the process of starting a home-based business, I have no need for a networkable, PostScript-enabled, billion-page-per-minute printer that sells for more than my monthly salary.

My computer knowledge and equipment expectations go beyond the average home user's. It would increase the value of your Top 10s and 20s to people like me if you included models that are not necessarily for LANs, and at the same time didn't gear the articles to the "What does RAM mean again?" types. (The way they are now, they're really not very useful, except as general brand commentary.)

Lisa M. Otey, San Francisco

BILL MAYER

Editor's response: It's true that a lot of modems our readers purchase are internals. However, when we first tested V.32bis modems, we found almost no difference in performance between the external and internal versions of the same modem. So we started with the externals. Now we're adding PC Card–based modems to our Top 10 tests. Our Test Center is also comparing the internal and external versions of newer V.34 modems to see if they still have equal performance.

On the topic of printers, we alternate each month between personal printers and workgroup printers. Prices for our monochrome workgroup printers range up to about $2500, so they're really not what we would define as high-end units. —*Tracey Capen, executive editor*

Old-Fashioned and Grateful

While I understand that *PC World* must keep up with the times and provide thorough coverage of a new product, especially one as "important" as Windows 95, I am extremely gratified that you didn't follow the example of other major PC magazines and devote an entire issue to it. I hope you will continue to remember that not all of your readers have switched (or intend to switch) to Windows 95.

I, for one, have no plans to change to an operating system that would require me to spend an extra five or six hundred dollars just to upgrade my hardware. After the hardware expense, one must then consider replacing a fair number of software programs in order to take full advantage of Windows 95.

Continue to include articles and columns on Windows 95—they are most interesting and informative—but please continue to include an equal number of articles and columns for us old-fashioned PC users, who are more than content with Windows 3.1 and MS-DOS 6.2.

Richard Altman,
Clear Lake, California

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blowtorch cookery/body language/ supercharged minivans>>>

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Counting the Dots

No doubt, the Lexmark Optra R deserves the Best Buy [*Top 10 Workgroup Printers*, November], but, uh, you may want to check it out a little further. True, this is a 600-dpi printer, and it's a 300-dpi printer, but, best of all, it's a 1200-dpi printer!

HP dominated the laser market from the inception, but in November 1994 Lexmark beat it at its own game: bringing each iteration to market with improved functions, at a lower price than the product it replaces.

The Optra printers richly deserve the accolades and deserve to be described as what they are—1200-dpi printers.

Bob Lay, Davenport, Iowa

Editor's response: The Lexmark Optras are true 1200-dpi printers only if you configure them with 8MB of RAM or more. In their standard configurations, which is how they were tested, the Optras can print only at 600 dpi. I agree, however, that we should have mentioned they can print true 1200 dpi if you buy more RAM. —*Melissa Riofrio, associate editor*

Cruelty to Automobiles

Stephen Manes's *Full Disclosure* column in your November issue, "Fit and Finish: Anyone Want a Yugo?" states that in the realm of software quality, Windows 95 is a Yugo.

Isn't that being too harsh—on the Yugo?

Arthur Impastato, Internet

Corrections and Clarifications

The photo captions identifying James B. Norman and Garry Weber were inadvertently transposed in December's "Windows 95: The First 30 Days" [*Top of the News*].

In "Attention, PC Shoppers" in the November issue, we should have said the warranty for the CTX EzBook 400D is for two years. Also, daily toll-free phone support is now available 24 hours a day, not 9.

In October's *Hardware* column, the Okidata 600e was mistakenly criticized. The model number should have been the OL410e.

PC World regrets the errors.

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

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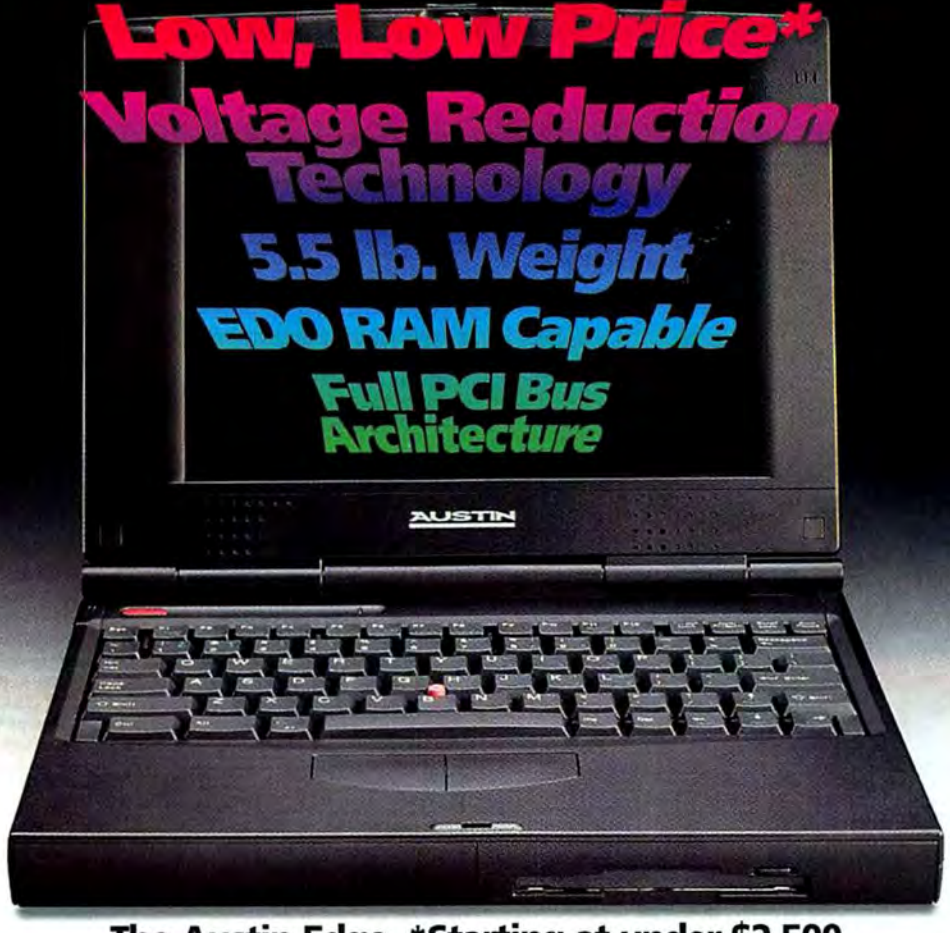

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PC Magazine, *Editor's Choice Awards, May 30, 1995 Issue*

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Source: *PC Magazine*, July 1995

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Taming the Message Monster

Many of us can't imagine life without fax machines and voice mail, although these technologies can be as annoying as they are productivity enhancing. Take faxes: No one enjoys wrestling with curly pages, and a third-generation fax can be indecipherable. While the alternative—hardware and software that lets you send and receive faxes from your PC—overcomes the curly paper problem, it requires you to leave your computer on all the time to get those 11th-hour messages. And of course, you'll still have to listen to those long voice mail messages and check all your e-mail, too. Before you know it, you've spent much of the day just sending and receiving messages.

This month, Sonya Brooks, co-owner of Professional Financial Management Inc., a holding company in Atlanta, Georgia, describes how she established a dedicated fax and voice mailbox on the World Wide Web, cutting curly paper out of her life and consolidating all her message sources in one place. —*Editor*

ANN STATES

Sonya Brooks is co-owner of Professional Financial Management in Atlanta, Georgia.

Life on the Receiving End

As a human resources consulting professional, I interact constantly with my 280 small-business clients—helping develop employee handbooks, create personnel files, set benefits policies, and provide performance appraisals. In the process, I spend a lot of time fielding phone calls, faxes, and voice mail.

The most odious of these have to be faxes. Although I send only 8 to 10 faxes a week, in that same time I receive at least 20 or 30. The head of a small accounting firm may have a question about a premium statement or contract. Or insurance companies may fax me lengthy articles about changes in national health care, mandated benefits, and other news.

My office is in an old neighborhood with aged phone lines, so many of the conventional faxes I received came out garbled, or the type would be so small it was illegible. I didn't have time to collate the pages of a long fax. And I hated dealing with that slick, curling thermal paper. I always had to keep a good supply on hand, and the stuff would inevitably run out in the middle of a fax. Or a client's staff would send a ten-page fax and one page wouldn't go through, but they didn't know *which* page was missing, so they would have to send everything again.

The busy signal was a dreaded enemy; it always seemed that when I was expecting an important fax from a client, the line would be busy, tied up with some unsolicited "junk" fax. And since I also had a fax machine in my home office, I could be awakened by ringing phones, otherworldly beeps, and slicing sounds late at night.

Finally, there's the price. A dedicated fax line added about $50 per month to my overhead, and the two fax machines I've bought in the past five years cost $700 and $500 each. I used to go through a $4 roll of fax paper a week. All that adds up.

I tried using fax software with my PC's fax-modem, but I wasn't comfortable with leaving my computer on to receive faxes at all times. Besides, it was *still* too difficult to check on my faxes when I was out of the office.

Then one day last summer, a computer-savvy friend who was tired of hearing my complaints suggested a service called FaxWeb that lets you receive faxes and voice mail at the same World Wide Web site. I had never used the Web but was eager for an alternative to the fax monster.

Using the Netscape browser, I connected to NetOffice's FaxWeb site (**http://www.nece.com/faxweb**) and ordered a personal FaxWeb account—a "place" where I can receive voice messages and faxes. Voice mail service is $10 per month, and the fax option costs $15, so FaxWeb's total cost is $25 a month. That's half of what I paid for a dedicated fax line alone.

FaxWeb works by receiving fax and voice messages and forwarding them to a private account number. Incoming voice messages and faxes are encrypted and stored on a FaxWeb server, which I access using a personal log-in and password. (I receive e-mail messages at my separate Internet address.) All my faxes and voice mail messages are listed by date, time, and sender, so it's easy to prioritize messages to listen

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Faxes are encoded in a format called TIFF-F; NetOffice provides a freeware viewer for the format. When I look at a fax on screen, I can see all the important things like signatures and can make out handwritten notes if they're written clearly enough. And it's easy to view faxes when I'm out of the office: I dial in to the Internet from my laptop, log in, and my faxes and voice mail are there waiting for me.

Voice mail messages are a little thornier, since .wav files can take forever to download. Fortunately, FaxWeb posts voice mail messages in both .wav and RealAudio formats. The latter lets me listen to a message while it's being transmitted. If I have to listen to a message again, I can use an on-screen scroller. I downloaded the free RealAudio Player from Progressive Networks' Web site (**http://www.realaudio.com**).

Webbed Feet

Since I'm no early adopter of technology, I was pretty skeptical about all the surf-the-Net hype. But after getting my feet wet with FaxWeb, I've discovered that the World Wide Web is full of important information that I can use in my business. Now I'm able to do market research for my clients and locate information I would never have found before. And I'm always a click away from my faxes and voice mail.

There are two downsides to FaxWeb, though. One is that it's really useful only for those of us who receive far more faxes than we send. If you send faxes frequently, you will still need a fax machine. I've also had to order new business cards with my FaxWeb number printed on them. But hey, since it gets me away from all that curly, expensive paper, I don't mind.

- **FaxWeb** $25 setup fee, $25 per month, $15 per month for fax only; NetOffice, Inc.; 404/249-6500
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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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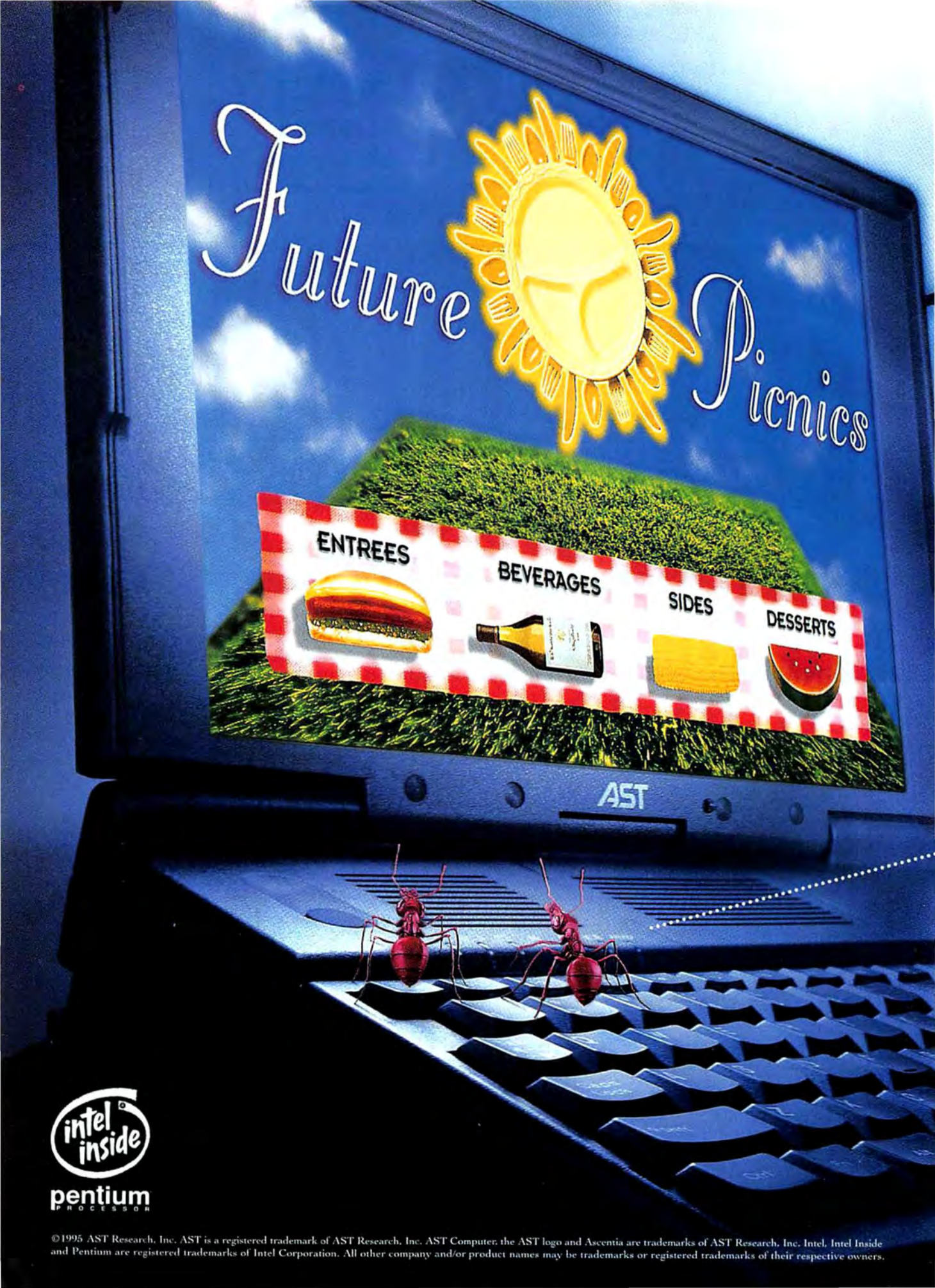

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CPU Button indicates the *minimum* processor required. If a title is available in PC and Macintosh formats, the top half of this button represents PC system requirements and the bottom half represents Macintosh system requirements. Note: Ser.=Series, Class.=Classic, Pent.=Pentium. For Mac – LC series includes LC 475, Performa 475, Quadra, Centris, Powerbook 180C, IIFX or better.

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Historical 5020003

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WIN/MAC	386/25/LCII	4mb	M

Jumpstart First Grade
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WIN/MAC	486/LCIII	4mb	M

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The Unluckiest Man on the Net

ERIK BUTLER

The noise from Net hypemongers and Webhucksters gets louder and louder. Now I'm starting to think I must be the Unluckiest Man on the Net. We are supposed to be entering a bright new age of creativity unseen since the glory days of Athens. And somehow I seem to be the only one missing out on it.

Now I know why. The more you talk to Internet true believers, the more you learn how willing they are to wade through swamps of stupidity, hassle, and outright junk to reach their online nirvanas. I'm not as tolerant or as lucky. My reward has been mostly frustration.

Take choosing an Internet provider. It should be as simple as picking a long-distance service. It isn't. A couple of years ago I managed to stumble upon a hungry local outfit that offered unlimited connect time for ten bucks a month, and discounts for paying in advance. What a deal!

Of course, trying to dial in to the system anytime but the wee hours of the morning got me more busy signals than connect tones. When I did get through, the screen often displayed a message explaining how long the system was likely to be offline tomorrow. Or a frantic notice would sometimes bust in to announce "SYSTEM GOING DOWN IN ONE MINUTE!" In a way it was kind of exciting.

The system died for a full week. All my correspondents were duly informed of my online nonexistence. I demanded my money back. But others were willing to put up with the company's incompetence—right up to the moment it went belly-up. It was by no means the only provider that has disappeared from the scene.

Now please recall that I am the Unluckiest Man on the Net. I signed up for Netcom's Netcruiser service. The company had been around for a while. Its software had been favorably reviewed and was easy to install.

And unlike The Who, I got fooled again. The Netcruiser software is mostly awful, including the lousy Web browser, which you can replace with Netscape. Telnet into the Library of Congress or anywhere else and virtually the only way to capture the information appearing on the screen is to write it down. Incoming messages can be saved, but only under a file name like "00000014.MSG." Draft a piece of electronic mail, and there's no way to save it on your system except under that same sort of file name. It's The Internet *by* Dummies.

Internet true believers are willing to wade through swamps of stupidity, hassle, and outright junk to reach their online nirvanas.

A Good Provider?

Is there a simple solution? Hardly. Choosing an Internet provider still takes careful shopping. For example, to keep costs down, you need a local dial-up number. But if you want Net access while you're on the road, you need a service that has access wherever you're headed—access free of both connection time charges and local tolls.

Price is important, but so are service and stability. Ask other customers in your area how easy it is to dial in at the hours you plan to connect. Then ask again: Fanatical Internet junkies may hook up from work or school on a fast line or simply accept busy signals as part of the glorious experience.

While you're at it, consider demanding your own domain name. If you are joeblow@onthecheap.com, you'll become a nonperson if onthecheap.com goes under and takes your address with it. If you are joeb@joeblow.com, you can pick up shop and move elsewhere.

Unfortunately, many Internet providers can't give you your own domain, many of the ones that can do it charge extra for the privilege, and the Internet's administrators now charge $50 a year for maintaining a domain name. You know what? If it keeps you from missing one piece of important e-mail, it's probably worth it.

And watch out for proprietary solutions. Accessing the World Wide Web from online services may be handy, but that can keep you from picking your own browser and running "helper" programs like RealAudio.

Yet maybe all this hassle keeps the Web temporarily purer than if it were actually simple to use. Once everybody can figure out how to get there, the Web is likely to turn into television. Moneyed media will produce slick, professional products full of the surefire elements that attract audiences. Unless the glory days of Athens somehow return, amateurs are likely to come up with material about as exciting as what you find on public access cable. And I, the Unluckiest Man on the Net, will somehow find software that is stuck on their channel.

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).*

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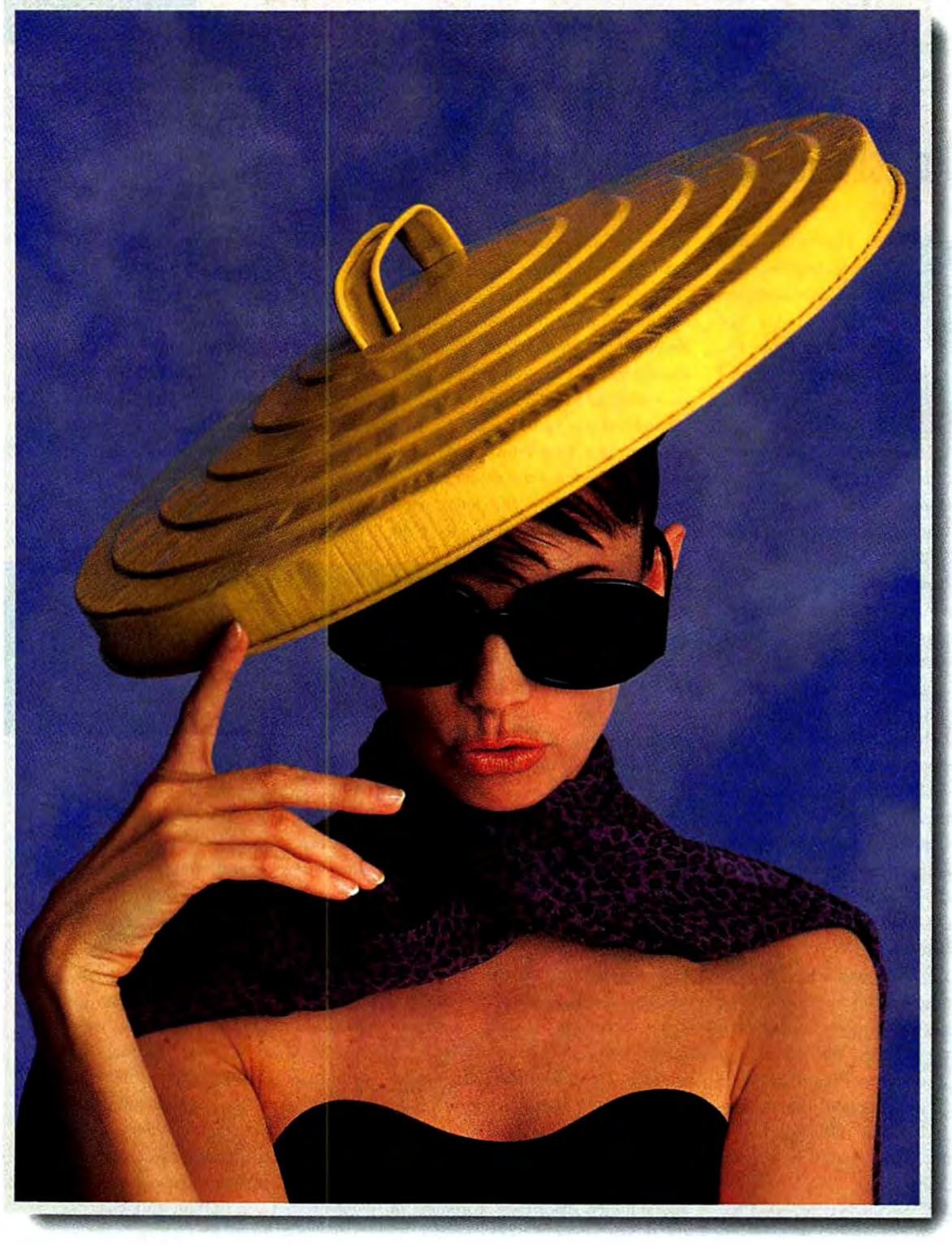

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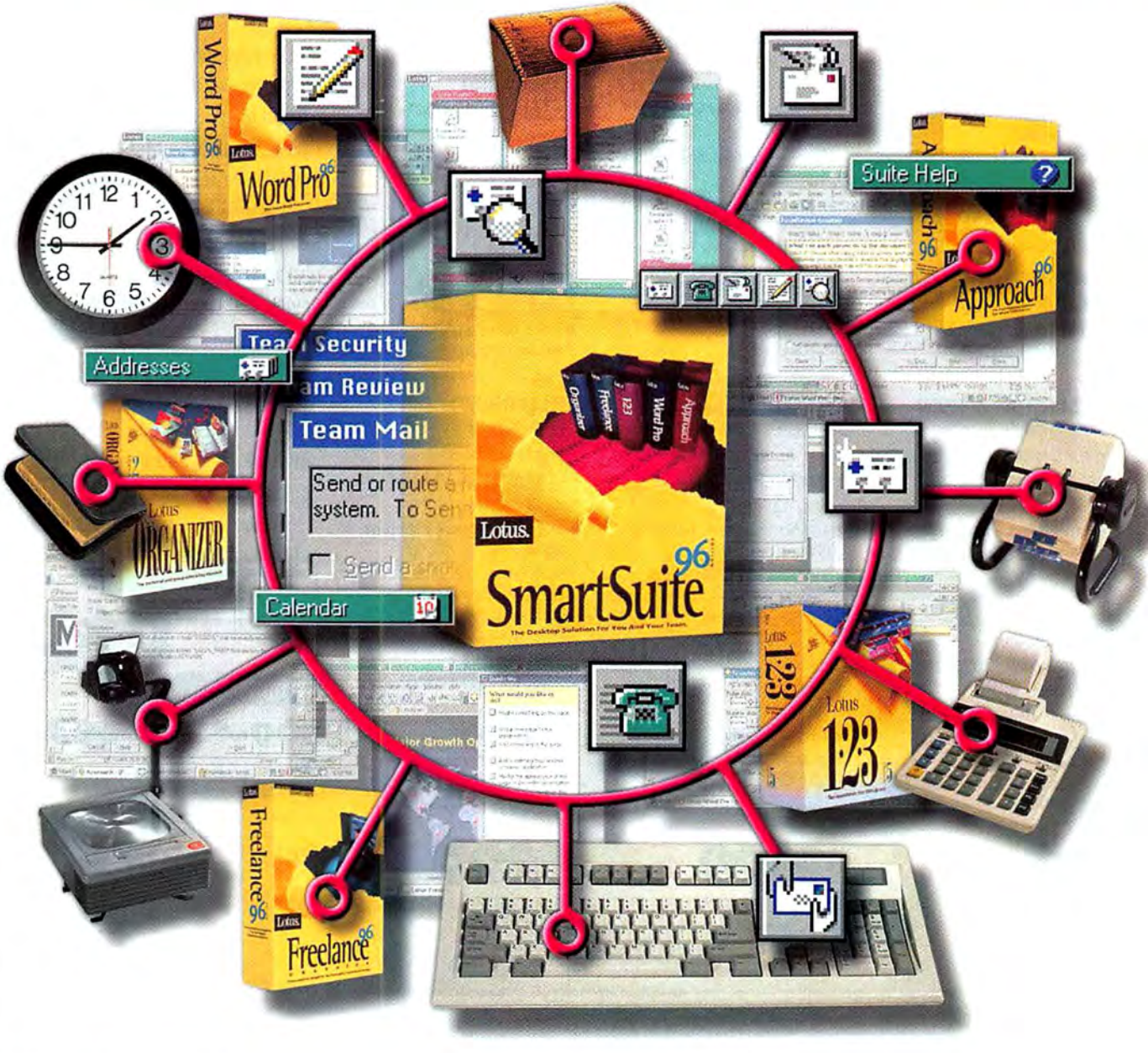
Pricing is not discountable. *The VeriTest Cross-Country v2.0 test simulates typical executive use of Microsoft Office® applications in Microsoft Windows® 3.11 during an airplane flight. Power management was enabled and 8MB RAM was installed. VeriTest, inc. is located in Santa Monica, CA. †For a complete copy of our Guarantees or Limited Warranties, please write Dell USA L.P., 2214 W. Braker Lane, Building 3, Austin, TX 78758. ◊Business leasing arranged by Leasing Group, Inc. *Prices and specifications valid in the U.S. only and subject to change without notice. Microsoft, Windows and the Windows logo are registered trademarks of Microsoft Corporation. The Intel Inside logo and Pentium are registered trademarks and IntelDX4 is a trademark of Intel Corporation. ©1995 Dell Computer Corporation. All rights reserved.

intel inside pentium processor

Designed for Microsoft® Windows®95

Lotus SmartSuite 96

BACK IN THE RING AGAIN



Edited by Andy Reinhardt and Randy Ross

TEST DRIVE

Our initial scouting report for Lotus's SmartSuite 96 for Windows 95 gives it a tentative thumbs-up. Feature for feature, SmartSuite easily matches Office 95. In fact, it sports some unique capabilities that will make it worth an upgrade for many people. We examined a beta version and were particularly taken with Team Computing, a set of features that lets you easily share files and collaborate with coworkers. By contrast, our in-depth December review of Microsoft Office 95 found that the package lacked significant new features and for many users wasn't worth the upgrade.

SmartSuite 96 is slick and feature packed, and it offers great tools for teams of users. Trouble is, it's incomplete.

Moreover, Lotus is a clear winner on price. The $399 SmartSuite 96 includes six applications: the 1-2-3 spreadsheet, Approach database, Freelance Graphics presentations package, Organizer information/calendar manager, ScreenCam screen capture utility, and Word Pro word processor. The $499 standard edition of Office 95 has only four applications: the Excel spreadsheet, PowerPoint presentation package, Schedule+ information/calendar manager, and Word word processor. The Professional edition of Office 95, which adds the Access database, costs a hefty $599.

That's the Good News

So why are we tentative? First, the SmartSuite roster is incomplete. New Windows 95 versions of Word Pro, Freelance, and Approach share the lineup with old Windows 3.1 versions of 1-2-3, Organizer, and ScreenCam. Although you can still share information among all the applications, 1-2-3 and Organizer can't use long file names and have a different interface and menu structure than the other applications. Early versions of 1-2-3 for Windows 95 trickled out to key customers in October, and beta testing is expected to continue at least until January. Likewise, Organizer is expected to surface in late January, with shipment expected midyear. SmartSuite 96 includes coupons for free upgrades as the products become available for Windows 95.

Uncertainty also persists about SmartSuite's future. New Dataquest estimates show Microsoft with a staggering 90 percent of the Windows suite market, leaving SmartSuite and Novell's PerfectOffice to divide the scraps. If there isn't much market, why should Lotus parent IBM stay in it?

On the other hand, Novell's abrupt departure from the applications business could make IBM less likely to follow suit and forfeit the entire suite market to Microsoft. (For more on the PerfectOffice sale, see *Breaking News*.)

Finally, there's the untested factor of performance. In the December issue we reported mixed results with Microsoft Office 95. On certain tests Office 95 offered little or no speed improvement over its Windows 3.*x* counterpart, especially in the creation of compound documents. PowerPoint was particularly slow. At press time SmartSuite 96 was in beta, so we couldn't test it for speed. But some preliminary results using the final beta of Word Pro show that it runs very slowly on a 486, though adequately on a Pentium. (We examined SmartSuite on a Pentium-75 with 16MB of RAM.) Stay tuned for more performance results.

Despite holes in the lineup and some lingering questions, SmartSuite 96 has better features than its Windows 3.*x* predecessor—even if you don't need the workgroup capabilities. And if you work in a team, it will be a strong rival to Office 95.

Both SmartSuite 96 and Office 95 have

Breaking News

PERFECTOFFICE FOR SALE: Novell is selling its PerfectOffice suite, comprising WordPerfect, Quattro Pro, Presentations, InfoCentral, and Envoy. (The professional edition also bundles Borland's Paradox and a GroupWise client, which are not up for sale.) The company expects to wrap up the sale by the end of January. Novell can't comment on potential buyers, but possible candidates include Oracle, Computer Associates, and Apple Computer, says Jeff Silverstein, editor of the *Software Industry Bulletin*. But he notes that any company planning to compete against Microsoft's Office 95 faces a daunting task. The buyer is expected to maintain support for the products. The sale does not affect Novell GroupWise (a groupware package of e-mail, scheduling, and workgroup collaboration tools) or Novell's home packages such as PerfectWorks, which are handled by different groups in the company. —L. M.

INTEL FOES TEAM UP: AMD plans to acquire NexGen in the first quarter of 1996. The combined companies, both of which lag behind Intel and Cyrix in Pentium-class chips, could make a stronger competitor in an accelerating market. AMD says it will kill off its own "K6" chip—originally intended as a rival to the Pentium Pro—and instead speed up work on NexGen's Nx686 design. This chip, which AMD will rechristen K6, should outperform

(continued on page 43)

LEFT: JEFF BERLIN; ABOVE: JEFFREY PELO

improved integration among their components, especially when dealing with multiple applications simultaneously. In Office 95, the Binder lets you store documents created in different apps in a single file, making it easy to access and share these documents with other users. SmartSuite 96 offers Divisions, a kludgy but useful counterpart that resides in Word Pro.

Here's how it works: You attach a file, such as a 1-2-3 worksheet or a bit-map image, to a Word Pro document. When you click a tab in the document, the file and its originating application are launched. Unlike the Binder, which accepts only files created with Office-compatible applications, Word Pro accepts files created by any Windows 3.1 and Windows 95 OLE applications. However, since these files are simply linked, not bound into the Word Pro document, exchanging with coworkers is clumsy: You have to remember to send the file and all the linked documents.

Another significant SmartSuite feature is the SmartCenter, a file and program launcher that uses a file cabinet metaphor to help you organize and access data from a single location. This tool blows away Office's competing feature, the Shortcut Bar. The SmartCenter consists of four separate "drawers" in which you store programs, documents, SmartMasters, and even Notes applications. You can create folders within each drawer to store related information, such as all files related to a specific project.

SmartSuite Versus Office: The Highlights

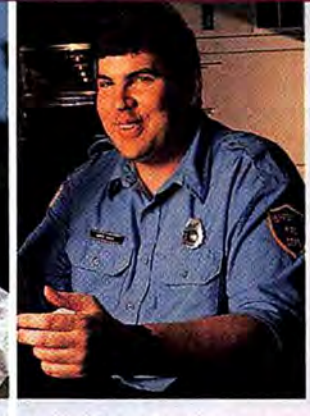
	SmartSuite 96	Office 95 Professional
The lineup		
Components	Windows 95 versions of Word Pro, Freelance Graphics, Approach; Win 3.1 versions of 1-2-3, Organizer, ScreenCam	Windows 95 versions of Word, Excel, PowerPoint, Schedule+, Access
List price	$399	$599
Maximum disk space required	140MB (estimate)	149MB
Integration features		
File/application launcher	SmartCenter: Accesses programs, documents, Organizer data	Shortcut Bar: Accesses programs, documents
Cross-application	Word Pro Divisions: Links documents to Word Pro documents; kludgy support for any Windows 3.1 or 95 OLE application	Binder: Stores multiple documents in a single file; supports only files created by Office-compatible applications
Workgroup features		
E-mail	TeamMail: Routes files and pieces of files; supports cc:Mail and MS Mail	Send Mail: Routes entire files only; supports MS Mail and cc:Mail
Revision tracking	TeamReview: Tracks revisions in Word Pro and Freelance; sets access rights	Revisions: Available only in Word; sets read/write access rights only

Microsoft Office 95 Face-Off Lotus SmartSuite 96

Name: John Gilbert
Job: Information systems manager for Eagle Creek, a travel gear manufacturer in San Marcos, California
Why choose Office 95? "The individual apps and the stability," Gilbert says. "Word and Excel are the driving factors," he adds. He thinks Microsoft Word is easy for users and offers excellent Help features.

Crash resistance is also critical. "The accounting department uses the most god-awful-size spreadsheets," he says, which were making the PCs crash. "You had to close everything but the spreadsheet. Word used to die on me on a regular basis with a big document....With Office 95, I can open up as many spreadsheets as I want and keep the other applications open.

"Also, the Binder feature is intriguing for putting together large documents," he says.



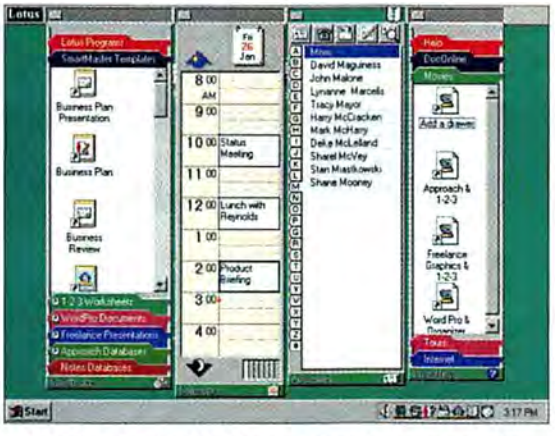
Name: Michael Haas
Job: Systems operator for the Upper Peninsula Emergency Medical Services in Marquette, Michigan
Why choose SmartSuite 96? "1-2-3 has always been our spreadsheet," Haas says. "We are familiar with Lotus, so we don't have to learn as much. Number two, I've never had a problem getting support from Lotus." In addition, the new versions of Word Pro and Freelance Graphics look strong, and the workgroup-oriented features should save time, says Haas. "We've been trying TeamReview [a group editing feature], and it's a lot better than leaving a note on a piece of paper." Haas and his colleagues used to edit by marking up paper copies of a document, then asking the person who wrote the document to incorporate all the changes.

—Laurianne McLaughlin

LEFT: ANN SUMMA; RIGHT: STEVE WOIT

SmartCenter also provides access to your Lotus Organizer calendar and address book. You can view and add items directly from the SmartCenter without having to open Organizer first. A similar feature in Office's Shortcut Bar provides a set of icons that merely launches Schedule+ and opens to the correct part of the program.

SmartSuite 96 has a similar look and feel across Word Pro, Freelance, and Approach; it also features more shared components than its predecessor, including the file dialog boxes and SmartIcons. The innovative InfoBox, a single dialog box for a number of commands and features, has been implemented across the suite. Also new is LotusScript, an object-oriented programming language, available in Word Pro, Approach, and Freelance (now the only presentation package with such a feature), and in the upcoming 1-2-3 for Windows 95. For in-house developers, this represents a big advantage over Office 95, which currently offers its Visual Basic for Applications language only in Excel and Access.



SMARTCENTER provides instant access to programs, files, and Organizer's calendar and phone book.

Suite Teamwork

SmartSuite's Team Computing features make it easy for members of your team to work together. The most notable features are TeamReview, TeamMail, and TeamSecurity. TeamReview, which you'll find in Word Pro, Freelance, and the next 1-2-3, lets you send a document to coworkers for review, assign editing rights to each of them, and combine each person's comments into a master document. The TeamMail feature, available in all the applications (including the upcoming 1-2-3), lets you send an entire file or selected pages in sequence to others for review. TeamSecurity, available in Word Pro, Approach, and Organizer, lets you assign both group- and individual-access rights to a file. For example, you can allow some people to read the file, some to edit it, and some to save it—and restrict everyone else's access.

Word Pro 96 emphasizes Team Computing. For instance, the TeamConsolidate capability greatly simplifies managing document revisions. Although Word 95 also has revision tools, using them can be tedious. You must merge each file individually, and you have to switch to the Revisions dialog box to review each editor's changes.

Word Pro's tabbed interface makes it easy to create and organize long documents. SmartMasters templates are improved, offering a number of professionally designed formats, such as newsletters, a marketing plan, and a sales proposal. You can also open and save files directly from World Wide Web sites and Internet FTP servers, as well as create your own Web pages by saving files in HTML format.

SmartSuite 96 for Windows 95

Key Features: Low price • Unique collaboration tools for group editing • Best set of suite integration features we've seen • Cross-application programming language
Availability: Immediate
Pricing: $399, upgrade $199
Lotus Development Corp., 800/343-5414
Reader service no. 798

JEFFREY PELO

Breaking News

(continued from page 41)

the Pentium Pro, running up to 100 percent faster on 16-bit code and 33 percent faster on 32-bit code, AMD claims. The first K6 systems should ship in the third quarter of 1996. "If they deliver on their promises, these could really be killer Windows 95 machines," says Linley Gwennap, editor in chief of the *Microprocessor Report*. The new K6 will fit into standard motherboards and work with regular chip sets, unlike previous NexGen chips, so it's likely to show up in more systems, he adds. —L. M.

AOL DELIVERS THE INTERNET: America Online is plunging into the Internet-access business with GNN, a new all-Internet service. For $14.95 a month, users get 20 hours of Net access (it's $1.95 an hour after that), a suite of high-quality Internet tools (a previous incarnation of its Web browser won a *PC World* Best Buy last year), Web publishing tools, 20MB of storage space on AOL's Web server, and customer service covering the whole shebang. By default, the GNN browser will land on the GNN Web site (http://www.gnn.com), which AOL is populating with original content (covering books, travel, food, parenting, and more), a decent search engine (AOL's own WebCrawler), news (from the ubiquitous Reuters NewMedia), and links to the Yahoo Web directory. AOL says it is aiming GNN at users who find a sim-

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Do It Graphically

As with Word Pro, the most significant improvements to Freelance Graphics come in the area of team computing. The TeamReview feature, for example, lets you distribute a presentation to associates for review, either on a floppy disk or via e-mail. You can then annotate the slides using a set of mark-up tools, including circles, arrows, and color-coded sticky notes. The TeamShow feature lets you present a screen show without actually being there: Using the remote access features in Windows 95, you can connect to another PC through the network, a direct cable connection, or a modem and then launch the presentation. The persons on the other end, who must be equipped with Freelance or the TeamShow application, can see the presentation and follow along with you.

Freelance 96 is also easier to use. It has a set of canned presentations based on the work of various marketing gurus, and it offers a more versatile selection of templates than PowerPoint. It also includes eight ready-made multimedia SmartMasters with built in animation and screen show effects, though these aren't as entertaining or as easy to use as PowerPoint's equivalents.

More Approachable Database

When Approach first appeared, its ease of use made it an instant hit. Approach 96 retains the simplified interface but adds programmability and functionality, moving into the same league as Access and Paradox.

Approach 96 maintains support for dBASE, Paradox, and SQL data while adding support for direct access to Notes

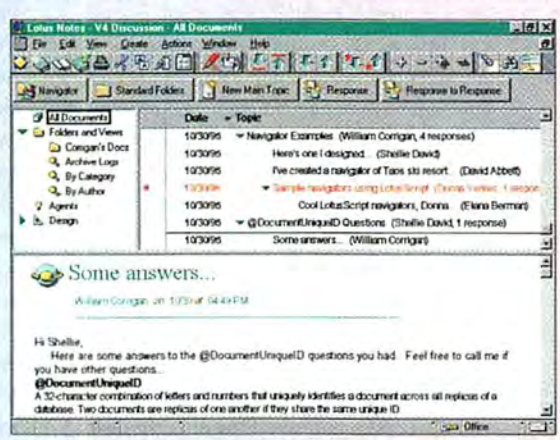
Notes 4.0 Preview | Team Computing for the Big Leagues

SmartSuite 96's most distinguishing characteristics are its novel workgroup capabilities. If this team focus piques your interest, you should consider another significant upgrade from Lotus: Notes Release 4.0. This premier groupware product, a collection of high-powered communications and collaboration tools, incorporates many of the interface improvements found in the new SmartSuite. Other new features enhance Notes' programmability, as well as its integration with SmartSuite 96. We got a sneak preview of the product and were impressed by its power and ease of use. Still, we'll reserve final judgment until we see the shipping version, slated for delivery early in 1996.

Facing a Familiar Interface

As in SmartSuite, Notes 4.0's menus and SmartIcons are now context sensitive, so you see only the menu commands and icons that apply to your current task. The initial menu bar is now standard among Lotus products, and Notes also has the InfoBox—a multipanel window for controlling property settings—that is featured in new SmartSuite products.

Some improvements are specific to Notes. When you open a Notes database, you see View, Preview, and Navigation panes. (Previous versions offered only a single pane.) The View pane is similar to a Notes 3 view with added capabilities. The Preview pane displays the selected document, and the Navigation pane displays the available views and folders.



NOTES 4.0'S NEW THREE-PANE SCREEN is more intuitive than the interface on the preceding version.

Agents and Database Tools

Notes 4.0 also introduces *agents*—instructions that nonprogrammers can create to automate tasks without getting into tricky macros. For example, you can create agents to change a field value or send a reply. A visual tool for creating agents—the Agent Builder—should encourage tentative users and be easy for the more technically inclined. Notes 4.0's improved database design tools continue to enhance integration with SmartSuite and other software products. Using LotusScript and Notes FX 2.0 (an improved technology for data exchange), developers can create database applications that share both information and functionality between Notes and compatible products, such as SmartSuite 96.

Remotely Speaking

Providing support for remote users has always been a Notes strength. New configuration features simplify this process and let you connect from home, hotel, or anywhere else. Notes will automatically set up the appropriate ports and dial-up settings. Once you're connected, replicating (that is, synchronizing) changes between local and server copies of databases is easier as well. The Replicator feature lets you determine visually which data should be sent and/or received. Notes 4.0 is expected to list for $275 per user in quantities of 50 or more. Lotus Development Corp.; 800/346-1305. Reader service no. 799

—Christie Williams

THE INFOBOX, common to all SmartSuite apps, makes it easy to find commands and actions for the current task.

databases. Notes users won't find a similar capability in Access or Paradox. New SmartMasters provide ready-made databases, complete with input forms, reports, relational tables, and the like. The new Find Assistant guides you through the process of defining complex search criteria. For beginning database users, this feature is much easier to use than the complex query tools found in Access and Paradox.

But the biggest change to Approach 96 is the addition of LotusScript, the new cross-application programming language. The LotusScript Program Editor enables database developers to produce automated systems. However, the nonprogramming masses of the Approach 96 audience will be pleased to hear they can still create and run the less-intimidating Approach macros.

Old 1-2-3 and Organizer

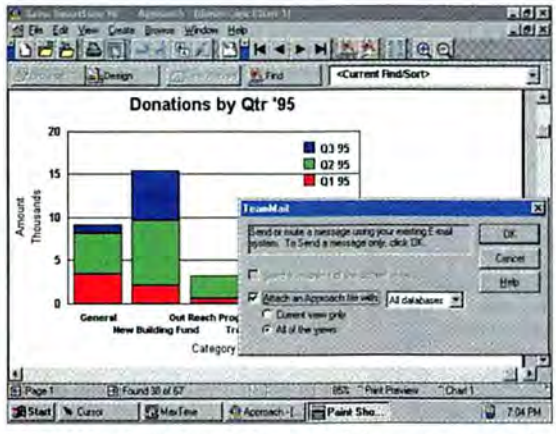
The version of 1-2-3 included in SmartSuite 96 is unchanged from the previous SmartSuite, but Lotus says there will be key improvements once the spreadsheet is upgraded in 1996. The biggest changes here will again be in the Team Computing category. The Team-Consolidate feature will let you easily combine multiple versions of a spreadsheet in one file. You'll also find a collapsible Outliner module, and you'll be able to annotate individual cells with comments. The new version of Organizer was under wraps at press time, and Lotus wasn't talking. But seeing that its predecessor garnered a Best Buy in our personal information manager review (see "Software for the Perpetually Overworked"), we expect great things from the Windows 95 version.

Meanwhile, ScreenCam 2.1 has been upgraded to allow you to record Windows 95 applications, but Lotus would not discuss any plans for a Windows 95 product.

Performance Will Be Key

Despite the lack of Windows 95 versions of 1-2-3, Organizer, and ScreenCam, SmartSuite 96 looks promising. Its new features are impressive, and if performance is acceptable in the shipping product, current SmartSuite users will want to consider upgrading. The same holds true if you haven't decided between Office and SmartSuite and you're looking for the best workgroup features. But if you rely heavily on 1-2-3 or Organizer, you're better off waiting for Windows 95 versions to minimize upgrade headaches. Finally, if you're wondering if SmartSuite 96 alone justifies upgrading to Windows 95, you may want to hold off until this Suite is complete.

—Cathy Kenny; additional reporting by Celeste Robinson and Laurianne McLaughlin



TEAMMAIL, shown here in Approach, lets you send a chart or a report to colleagues via e-mail.

JEFFREY PELO

Breaking News

(continued from page 43)

ple online service (like AOL itself) too limited but who still want some handholding as they venture out into the wild and woolly Internet and World Wide Web. —D. M.

MPEG FOR THE MASSES: In a move that could lead to lower-cost full-motion video boards, Sigma Designs will make its new Realmagic Pro MPEG chip set available to other graphics board vendors. This is the first time Sigma Designs, arguably the pioneer of MPEG digital video on the PC, has made its chips widely available. Boards built on the chips should sell for less than $200 and be a snap to install: Not only is the Realmagic Pro chip set Plug and Play compatible, its overlay technology also lets users easily link the MPEG card to their graphics board through an external cable connection. Sigma Designs' own Realmagic Pro card is scheduled to ship to end users this quarter. —B. G.

TOO HOT TO HANDLE: Dell Computer has recalled one of its 14-inch monitors, the Model DL-1460NI, because of a possible fire hazard. If you own one of these monitors, contact Dell at 800/913-3355 between 8 a.m. and 5 p.m. central standard time, Monday through Friday. Dell says it will pick up the monitor, repair it free of charge, and return it to you within three to five working days. —G. M.

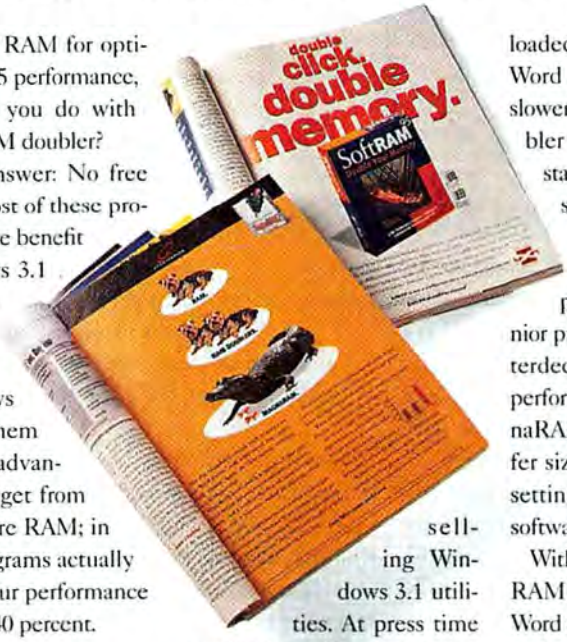
Edited by Randy Ross

RAM Doublers No Substitute for Real RAM

TEST DRIVE The claims sound like a get-rich-quick scheme: Buy our software and turn your 4MB weakling into an 8MB contender or your 8MB yawner into a 16MB screamer! Promises one advertisement: "Instantly speed up Windows 95 and Windows 3.0 and higher." But can a $50 software package really provide the same benefits as $200 or $400 worth of real RAM? Does it boost performance and let you load more applications?

Our mission was to discover if RAM doubling software really works. For Windows 3.1, we tested whether RAM doublers let you open more applications in the same amount of memory. For Windows 95, our goal was different: Given that Microsoft recommends 8MB of RAM to run Windows 95, can you get by with only 4MB and a RAM doubler? And since our previous tests show that you need 16MB of RAM for optimal Windows 95 performance, how well will you do with 8MB and a RAM doubler?

The short answer: No free lunch here. Most of these programs offer more benefit under Windows 3.1 than they do under Windows 95. But under Windows 95, none of them provides the advantages that you get from popping in more RAM; in fact, these programs actually slowed down our performance by as much as 40 percent.



More Apps for a Small Price

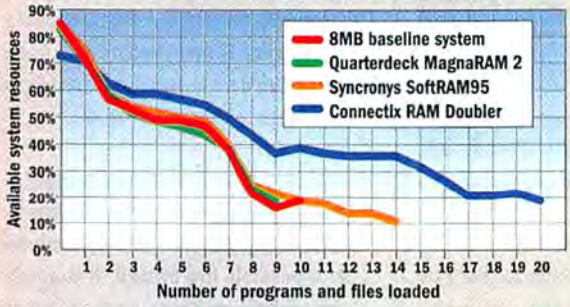
We looked at three programs: RAM Doubler from Connectix, MagnaRAM 2 from Quarterdeck, and SoftRAM95 from Syncronys Software. RAM Doubler, the most seasoned of the bunch, is one of the best-selling Windows 3.1 utilities. At press time no Windows 95 version was available, although Connectix has disclosed plans to release one soon. Both MagnaRAM 2 and SoftRAM95 ship in boxes that include versions for both Windows 3.1 and Windows 95. (As we went to press, Syncronys Software announced it would relabel its box to say that SoftRAM95 is meant for use only with Windows 3.1.)

Under Windows 3.1, an 8MB PC with no RAM doubling software installed could load ten programs before it ran out of system resources (see chart at left). With RAM Doubler, we could load ten additional apps or files; SoftRAM95 let us load only four additional apps. With MagnaRAM 2, the system ran out of capacity with one less program loaded than our baseline 8MB model had.

Unfortunately, all three Win 3.1 RAM doublers slowed the performance of a Word macro running alone by roughly 2 to 6 percent. With five applications loaded in the background, the Word test ran about 5 percent slower when either RAM Doubler or SoftRAM95 was installed than it did on a plain system; MagnaRAM 2 dragged performance down by more than 50 percent. (Ian Gold, a senior product manager for Quarterdeck, says you can improve performance by tweaking MagnaRAM 2's threshold and buffer sizes, but we chose to use settings recommended by the software during installation.)

With 14 apps in memory and RAM Doubler running, the Word test took more than twice as long to complete as it did with no other apps loaded. SoftRAM95 fared a bit better under the same circumstances: The Word test took merely 73 percent longer to run. Of course, without the RAM dou-

Some Let You Run More Apps in Windows 3.1



Methodology All tests ran on a Compaq Deskpro 4/66i with a 486DX2-66 CPU, 8MB of RAM, no secondary cache, a 500MB IDE hard drive, Windows 3.11, and a 20MB permanent swap file. We ran a Word macro on Word 6.0c with no other applications loaded in the background and then loaded Excel 5.0c, Freelance Graphics 1.0 for Windows, Windows File Manager, Paradox 3.5 for DOS, AfterDark 3.01 for Windows, Sidekick 2.0 for Windows, Powerpoint 4.0c, Dashboard 3.00 for Windows, Laplink 6.00 for Windows, three Windows 3.1 applets (Paintbrush, Terminal, and Notepad), and MS Test 1.0. We defragmented the hard drive and rebooted between trials.

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

MagnaRAM 2

Pricing: $40
Quarterdeck,
800/683-6696,
813/443-1331
Reader service no. 796

RAM Doubler

Pricing: $55
Connectix,
800/950-5880,
415/571-5100
Reader service no. 795

SoftRAM95

Pricing: $40
Syncronys Software,
800/691-7981,
310/842-9203
Reader service no. 797

JOHN GREENLEIGH

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blers, we couldn't load nearly this many apps, so you may regard the speed penalty as an acceptable price for being able to juggle more work.

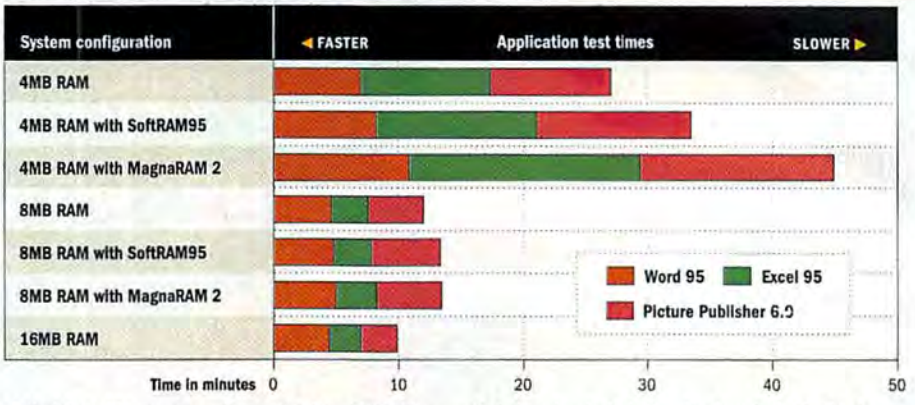
Chips Beat Bits

With Windows 3.1, even if you had plenty of physical memory, you might not be able to open more than a few apps—hence the appeal of a RAM doubler. Windows 95 largely eliminates this constraint. It also juggles apps well: We've seen little speed degradation even with six or seven programs loaded into 16MB Win 95 systems.

So the only reason to use a RAM doubler with Windows 95 is to increase memory capacity—and, presumably, performance. To see if MagnaRAM 2 and SoftRAM95 meet this challenge, we tested a 486-DX2-66 configured with 4MB, 8MB, and 16MB of RAM running macros for Word 95, Excel 95, and Picture Publisher 6.0. We compared these results against 4MB and 8MB systems "doubled" (theoretically to 8MB and 16MB) with the two Win 95 RAM boosters.

TEST REPORT

RAM Doublers for Windows 95 Slow You Down



Methodology All tests ran on a Compaq DeskPro 4/66i with a 486DX2-66 CPU, no secondary cache, a Qvision graphics processor with 1MB of DRAM, and a 340MB IDE hard drive.

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

Yikes! The 4MB system with either RAM doubler installed not only didn't perform like a system with 8MB of real RAM, it fared considerably worse than it did with no RAM doubler installed—running up to 40 percent slower in our tests (see chart above). The same was true for 8MB systems, though the slowdowns were not as marked: The performance hit compared to a plain 8MB system was 10 percent for SoftRAM95 and 11 percent for MagnaRAM 2. And none of these figures approached the results we saw on a true 16MB PC, which ran our test suite 21 percent faster than did an 8MB system.

Both packages work by compressing data in RAM, which ought to postpone the point at which your PC needs to swap data to slower virtual memory on the hard drive. Quarterdeck and Syncronys contend that their programs' performance-enhancing features kick in when your PC approaches the limits of its physical RAM, but additional tests we performed did not affirm this claim. In any case, users may find it unacceptable to take a performance hit during all the periods their systems aren't fully loaded.

Windows 95 users should skip RAM doublers and save their money to buy real RAM.

—Reid Goldsborough

The Web Browser: Free Information for Investors

Sure, the Web is full of investment information. Big surprise. But did you know that much of it is free? Start with the clearinghouse of pointers at InvestorWeb, a site that links to practically everything, including a number of investment newsletters and a dozen foreign markets. http://www.investorweb.com/...Anyone with a 401(k) can appreciate Mutual Funds Magazine Online. The editorial content is essentially copied from the print version, but the gem here is the unique index of current funds. http://www.mfmag.com/databse.htm...Futures investors should try out the Futures & Options Trading Group. You get access to a database of closing prices for all U.S. exchanges as well as information on how to invest in futures and options. http://www.teleport.com/~futures/...Okay, sometimes you just want a good stock quote. Try the Security APL Quote Server at http://www.secapl.com/cgi-bin/qs. What wasn't ready when this column went to press: a moving stock ticker made possible by Sun's applet-based Java language. When you read this, feed java, stock into a search engine and see if the brew is ready. —Richard Overton

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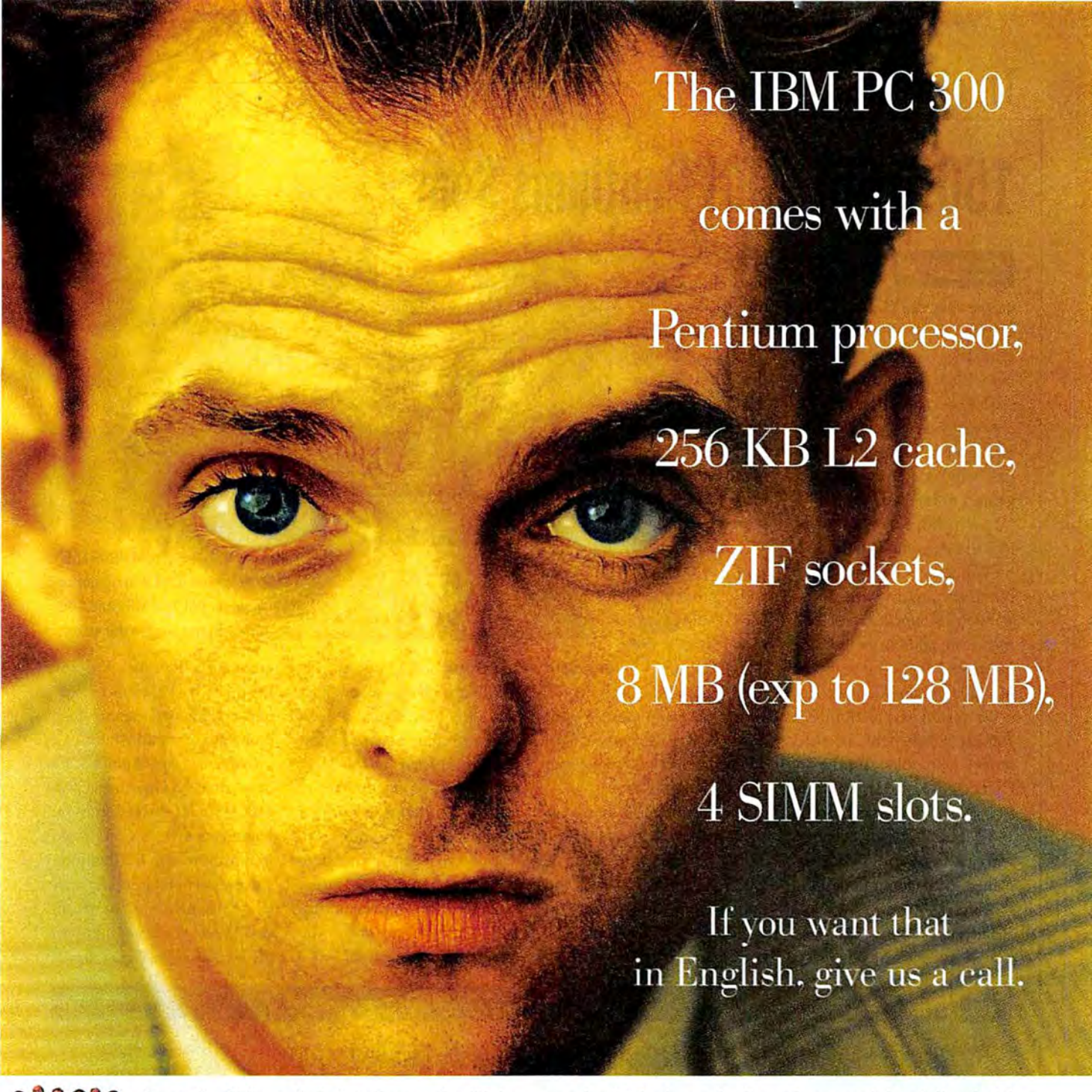

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150! 166! 200! Pentiums Soar

DELL'S PENTIUM PRO–150 PC offers solid Win 95 performance. But 166-MHz and 200-MHz systems wait in the wings.

TEST DRIVE For people who insist on the fastest PC, likely contenders are proliferating like candidates in a Republican primary. Not only has Intel's sixth-generation Pentium Pro entered the race, encroaching on the Pentium itself, but Cyrix's dark horse, the 6x86, poses a threat to Intel's dynasty.

Last month our tests showed that the Pentium Pro runs 32-bit Windows NT software well but does poorly with 16-bit Windows 3.1 applications. This month we address the burning question, What's the best type of system to run Windows 95?

We tested six platforms: a 100-MHz 6x86 demonstration model assembled for us by Cyrix, a 133-MHz Pentium PC, several prototype 150- and 166-MHz Pentium systems, and two new Pentium Pro machines. Prices for most of these PCs aren't yet known.

The Pentium-150s and -166s (slated for release in January) ran neck and neck with the Pentium-133 and the 6x86 on Microsoft Word and Excel tests, but the 6x86 outran the Pentiums in Picture Publisher.

The cliff-hanger involved the Pentium Pros, represented by the 150-MHz Dell Dimension XPS Pro 150 and a prototype 200-MHz Dell system set to ship in early 1996. The Pentium Pro processor tears through 32-bit code, which makes up most of Windows 95. But the parts of Win 95 made of 16-bit code can choke a Pentium Pro.

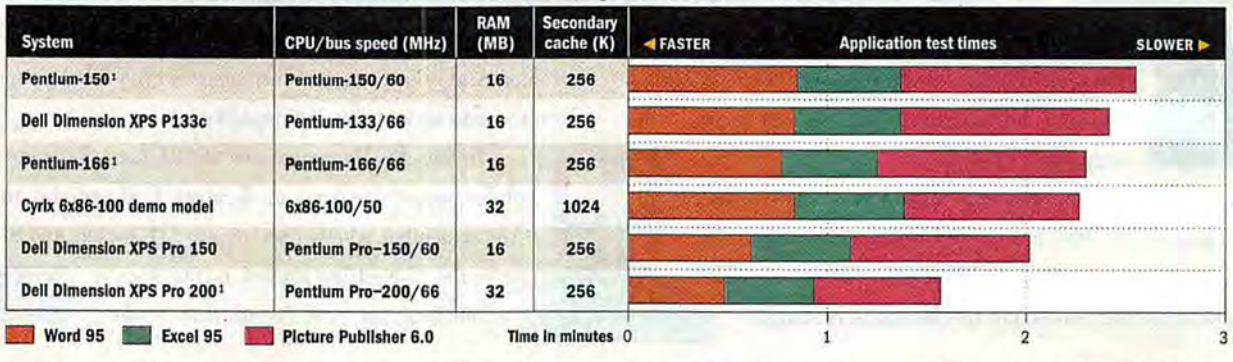
The verdict? In terms of sheer speed, the Pentium Pro's 32-bit prowess won the day. Dell's XPS Pro 150 beat the Pentium-166s and the 6x86 in Windows 95 application tests, bettering their performance by 13 percent and 12 percent, respectively. Of course, the 200-MHz Pentium Pro did even better, running almost 28 percent faster than its 150-MHz counterpart on our full set of tests. But in terms of bang for the buck, the Pentium Pro won't be your chip of choice for Windows 95 in the near future because systems based on this CPU command top dollar. You can expect to pay around $1000 more for a Pentium Pro–150 PC than for a Pentium-150 system, and the performance edge probably isn't worthwhile.

Instead, your Windows 95 dream machine may be a Cyrix 6x86 or a 166-MHz Pentium. One major system vendor told us it plans to skip the Pentium-150 entirely and jump directly to Pentium-166 systems in early 1996, while another predicted its 166-MHz model

TEST REPORT

For Windows 95, Pentium Pros Are Fastest, but They're Not the Best Deal

System	CPU/bus speed (MHz)	RAM (MB)	Secondary cache (K)
Pentium-150[1]	Pentium-150/60	16	256
Dell Dimension XPS P133c	Pentium-133/66	16	256
Pentium-166[1]	Pentium-166/66	16	256
Cyrix 6x86-100 demo model	6x86-100/50	32	1024
Dell Dimension XPS Pro 150	Pentium Pro–150/60	16	256
Dell Dimension XPS Pro 200[1]	Pentium Pro–200/66	32	256



[1] Prototype system(s).

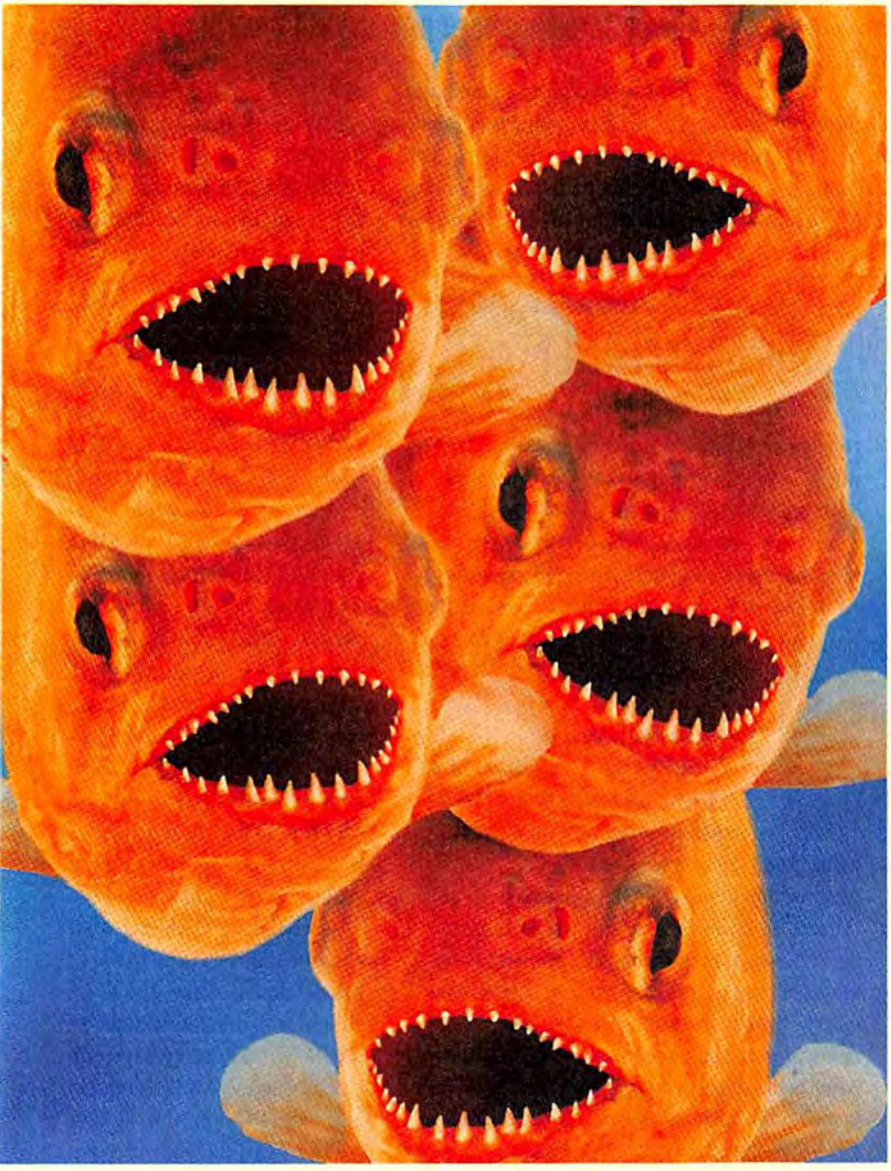
Methodology We used the vendor-configured version of Windows 95. All test applications used the default installation. For descriptions of the Word, Excel, and Picture Publisher tests, see "Is Windows 95 Faster?...Take 2," Top of the News, November 1995.

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

JOHN GREENLEIGH

The Amazonian piranha uses razor-sharp teeth to rip out bloody chunks of your quivering flesh until you thrash and convulse in mind-numbing agony and plead for someone to kill you.

[Sort of like using someone else's network fax solution.]



Everyone knows that network faxing is an amazingly convenient way for people to fax right from their PCs. So there's no more schlepping to the fax machine. Everyone also knows it's agonizingly painful to implement. But now there's Delrina WinFax™ PRO for Networks 4.1. It does for network faxing what Delrina WinFax PRO did for PC faxing — finally make it easy. Installing it takes no time. It's simple to add users and modems. Sending a fax from any Windows application is as easy as printing a document. And since people share phone lines and modems, you save money. See your dealer or call us at 1-800-776-8617 for more information about WinFax PRO for Networks. And go ahead and jump right in to network faxing. The water's fine.

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Circle 37 on reader service card

would be the "sweet spot" for Windows 95 and a hot seller in 1996 and beyond.

The Bus Falls Behind

The promise of Pentium-166 systems derives from the interaction between the CPU and its bus—the electronic conduit that connects the CPU to system memory and other resources. As CPU speed grows by leaps and bounds, the bus still tops out at either 60 or 66 MHz, even in today's fastest PCs. In Pentium-133 systems, for instance, the CPU runs at twice the speed of its 66-MHz bus, whereas Pentium-150s have a 60-MHz bus and the chip runs at two and a half times that speed.

The Pentium-166 not only runs nearly 11 percent faster than the 150 but also has a faster, 66-MHz bus. Does this advantage foretell a short life span for the Pentium-150? One clue supporting this prospect: Intel and major system vendors are already phasing out their 90-MHz and 120-MHz Pentium lines—the only other ones that run on the slower 60-MHz bus.

The issue of bus speed also affects Pentium Pro PCs, but not as much, thanks to the chip's built-in 256K secondary cache. In regular Pentium systems, the secondary cache is external and supplies data to the CPU at bus speed—that is, 60 or 66 MHz. In Pentium Pro systems, the on-chip secondary cache runs at the full CPU speed of 150 MHz and beyond, so the performance penalty for using the bus occurs only when the CPU needs data not resident in the secondary cache and must access the bus to reach main memory.

You can expect to pay around $1000 more for a Pentium Pro-150 PC than for a Pentium-150, and the performance edge probably isn't worthwhile.

The Cyrix Challenge

In light of this bus bottleneck, the Cyrix 6x86 looks even more promising: The 100-MHz chip soared, even on a 50-MHz bus. True, the system we tested had a 1MB cache and 32MB of memory, giving it an advantage over the Pentiums, which had only 256K of cache and 16MB of RAM. Cyrix says this rich configuration merely simulates the expected performance of real 6x86 PCs, which will have features like EDO RAM not used in the demo system.

Bill Blagdan, Cyrix's marketing director, says that PCs with 120-MHz 6x86s and 60-MHz buses will arrive in the first quarter of 1996, while 133-MHz models with 66-MHz buses will hit market midyear. The latter should provide especially stiff competition for the 166-MHz Pentium.

Of course, no one now can compete with Intel's manufacturing capacity—even IBM, which is manufacturing the 6x86 for Cyrix in exchange for rights to make the same chip under the IBM logo.

Nevertheless, with increased competition in chips pushing prices down, soon you'll be able to stop dreaming about an ideal Windows 95 system. Check out 166-MHz Pentiums and 6x86 PCs running at 120-MHz or faster. And keep an eye on Pentium Pro systems: If prices tumble, their strong performance could be worth paying a little extra for.

—Eric Knorr

JEFFREY PELO

Bug Watch Windows 95 Network Insecurity

► **Bug:** Holes in Windows 95's file and printer sharing security can leave your hard disk open to network snoops. The security breach can occur in two situations. If your PC is connected to a NetWare network and a LAN administrator accesses your system using remote administration or Microsoft Remote Registry Services, other network users will be able to read your files (but not write to them) until you reboot. The second risk occurs if your computer is connected to a Microsoft network (Windows 95, Windows NT, or Windows for Workgroups, but not the Microsoft Network online service) that is also connected to a UNIX-based computer. In this case, knowledgeable users of Samba's smbclient UNIX networking software can have full read-and-write access to your system's hard disk. The snooper's PC doesn't have to be connected directly to your local network—it could be any system with dial-in or Internet access to your server. In either case, the security breakdown occurs only if the Win 95 computer is configured to share files and printers—which is not the default setting.

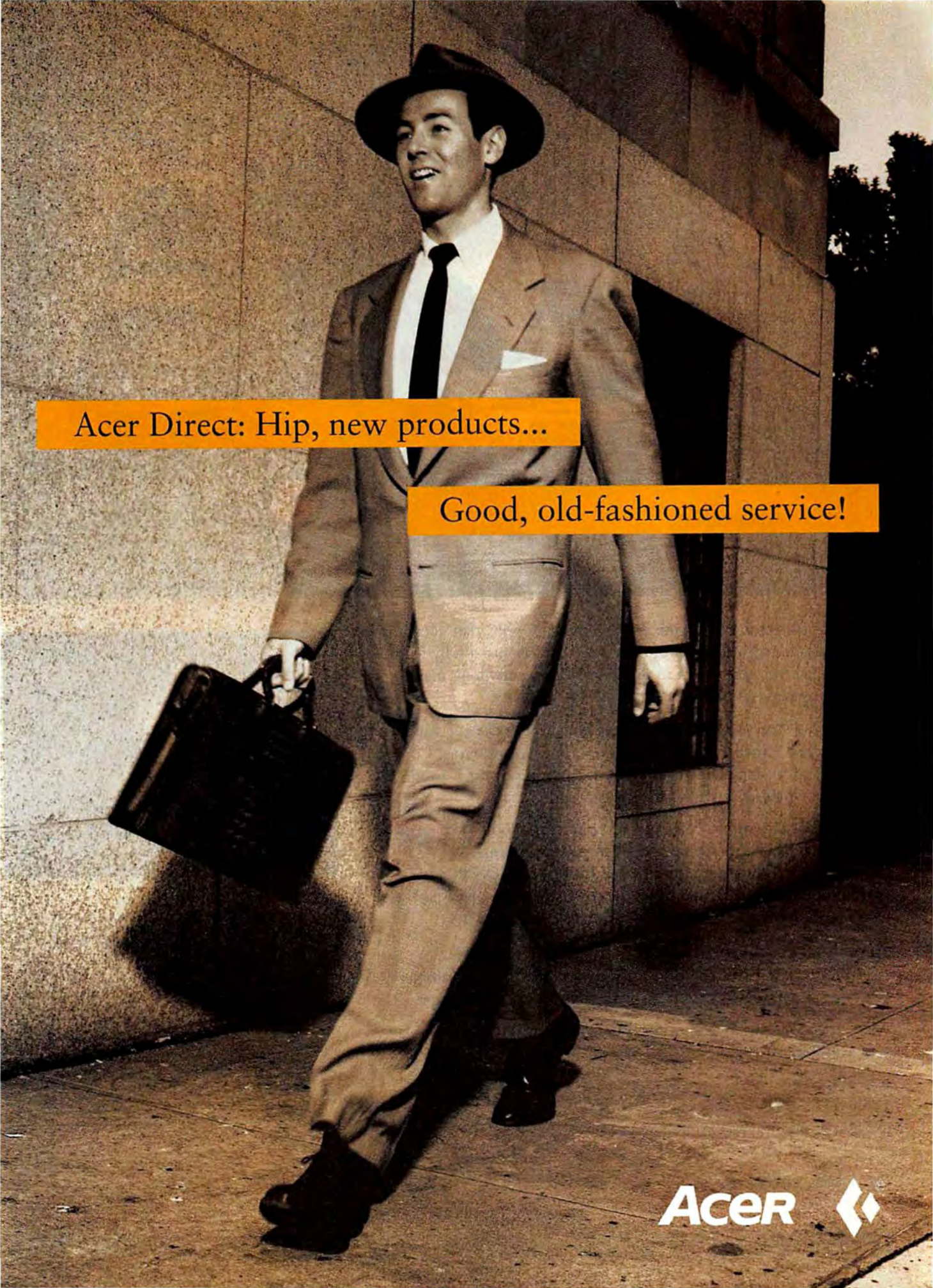
► **Fix:** Microsoft has released updated drivers for both network types to plug the security holes. You can download them (**vservupd.exe** for Microsoft networks, **nwsrvupd.exe** for NetWare) from Microsoft's Software Updates World Wide Web page (**http://www.microsoft.com/windows/software/w95fpup.htm**) or from The Microsoft Network, CompuServe, America Online, or Prodigy. You can also receive the drivers on a floppy by calling Microsoft's FastTips line (800/936-4200).

Norton Navigator Update

► **Fix:** Responding to reports of a sluggish Norton Navigator 1.0, Symantec has released a performance-enhancing update to its Windows 95 shell program. After you apply the Norton Navigator 95.0.a Maintenance Release to your existing installation, Symantec says, both Windows 95 and Norton File Manager (part of Navigator) should launch more quickly. The patch also promises to accelerate file operations, including searches. You can find the patch in the self-extracting archive file **nn95-0-a.exe** in the Norton Navigator library in Symantec's Windows 95 CompuServe forum (**go symnew**).

—Scott Spanbauer

Found a hardware or software bug? Call us at 415/978-3253, or post your report on PC World Online. We'll try to dig up a fix.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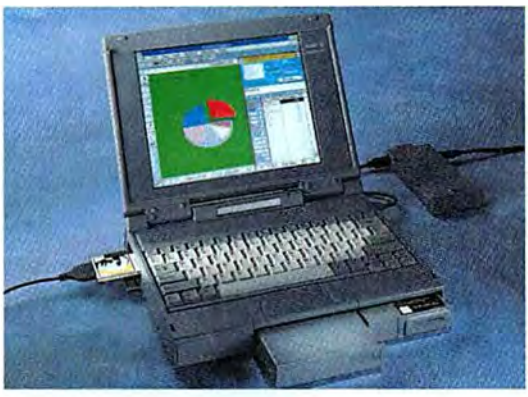

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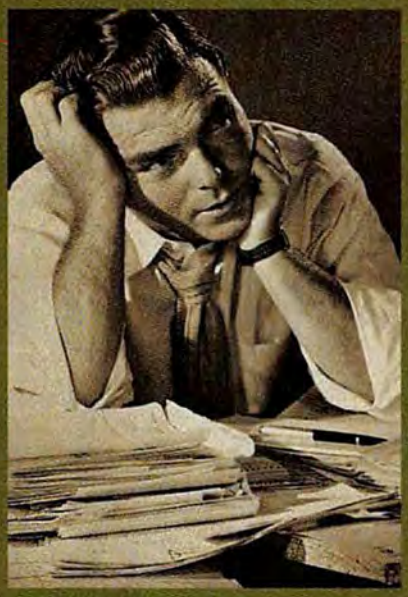

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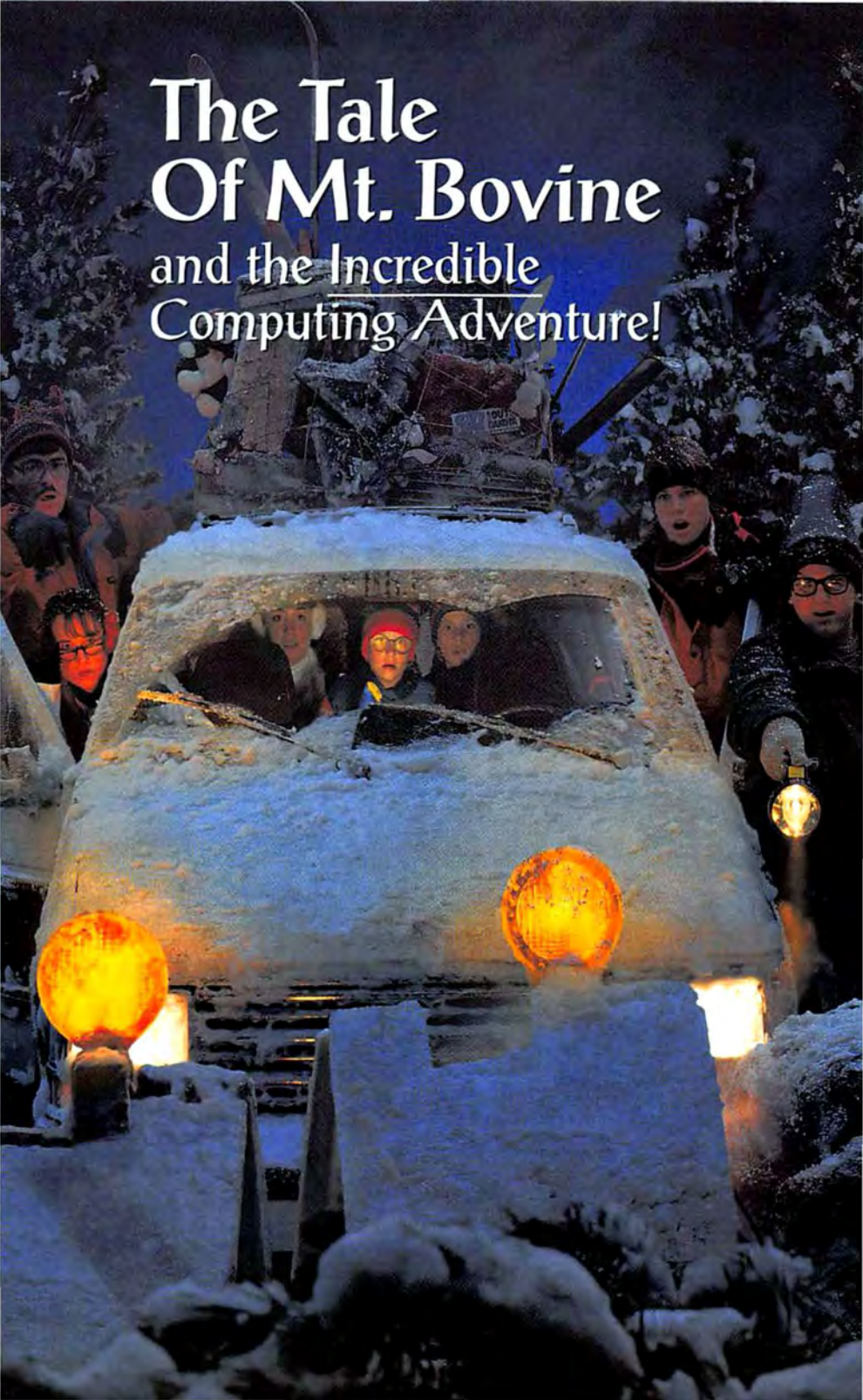
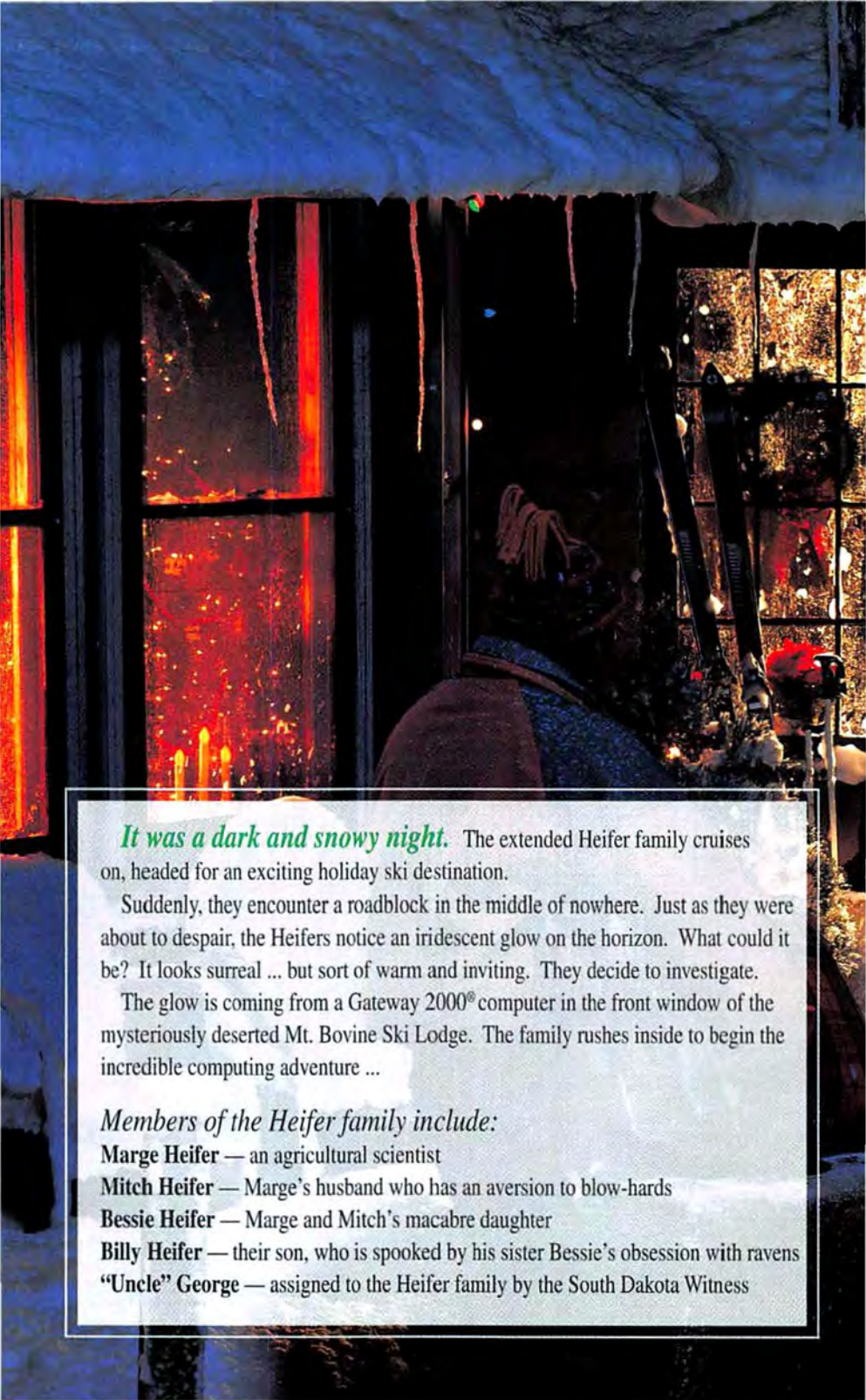

The Tale
Of Mt. Bovine
and the Incredible
Computing Adventure!



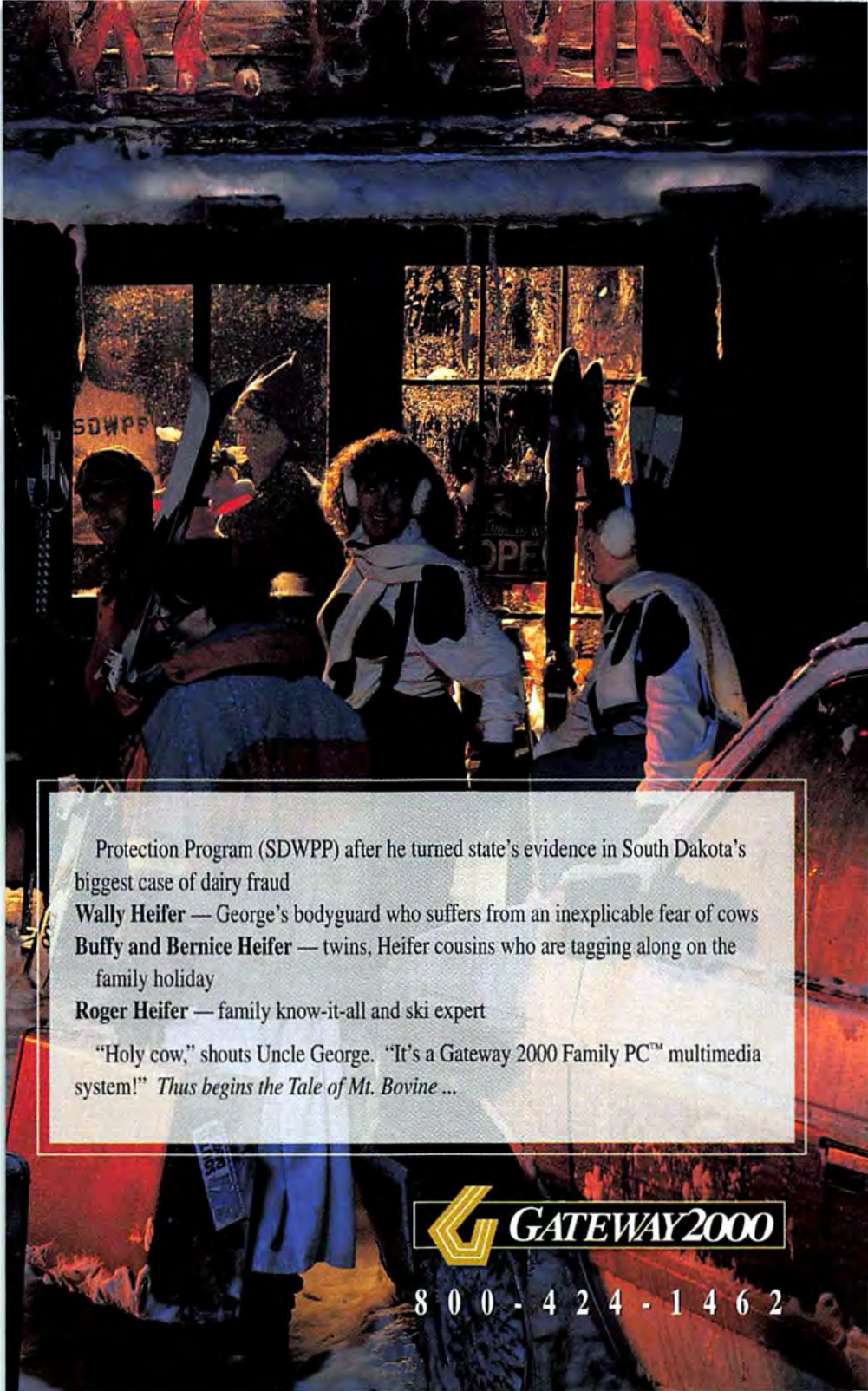
It was a dark and snowy night. The extended Heifer family cruises on, headed for an exciting holiday ski destination.

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 South Dakota'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 ...*

GATEWAY2000

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THE MASTERS
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"Wally, I'm happy as all get-out with this Gateway computer. Go out there and ski 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 $2,149 — 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 hard drive 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 system 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.

800-424-1462

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.

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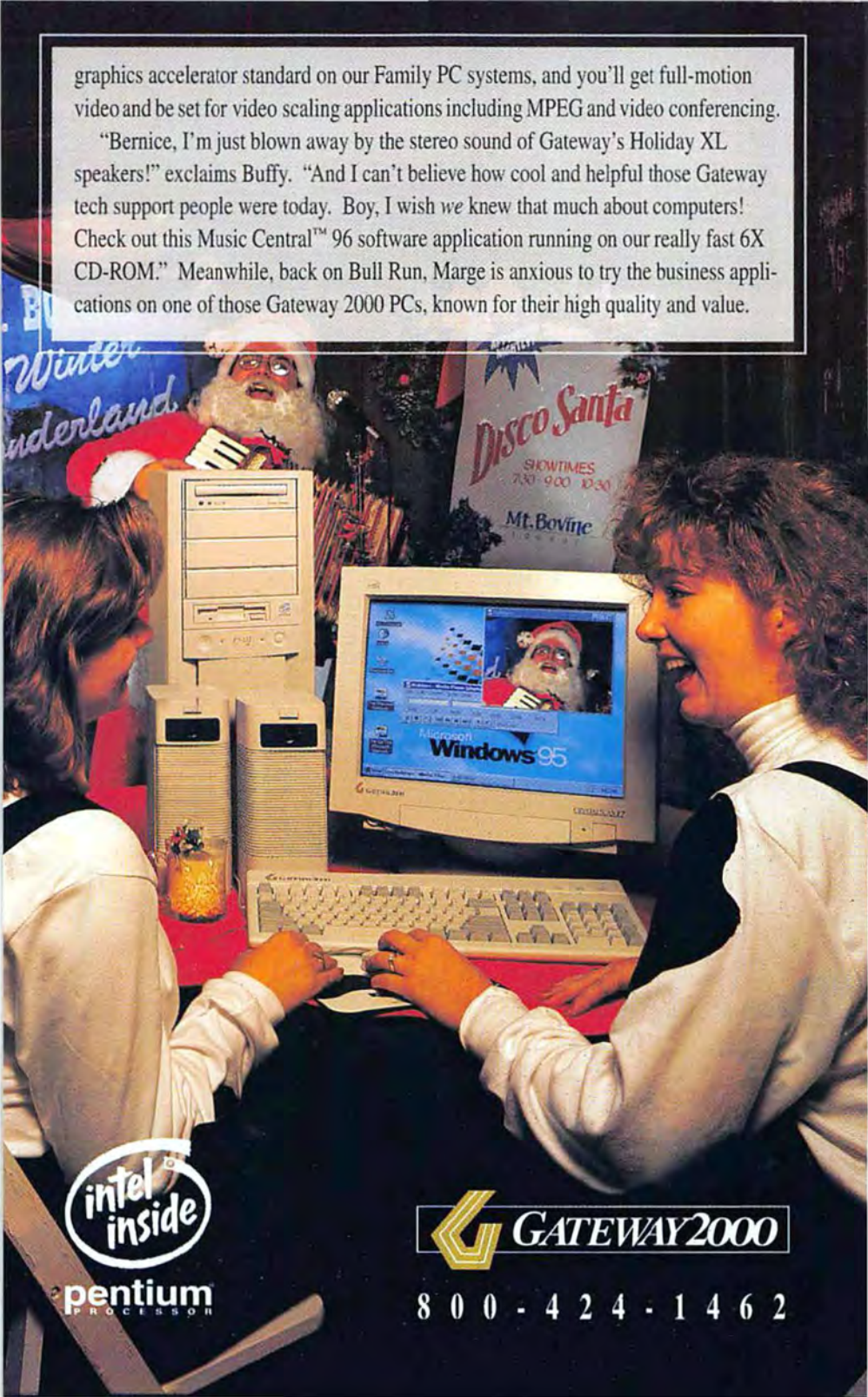
Be ready for tomorrow's technology with this lightning-fast 6X CD-ROM drive. It's the fastest EIDE CD-ROM found anywhere with 900KB/second data transfer rate and 214ms average access time. Combine the 6X CD-ROM with any Gateway

graphics accelerator standard on our Family PC systems, and you'll get 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.

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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

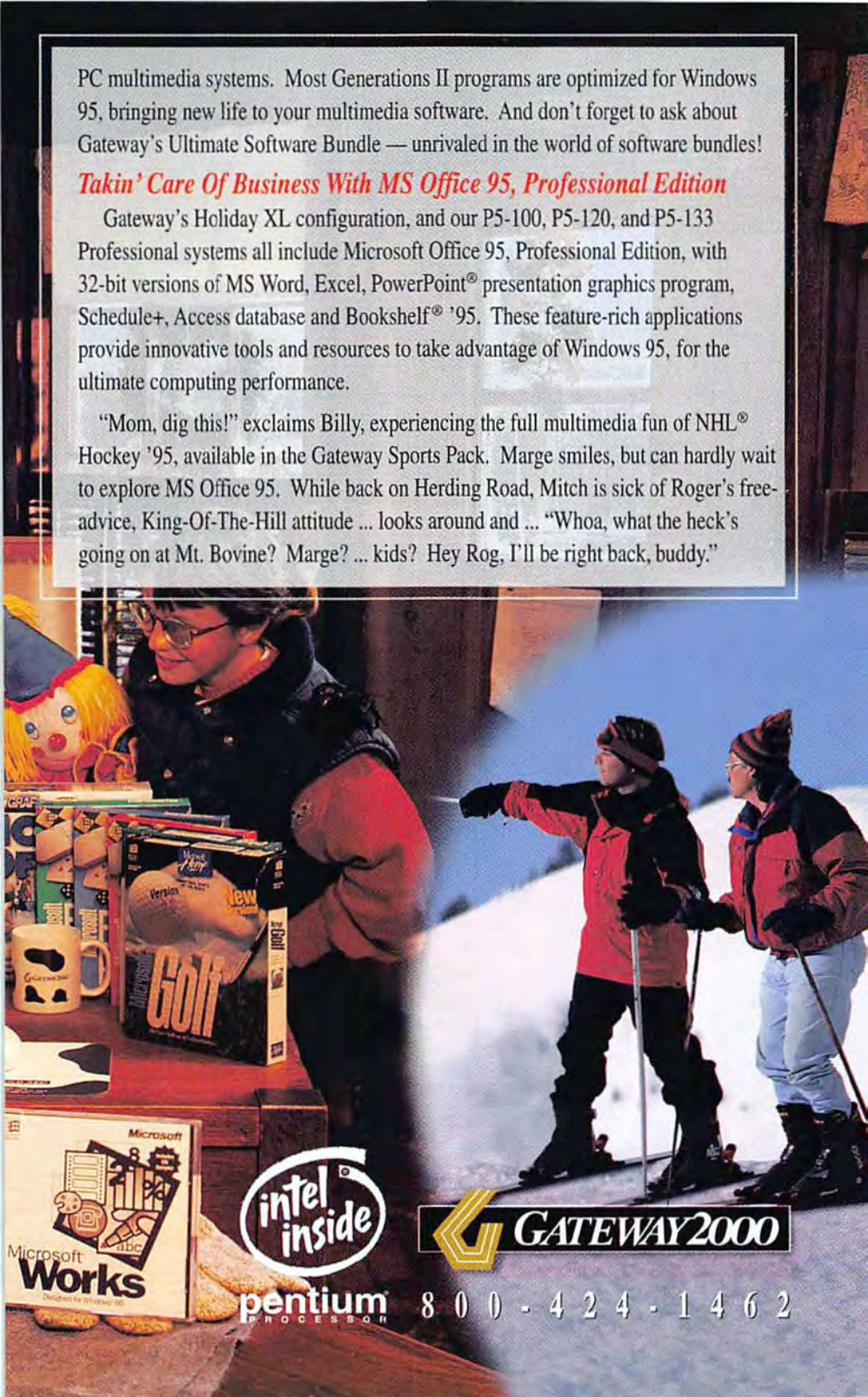
Featured with optional 17" CrystalScan monitor.

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 Microsoft Office 95, Professional Edition, with 32-bit versions of MS Word, Excel, PowerPoint® presentation graphics program, Schedule+, Access database and Bookshelf® '95. These feature-rich applications provide innovative tools and resources to take advantage of Windows 95, for the ultimate computing 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
GATEWAY 2000
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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 navigation around this new universe easy. The Information Highway CD features a cool user interface with point-and-click icons 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™ communication software on the Information Highway 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 world-wide 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!"

800-424-1462

"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-Days No Payment Program."

Value-Packed Pentium-Processor 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 95 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 technical 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!

GATEWAY2000

800-424-1462

Gateway 2000® Family PC™ Systems

P5-75 FAMILY PC

- Intel® 75MHz Pentium® Processor
- 8MB EDO Performance DRAM
- **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™ Lansing ACS-40 Speakers**
- TelePath® 14.4 Fax/Modem Communication Center
- **Gateway Information Highway CD**
- 3.5" Diskette Drive
- 14" .28dp CrystalScan® Color Monitor
- 7-Bay Desktop Case
- **104+ Keyboard** & MS Mouse 2.0
- **Microsoft® Windows® 95**
- **Generations II Software Collection**
- **Gateway Gold™ Service & Support**

$1799

P5-100 FAMILY PC

- Intel 100MHz Pentium Processor
- 8MB EDO Performance DRAM
- **1GB 10ms DMA Mode 1 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **64-Bit PCI Graphics Accelerator w/ 2MB DRAM**
- 4X EIDE CD-ROM
- 16-Bit Gateway Sound Card
- **Altec Lansing 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**

$2149

P5-120 FAMILY PC

- Intel 120MHz Pentium Processor
- 8MB EDO Performance DRAM
- **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 Lansing 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.

ISO 9002 SGS

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

** MS Office 95, Professional Edition includes Word, Excel, PowerPoint® presentation graphics program, Schedule+, Access database and Bookshelf® 95.*

Gateway 2000 Family PC Systems

HOLIDAY XL

- Intel 133MHz Pentium Processor
- 16MB EDO Performance DRAM
- 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 Lansing 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
- 12-Bay Tower Case
- **104+ Keyboard** & MS Mouse 2.0
- **MS Windows 95**
- **MS Office 95, Professional Edition***
- **Generations II Software Collection**
- **Gateway Gold Premium Service†**

$3499

Gateway 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 a gaming pad — all for an unbeatable value!*

†Includes priority access to technical experts and extends on-site service agreement to three years total.

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 for most locations, and when our technicians determine it's necessary.
***Call or write us for a free copy of our warranty or on-site service agreement.*

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GATEWAY2000

800-424-1462

Professional Systems

P5-75

- Intel® 75MHz Pentium® Processor
- 8MB EDO Performance DRAM
- **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 EDO Performance 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

P5-120

- Intel 120MHz Pentium Processor
- 16MB EDO Performance 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 EDO Performance 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**
- 6X 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

Professional Systems

G6-200

- Intel 200MHz Pentium Pro Processor
- **64MB DRAM**
- **2GB 10ms DMA Mode 2 EIDE Hard Drive**
- PCI Enhanced IDE Interface
- **Matrox® MGA™ 2MB WRAM Graphics Accelerator**
- **6X EIDE CD-ROM Drive**
- 3.5" Diskette Drive
- 17" .28dp CrystalScan Color Monitor
- 12-Bay Tower Case
- 104+ Keyboard & MS Mouse 2.0
- **MS Windows NT™ Workstation 3.51**
- **MS Office 95, Professional Edition***
- **Gateway Gold Premium Service**

$6199

The G6-200 Professional system has not been approved by the Federal Communications Commision. This device is not, and may not be, offered for sale or lease, or sold or leased until the approval of the FCC has been obtained.

Microsoft® Windows NT Workstation 3.51 Upgrade

If your work demands a powerful operating system, you need MS Windows NT Workstation. Run your 32-bit applications with crash protection and preemptive multitasking, better network access, improved security, and the capability to handle large data files. Available as an upgrade on the P5-120 and P5-133 Professional systems in selected configurations at time of system purchase. **$99**

Service Options

Gateway Gold Premium

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

Gateway Gold A 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 warranty or on-site agreement.*

** MS Office 95, Professional Edition includes Word, Excel, PowerPoint® presentation graphics program, Schedule+, Access database and Bookshelf® '95.*

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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™ Lansing 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 single 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 **Kid's 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 Tales 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**

NEW **Finance Pack**

Get your finances in order with this new software bundle. Includes Quicken® Deluxe 5; Quicken Financial Planner;™ Quicken Family Lawyer;™ Quicken Parents' Guide To Money;™ and a coupon to receive TurboTax® Deluxe upon release at no extra charge. **$79**

Starter Pack: The Sequel

A new twist on our favorite software bundle! Includes Tuneland;™ Cyberia;™ SimCity;™ Rand McNally TripMaker™ SE; Hometime® Weekend Home Projects; 70 Million Households Phone Book; Consumer Survival Kit; and The 7th Guest™. Also includes 12-CD flip-case holder. **$99**
(The 7th Guest may not be suitable for younger children.)

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**

Communications & Storage

TelePath® 28.8 Fax/Modem Communication Center

Internal fax/modem, 28,800bps modem, V.34, with 14,400bps fax capability. Sends and receives data and faxes, and also includes 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 TelePath 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**

American Power Conversion™ Back-UPS® 600

Protect your computer and data with an Uninterruptible Power Supply from American Power Conversion (APC), the power protection products leader. **$259**

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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® monitor to 15" Vivitron monitor **$160**

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

Gateway CrystalScan Color Monitors

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

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

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

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

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

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

Networking

3Com® Ethernet Adapters

10/100 Base-T PCI Card for CAT 5 Unshielded Twisted Pair **$159**

16-bit Triple Media Card with BNC, AUI and RJ-45 connectors **$99**

16-bit Card with only RJ-45 connector **$79**

SMC PCI Ethernet Adapter

32-bit Card with both RJ-45 and BNC connectors **$119**

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, and is easy to use. **$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. Plus, it's quiet and compact. **$449**

Hewlett® Packard 5L-FS Printer

Add professional edge to your outputs with 600dpi and HP Resolution Enhancement technology. You'll also enjoy fast laser printing with this printer's speedy 4-ppm engine. **$499**

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 R

Corporate-quality printer with networking capabilities. Features a 25MHz RISC processor, 2MB memory, true 1200 x 1200dpi, 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 Edition offers are available to existing Gateway 2000® customers only as upgrades to DOS® and 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 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, PowerPoint® presentation graphics, Schedule+, Access database, and Bookshelf® '95. **$264**

Windows 95 & Office 95 Professional Edition 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 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, PowerPoint presentation graphics, Schedule+, Access database, and Bookshelf '95. **$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 are currently within your one-year on-site service agreement, you can upgrade to the Gateway Gold Premium service option for $99.

Gateway Gold Premium

- Extended 3-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
- Expandable to 40MB RAM
- 256K L2 Pipelined Burst Cache
- 1MB Video RAM
- Lithium Ion Battery & AC Pack
- 2 PCMCIA Type II or 1 Type III Slot
- EZ Pad™ Pointing Device
- Removable Hard Drive
- 3.5" Modular Floppy Drive
- Integrated 16-Bit Sound with Stereo Speakers
- 86-Key MS Windows® 95 Keyboard
- Parallel, Serial, VGA, PS/2® & Infrared Ports
- Built-In Mic, Headphone and Line-In Jacks and External Volume Control Dial
- Starting at 5.6 Lbs.*, 11.8" x 8.8" x 2.0"
- 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
- Modular CD-ROM Drive
- 540MB Hard Drive
- MS Works 95
- Carrying Case

$3499

V90 DELUXE

- 10.2" VGA (640 x 480) Display
- 90MHz Intel Pentium Processor
- 8MB RAM
- Modular CD-ROM Drive
- 540MB Hard Drive
- MS Office 95, Professional Edition†
- Carrying Case

$3799

S120 BEST BUY

- 10.4" SVGA (800 x 600) Display
- 120MHz Intel Pentium Processor
- 16MB RAM
- Modular CD-ROM Drive
- 1.2GB Hard Drive
- 28.8 PCMCIA Fax/Modem
- Desktop IR Module
- Extra Lithium Ion Battery
- MS Office 95, Professional Edition†
- Deluxe Leather Carrying Case

$5999

V120

- 10.2" VGA (640 x 480) Display
- 120MHz Intel Pentium Processor
- 16MB RAM
- Modular CD-ROM Drive
- 720MB Hard Drive
- MS Works 95
- Carrying Case

$4299

S90 DELUXE

- 10.4" SVGA (800 x 600) Display
- 90MHz Intel Pentium Processor
- 16MB RAM
- Modular CD-ROM Drive
- 1.2GB Hard Drive
- MS Office 95, Professional Edition†
- Carrying Case

$4799

**5.6-pound configuration includes: 540MB Hard Drive, SVGA Active Matrix Color Display and Option Bay Cover.*

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GATEWAY 2000® LIBERTY™

- 10.4" SVGA DSTN Color Display
- Intel 486 DX4-100 Processor
- 4.2 Lbs., 10" x 8" x 1.6"
- 1MB Video RAM
- NiMH Battery & AC Pack
- 2 PCMCIA Type II or 1 Type III Slot
- EZ Point™ Integrated Pointer
- Removable Hard Drive
- Choice of Desktop IR Module or External Floppy Drive
- 78-Key Keyboard
- Parallel, Serial, VGA & PS/2 Ports
- Ascend personal information manager (for use with Franklin Day Planner)
- Microsoft Windows 95**

DX4-100

- 8MB RAM (expandable to 24MB)
- 340MB Hard Drive
- 256K L2 Cache
- External Floppy Drive
- MS Works 95

$2599

DX4-100 DELUXE

- 16MB RAM
- 540MB Hard Drive
- 256K L2 Cache
- External Floppy Drive
- MS Office 95, Professional Edition†

$3099

† MS Office 95, Professional Edition includes Word, Excel, PowerPoint® presentation graphics program, Schedule+, Access database and Bookshelf® '95.

***MS-DOS® 6.22 and MS Windows for Workgroups 3.11 available upon request.*

Designed for Microsoft Windows 95

PC MAGAZINE EDITORS' CHOICE August 1995 Gateway Liberty DX4/100

PC WORLD BEST BUY

90 DAYS NO PAYMENTS

Ask About Our "90 Days No Payment" Program!

DX4-100 BEST BUY

- 24MB RAM
- 720MB Hard Drive
- 256K L2 Cache
- 2 NiMH or 1 Lithium Ion Battery
- TelePath® 14.4 XJACK® Fax/Modem
- Desktop IR Module
- External Floppy Drive
- MS Office 95, Professional Edition†
- Liberty Leather Carrying Case

$3599

PERIPHERAL OPTIONS

- Panasonic® KXL-D720 External CD-ROM Drive **$299**
- PCMCIA 14.4 XJACK Send/Receive Fax/Modem **$159**
- 28.8 PCMCIA Fax/Modem **$299**
- PCMCIA Network Adapters
  3COM® Twisted Pair Ethernet **$129**
  3COM Coaxial Ethernet **$159**
  IBM® Token Ring **$399**
- Extra Solo Lithium Ion Battery **$200**
- Extra Liberty NiMH Battery **$99**
- Extra Liberty Lithium Ion Battery **$199**
- Desktop IR Module **$79**
- Call for additional memory and hard drive options.

SERVICE & WARRANTY

- Call for service and warranty options.
- Lifetime portable-specific toll-free support 24 hours a day, 7 days a week.
- One-year limited warranty standard. (For a free copy, call or write.)
- Three-year limited warranty option. **$100**

GATEWAY 2000

800-424-1462

All members of the cast are Gateway employees or their family members. Wishing you a very merry holiday season are: ***Marge*** *(Michelle from Sales); the twins* ***Bernice and Buffy*** *(Katie from Creative Services and her twin sister Mollie),* ***Uncle George*** *(Wes from Information Systems),* ***Roger*** *(Dave from Marketing),* ***Mitch*** *(Ed from Technical Support),* ***Wally*** *(Dax from Portables Technical Support),* ***Bessie*** *(Ed's daughter Mandi), and* ***Billy*** *(Ed's son Quinn, who couldn't be dragged away from NHL® Hockey '95 for this photo).*

Designed for Microsoft Windows 95

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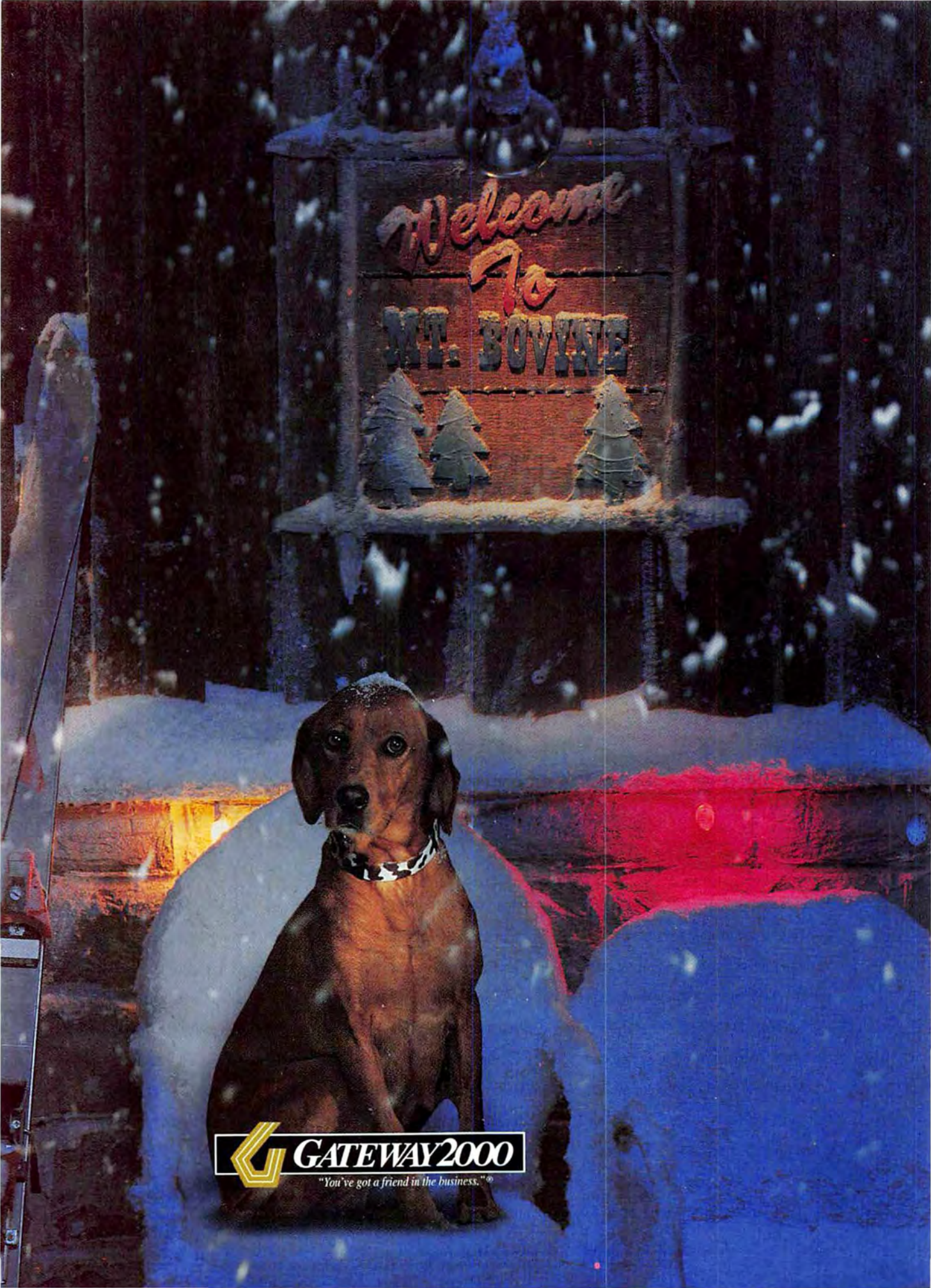
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"You've got a friend in the business."®

It's SO real you can still blame the clubs, the lie, the bunkers, the trees, the rough, and the water.

Excuses, excuses. It's the game of golf. And nothing comes closer to the game than new Microsoft® Golf 2.0 CD.

This is the ultimate golf experience — right on your PC. Whether you're playing on Windows® 3.1 or the new Windows 95 operating system, it's as easy as it gets. Tee it up at either Firestone South or Torrey Pines South. Don't sweat your hooks and slices because even your worst drive will look awesome with photo-realistic trees, sparkling water, and sailboats in the bay. Aerial fly-by views help you decide when to pull out a fairway wood and go for the green. Video clips from course pros offer tips on each hole. All you have to do is hit the ball where they tell you. (Easier said than done.)

And if you're running Windows 95, the PlayerNet™ system for new Microsoft Golf 2.0 allows you to play head-to-head with friends. Putt for the big bucks in the new skins game format. Miss it and you'll be subjected to your opponents' scathing comments.

PLAYERNET

See your software retailer today to pick up a copy of the most popular golf game available. And please, remove your spikes before entering the store.

Microsoft

WHERE DO YOU WANT TO GO TODAY?®

For more information on Golf 2.0 and PayerNet, log onto http://www.microsoft.com/msgolf.

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HP and Zenith Up the Ante on Pentium Notebooks

The powerful new portables from Hewlett-Packard and Zenith epitomize the metamorphosis of the notebook market. The lightweight subnotebooks of just a few years back are rapidly being pushed aside by full-size Pentium-powered units with bells and whistles aplenty. These 6-to-8-pound units are designed for people who want a no-compromise portable with all the features of a high-end desktop.

The HP OmniBook 5000 and the Zenith Data Systems Z-Note GT portables both come with either 75- or 90-MHz Pentium processors, secondary cache for maximum performance, PCI bus architecture, Type III PC Card slots, lithium-ion or nickel–metal-hydroxide batteries, and loads of hard disk and multimedia options. Of course, screens are an area of intense competition in the notebook arena.

HP OmniBook 5000

High-end Pentium saves size and weight by leaving out a CD-ROM drive and speakers.
Hewlett-Packard
800/443-1254
http://www.hp.com
List price: Starts at $3915
Reader service no. 754

Z-Note GT

Pentium power with CD-ROM drive, speakers, optional MPEG-1, and the first 11.3-inch SVGA display.
Zenith Data Systems
800/533-0331
http://www.zds.com
List price: Starts at $3999
Reader service no. 755

HP OmniBook 5000

To save power and weight, HP did not build in a CD-ROM drive or speakers. However, the OmniBook 5000 has a built-in SCSI-2 port for easy peripherals connection. A 16-bit Sound Blaster–compatible adapter is also built in, along with a MIDI/joystick port. Also standard is an NTSC port for sending the OmniBook's video output to any standard television monitor.

The OmniBook 5000 comes with a 10.4-inch active-matrix screen that's available in standard VGA (640 by 480) or Super VGA (800 by 600). You have three hard-disk options: 520MB, 810MB, and 1GB.

HP has taken into consideration that many people prefer to use high-powered notebooks as their primary system. It's designed a docking station (price not available at press time) that lets you connect the OmniBook to a standard monitor, keyboard, the office LAN, and other peripherals. The docking station also has two ISA slots.

Z-Note GT

Zenith Data Systems pulls out all the stops with its Z-Note GT notebook. The unit comes with a built-in Sound Blaster–compatible sound adapter and NTSC video out; a pair of built-in speakers and a 2X CD-ROM drive (which is upgradable to 4X for an extra $199) are standard as well. Peripherals can be limited by Zenith's SmartBay design, which can accept either a floppy drive, a CD-ROM drive, an extra hard drive, or an extra battery, but not at the same time. An optional MPEG playback adapter is also available, although at $399, it's pricey.

NOTEWORTHY: The 11.3-inch Super VGA screen on the Zenith Z-Note GT makes reading between the lines clear.

Even more intriguing are the Z-Note GT's display options. An active-matrix 10.4-inch screen is standard, but you can also opt for a big, bright 11.3-inch dual-scan model. Although competitors are sure to follow, this is the first screen of its size that offers 800 by 600 SVGA—perfect for getting the big picture on those spreadsheets or other applications. Drives are available in 810MB and 1.3GB capacities.

Another built-in Z-Note feature is an infrared port for easy communications with other Infrared Data Association–compatible systems. Unlike HP, ZDS does not offer a full-fledged docking station, although a $139 port replicator lets you hook up the Z-Note to peripherals in your office. All these extra features bring the Z-Note's weight to nearly 8.5 pounds—but that's not unreasonable, considering everything that's included.

Options and Trade-Offs

On a feature-for-feature basis, the OmniBook and the Z-Note prices are similar, and you can pick and choose components to meet your needs (not to mention your budget). The Z-Note's the obvious choice if you want everything in one package. Choose the HP for a lighter-weight unit with convenient docking capabilities.

–Stan Miastkowski

Lexmark Updates Optra Line, Introduces Color Laser

Lexmark's updated Optra line of laser printers takes aim at Hewlett-Packard's dominance in the network printer market. The five-printer line, which now includes a color laser model, has improved speed and paper handling. Prices are comparable to those of HP's LaserJet 4 family.

In their standard configurations, all five Optras print at 600 by 600 dots per inch. The monochrome Optras can also print true 1200 by 1200 dpi if you upgrade their memory to at least 8MB. Lexmark retains the high-quality design and documentation we've praised in past models.

The Optra R+ replaces the basic Optra R, currently a Best Buy in our *Top 10 Workgroup Printers* (see "Two Hot Numbers Debut: HP LaserJet 4M Plus and 4MV"). The Optra R+'s engine speed is 16 pages per minute (upgraded from 12 ppm). In our preliminary tests, the Optra R+ performed more than 13 percent faster than the Optra R. Yet the street price for a standard setup, including 2MB of RAM, a 200-sheet input tray, plus PCL5e and PostScript Level 2, is just $1449.

The Optra Lx+ and Lxi+ offer higher paper capacities than the Optra Rs. In our preliminary tests, these models are just as speedy as their predecessor, the Lx. The $2299 Optra Lx+ comes with a 500-sheet input tray, and the $2999 Optra Lxi+ comes with two 500-sheet input trays.

The $6400 color Optra C is rated at 12 ppm in monochrome and 3 ppm in color. Look for our review of all the new Optras in the March *Top 10 Workgroup Printers* review.

—Bill Underwood

PRINT ON: Lexmark's latest Optra laser printers are speedier than ever, and one of them—the Optra C—prints in color.

Lexmark Optra Laser Printers

Lexmark revamps its Optra family of networkable lasers, introduces color laser.
Lexmark Int'l
800/891-0331
Street prices: Optra R+ $1449, Optra Rt+ $1699, Optra Lx+ $2299, Optra Lxi+ $2999, Optra C $6400
Reader service no. 756

LCD Projectors Make the Picture More Affordable

Giving a PC-based presentation is easy, as long as your audience is small enough to crowd around a notebook screen. It's when you want to put on a show for a larger group that things get complicated. You can use an LCD panel to project your presentation onto a screen—but panels work only when teamed with overhead projectors.

But if you carry an all-in-one, active-matrix LCD projector such as the new Proxima Desktop Projector 2400 or Sharp XG-E650UB Mark II, you'll be prepared for almost any presentation circumstances. These units can project high-quality computer and video displays at sizes up to 10.5 feet diagonal (Proxima) or 12.5 feet diagonal (Sharp). Both project crisp imagery at 640 by 480 resolution with a palette of 16.8 million colors. At almost $6500 each, they may not sound like bargains, but they're significantly less expensive than earlier models, which typically sold for $9000 or more.

Because the Desktop Projector and the Mark II use less powerful lamps than costlier models, they are best suited for presentations in darkened rooms before groups of no more than a few dozen people.

Proxima's and Sharp's projectors weigh around 20 pounds each and are roughly the size of an electric typewriter. Both units include wireless remote controls and on-board amplifiers and speakers that can deliver your presentation's sound track loudly and clearly.

In my tests, the Proxima produced a slightly brighter, more vivid picture, and its dual-lamp design lets you keep going even if one lamp burns out. The Sharp, however, has a zoom lens, which makes adjusting the picture size to fit any screen much simpler, and its remote control is backlit for easy use in a darkened room.

—Harry McCracken

Proxima Desktop Projector 2400

Dual-bulb LCD projector displays attractive color images.
Proxima
800/447-7694
List price: $6295
Reader service no. 757

Sharp XG-E650UB Mark II

Zoom lens and backlit remote control add to this projector's usability.
Sharp Electronics
800/237-4277
List price: $6495
Reader service no. 758

QUARTERDECK

Quarterdeck CleanSweep™ 95 is the first 32-bit uninstaller for all versions of Windows. We also believe it's the only uninstaller worth looking at, period. But you don't have to take our word for it. "When you delete files, CleanSweep bundles them into a package, compresses them, and archives them where it can find them again... this looks to be... one of the 'must have' Windows '95 supplementary programs." JERRY POURNELLE, BYTE, NOV 95 "CleanSweep 95's user interface is still the simplest and most intuitive of all the commercial uninstallers PC Week Labs has seen... CleanSweep's system cleanup features were very strong, helping us find duplicated, unused, and orphaned files to remove from our systems." JIM RAPOZA, PC WEEK, NOV 95 "To the rescue comes Quarterdeck's new CleanSweep. When I installed CleanSweep, I had a spindly 5MB left on my 340MB hard disk's C: partition. As I write this I have 33MB. CleanSweep 95... is the janitor who can get you back that accidentally tossed manila folder the next day. It gives you a new lease on disk space with a vow never to let you junk your drive up again." PAUL ANDREWS, SEATTLE TIMES, OCT 95

Circle 225 on reader service card

Is Sony's 140MB MiniDisc Drive the Next Betamax?

Sony has great hopes for its MiniDisc Data format as the next-generation mass storage media. And why not? On the surface, it has a lot going for it. A blank 2.5-inch magneto-optical MiniDisc offers 140MB of rewritable storage, and Sony promises the discs can be rewritten more than a million times with no loss of data integrity.

The battery-powered MDH-10 drive's portability and its high-capacity MiniDiscs allow for easy transfer of data from a desktop to a notebook PC. And the Macintosh- and PC-compatible MiniDiscs can handle a hybrid of read-only and rewritable sections. The drive can also play back audio MiniDiscs (but Sony supports only the disc format).

With a footprint about the size of an average Walkman, the MDH-10 drive is smaller than the Iomega Zip Drive and weighs in at just 12 ounces, including its rechargeable lithium-ion battery pack. The drive also works with the AC adapter that's included or with three AA alkaline batteries.

But the MDH-10 and its MiniDiscs are expensive: The drive lists at $769.95, and each blank disc is $29.95. Compared to Iomega's $199 Zip Drive, which uses 100MB floppy-like disks that cost under $20 each, and Syquest's $240 portable EQ-135 drive, the MDH-10 is no bargain. This is especially true when you consider that the MDH-10 requires Sony's $259 SCSI PC Card (or a comparable PC Card) for your notebook and a SCSI port for your desktop.

While the MDH-10 and MiniDisc have great storage potential, Sony is simply aced out by more affordable technologies like the Zip Drive's.

–Michael S. Lasky

Sony MDH-10

Portable, proprietary MiniDisc drive handles 140MB read/write data.
Sony Electronics Inc.
800/352-7669
List price: $769.95, 140MB discs $29.95 each
Reader service no. 759

DATA TO GO: Sony's MDH-10 drive is a little bigger than a Walkman but can store 140MB of data on a 2.5-inch disc.

Sound Proposition: Two Cards in One

It's been my experience that whenever a new computer technology emerges, the only people who can use it successfully are the people who wrote the ad copy.

Multifunction add-in cards, for example, look good on paper. But I approached with skepticism the SoundExpression 28.8SRS and Voyager Movie Player, Boca Research's two latest multifunction cards, which incorporate a new technology called SRS 3-D Surround Sound. Fortunately, this time I was pleasantly surprised.

The SoundExpression fax-modem integrates a 28.8-kbps modem with a 16-bit sound-capable card and digital voice mail. I was able to record professional-sounding messages for incoming calls, access remote message retrieval, and set up multiple password-protected mailboxes. And my favorite games and multimedia titles sounded great with MIDI and FM-synthesized sound, which was more powerful with the SRS technology. SRS promises to deliver cinematic Surround Sound–like quality even if you have only standard speakers. When I tested this feature with my generic speakers, I found that the sound was both richer and fuller.

Boca also offers the Voyager Movie Player graphics card, which boasts an S3 Trio64V+ video accelerator chip. It includes 1MB of DRAM and an MPEG-1 chip, so I could play full-screen motion pictures like *Four Weddings and a Funeral* on my PC. My graphics were smooth and fast with this card. The SRS chip, in this case, enhances only the sound quality in a video. Games still require a dedicated sound card.

If your computer is short on expansion slots but you still want lots of extras on your machine, Boca Research offers two good solutions. Although the savings over single-purpose boards are marginal, these multipurpose boards come with a five-year warranty and free technical support.

–Shane Mooney

SoundExpression 28.8SRS

Feature-filled 28.8 kbps fax-modem with full 16-bit SRS 3-D sound on one board.

Voyager Movie Player

64-bit graphics with MPEG-1 chip and SRS 3-D sound.
Boca Research Inc.
407/997-6227
List price: SoundExpression 28.8 SRS $369, Voyager Movie Player $399
Reader service no. 760

QUARTERDECK.

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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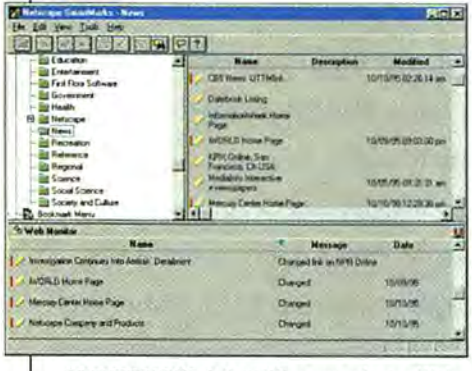
Web Browsing Made Better

Like a fine wine, good software often features a subtle blend of ingredients that brings out its best. Netscape Navigator 2.0 offers a mix of tools that takes World Wide Web browsing and services to new heights, making them more approachable than ever. (*PC World*'s parent company, IDG, has an equity investment in Netscape.)

Navigator is no longer just a Web browser. Version 2.0 for Windows 3.*x* and Windows 95 gives you integrated e-mail and Usenet clients, as well as support for Multipurpose Internet Mail Extensions files and Java, a new, platform-independent programming language for Internet applets. These tools strengthen Navigator's World Wide Web presence by making Web browsing more active.



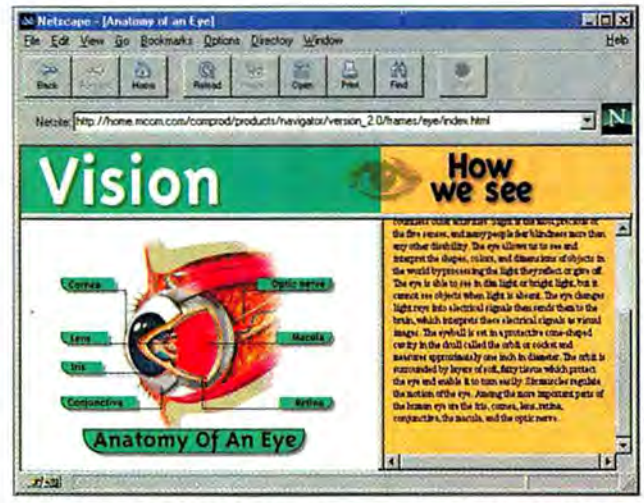
SMARTMARKS 1.0 notifies you when a Web page you're monitoring is modified.

The new e-mail client, which is accessible from the Windows drop-down menu, replaces version 1.*x*'s bundled Eudora e-mail reader. And it supports MIME attachments.

Though it wasn't implemented in the beta release I examined, Netscape says that its new e-mail client also supports Secure MIME, which allows you to encrypt and digitally sign messages, as well as Secure Courier, which lets you safely conduct credit card transactions over the Internet; only a credit card authorization company can decrypt such transactions. Netscape's support of Secure Courier should enhance Internet commerce, though a similar technology, CyberCash digital wallet software, has been available since early 1995.

MIME isn't version 2.0's only multimedia improvement. By using third-party viewers, you can look at *inline* graphics (images embedded into Web documents) that Web page authors created with Macromedia Director, Adobe Acrobat, or QuickTime video. A new file format called Progressive JPEG lets you load images up to three times faster than GIF files, Netscape says. In addition, *frames*, or multiple windows on the same screen, enable you to view a variety of images and text simultaneously. This means less reloading time because each image is loaded in its own window and doesn't require constant refreshing. But it works only when you're browsing a site written to support frames.

Java applets, which aren't yet common, will make working with the Web more interactive. With a single click, a Java applet downloads to your computer, where it processes data transmitted from a Web server.



NAVIGATOR 2.0 FRAMES let you view and interact with multiple Web windows simultaneously displayed on the same browser screen.

Eventually Java will also allow live data updates and direct two-way interaction.

Netscape SmartMarks 1.0

Like a mellow cheese partnered with a good wine, Netscape SmartMarks 1.0, an add-in bookmark manager, improves Web navigation when used with Navigator 2.0.

SmartMarks' graphical bookmark editor replaces Navigator's existing bookmark functions. (SmartMarks also works with other browsers.) The program comes with about 300 bookmarks organized into topical folders. You can add your own bookmarks through your browser or by importing a bookmark file. You can edit existing bookmarks, but you can't type addresses (URLs) directly into SmartMarks.

If you frequently check the same Web sites, you can set SmartMarks to monitor them for content changes. Unfortunately, the program isn't smart enough to automatically bring up the changed document or unflag the address; you must do it manually. And your list of monitored Web sites isn't loaded into the browser, so SmartMarks must briefly connect to each site, which can tie up your system resources.

With support for frames and inline plug-in viewers, Navigator continues to lead the Web pack. SmartMarks scores high for concept, but only average for execution.

—Peter Loshin

Netscape Navigator 2.0, Netscape SmartMarks 1.0

Netscape's new tools make Web browsing faster and more efficient.

Netscape Communications Corp.

415/528-2555

List price: Netscape Navigator 2.0 $49, upgrade $25; Netscape SmartMarks 1.0 $24.95

Reader service no. 781

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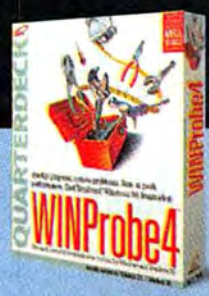

Nothing gets by WinProbe™. That's what makes it the most powerful and comprehensive troubleshooter toolbox for both Windows® and Windows 95.

If there's a problem hidden in your system, WinProbe will let you know while there's still time to do something about it. If there isn't a problem, 300 or so tune-up suggestions will help you keep it that way. It does everything a technician would do – except send you a bill.

TUNE UP

IT SAYS YOUR MEMORY IS FRAGMENTED, YOU HAVE A FAULTY RAM CHIP, YOUR SYSTEM REQUIRES OPTIMIZING, YOU HAVE A CACHE HIT RATE OF 48% AND YOUR FLYING TOASTER SCREEN SAVER IS GETTING A LITTLE MONOTONOUS.

Using non-destructive testing technology, WinProbe searches out problems, performs more than 200 tests, automatically optimizes your system resources – even gives you more available RAM by automatically defragmenting your Windows and Windows 95 memory. And all the while it keeps you informed on a real-time status panel like the one above.

Your part is easy. Because WinProbe works within Windows 95 and Windows 3.1, there's none of that popping in and out of DOS that seems to be such a popular theme among other troubleshooters. You get to work in a familiar environment, using the powerful features of Windows.

To find out more, see your retailer, visit our website at www.qdeck.com, or give us a call at 1-800-683-6696. And do something about that paisley mousepad will you?

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Balancing the Books From High to Low

Managing your company's books can be intimidating. There are forms to fill out, schedules to keep, and numbers, numbers, numbers. Two new accounting packages—QuickBooks 4.0 and DacEasy Accounting & Payroll 95—can help small and medium-size businesses administer their finances more easily.

Scalable Bookkeeping

While most accounting packages give you an exhaustive program menu, QuickBooks 4.0, Intuit's small-business accounting program, scales menu items to meet your business needs. For example, if you don't need to track product inventory, QuickBooks removes the related functions from the program menus.

QuickBooks 4.0's EasyStep interview guides you through the usually daunting process of setting up your books by asking specific questions about your business.

The new version of QuickBooks has caught up to other accounting programs by including improved administrative aids, such as a contact manager, as well as statements and invoices that are customizable. QuickBooks 4.0 and the more expensive QuickBooks Pro run under both Windows 3.1 and Windows 95.

Superaccounting

DacEasy Accounting & Payroll 95 takes the aggravation out of managing your accounting system. This new, 32-bit version makes it easier than ever to extract only the information that you need. (It also runs under Windows 3.1.)

The new report layout manager is outstanding. The great flexibility it provides in creating and modifying reports goes beyond QuickBooks' ability. You can now have up to 999 departments, product categories, and fixed-asset categories. You can also drill down to examine account details.

I found DacEasy easier to use than its predecessors because of improvements like Flash Cards that offer instant help on program functions, and Wizards that lead you through complicated procedures such as setting up accruals and expense prepayments.

Overall, QuickBooks is more appropriate for accounting neophytes. DacEasy's broader accounting capabilities and 32-bit design (under Windows 95 and NT) will appeal to users with more accounting experience.

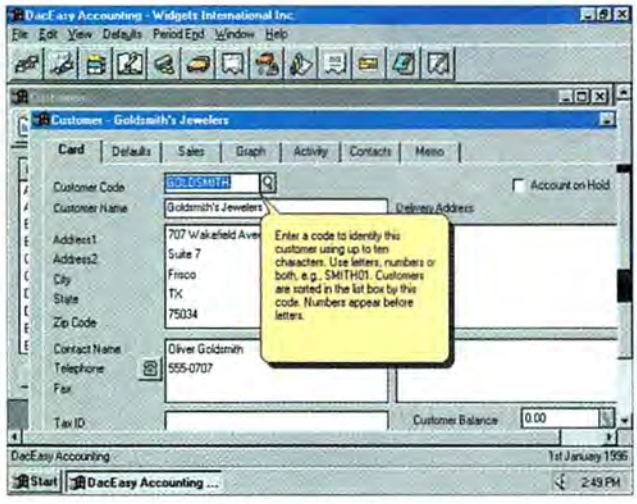
–Richard Morochove

DacEasy Accounting & Payroll 95

Flexible financial reporting and a broad range of accounting functions.
DacEasy, Inc.
800/322-3279
Street price: $95
Reader service no. 782

QuickBooks 4.0

Customizable, easy-to-set-up small-business accounting program.
Intuit Inc.
800/813-8025
Street price: $99, CD-ROM version $129, Pro version on floppy or CD-ROM $189



BY THE BOOKS: Instant help in DacEasy Accounting & Payroll 95 guides new users on how to track customer records.

Savvy Statistics

If you work with sales figures, survey results, or other large sets of data, you need more than a spreadsheet to help you analyze and present your data accurately and easily. SPSS 7.0 for Windows fits the bill. Like its predecessors, SPSS 7.0 is easy enough for statistics newcomers but includes features that power users require. The biggest improvements include a much simplified interface, new features that make it easier to examine data, and preformatted graphics.

One of the best interface improvements I saw in a prerelease version is the new Navigator feature. It lets you look at multiple groups of data by opening and closing folders along the side of the screen. This saves you from scrolling through screens of data to locate the information you want. When you're ready to chart results, new time- and energy-saving preformatted table and chart templates look good enough for use in a presentation, and you can customize colors and fonts as you like. The program also supports Open Database Connectivity.

Power users may appreciate a new procedure for general linear modeling, new probability plots, and an improved summary procedure. SPSS 7.0 runs under either Windows 95 or Windows NT 3.5.1.

–Laurianne McLaughlin

SPSS 7.0 for Windows

The 32-bit version delivers a new interface and improved presentation tools.
SPSS Inc.
800/543-9262
List price: $695
Reader service no. 783

THE FIRST SOFTWARE THAT HARNESSES ALPHA WAVES TO FAX DIRECTLY INTO SOMEONE'S BRAIN.

(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...)

Designed for Microsoft® Windows®95

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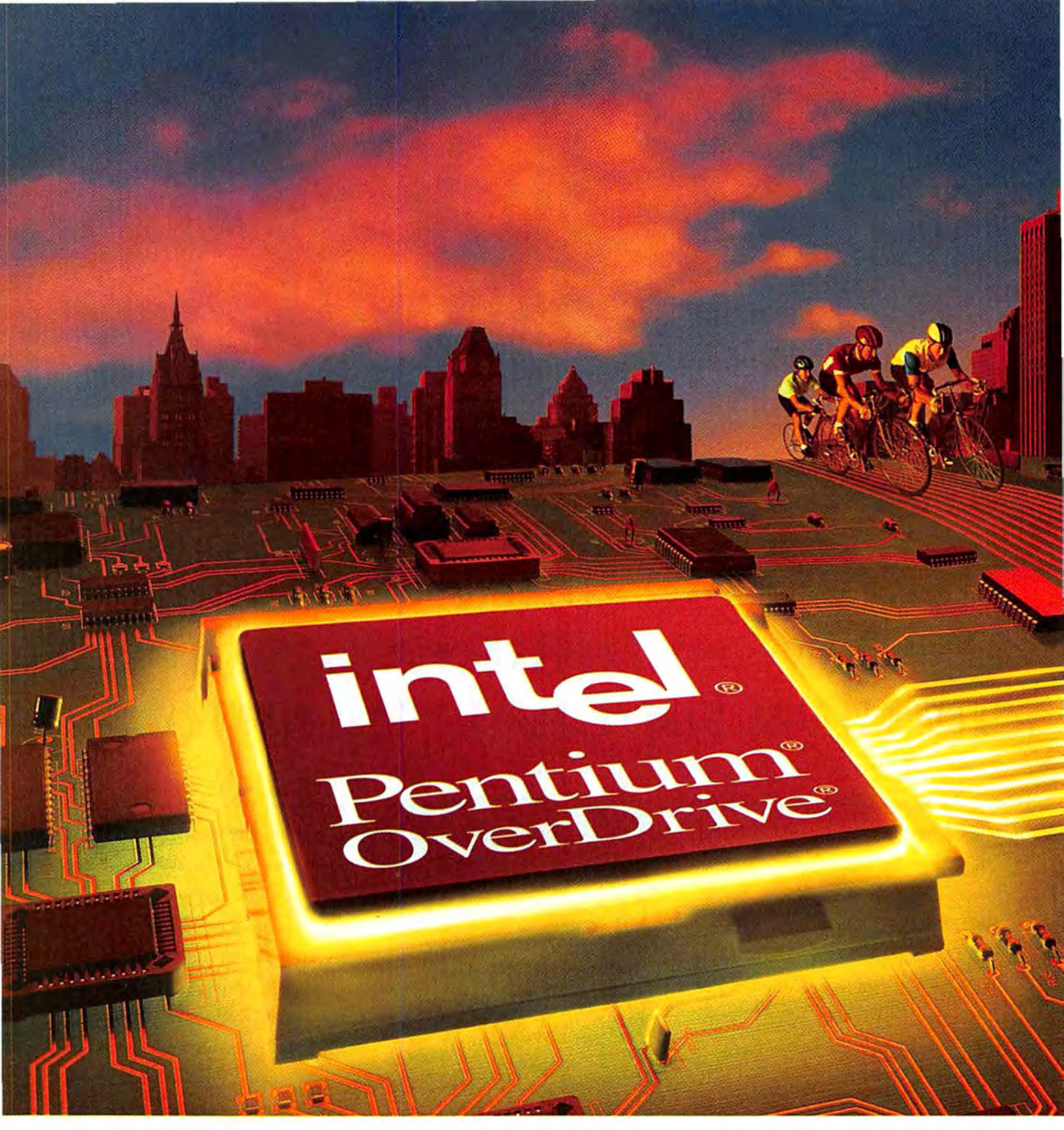

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As our fastest single-chip processor upgrade, the Pentium OverDrive processor is a very affordable way to upgrade many Intel486™ processor-based PCs.

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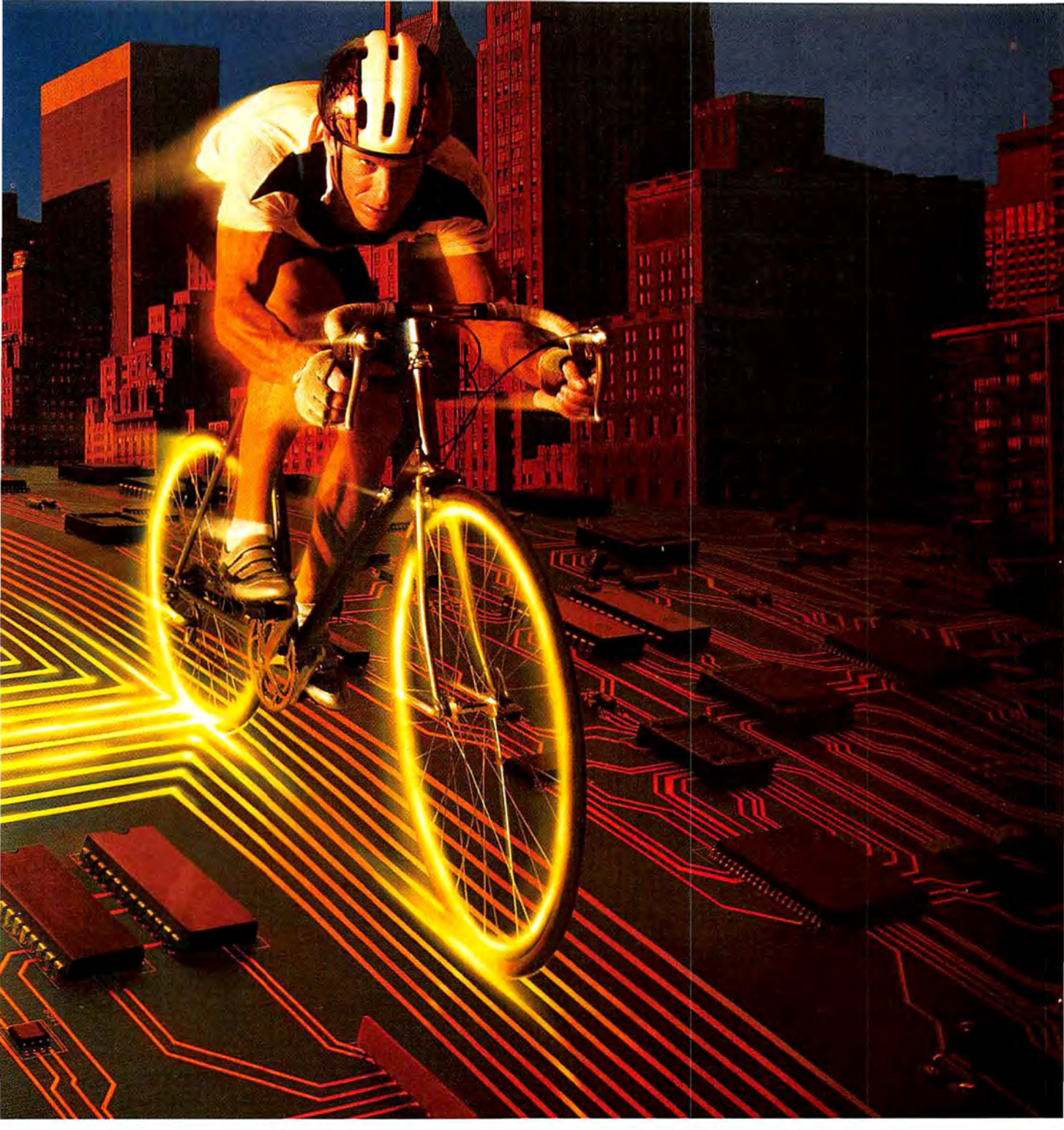
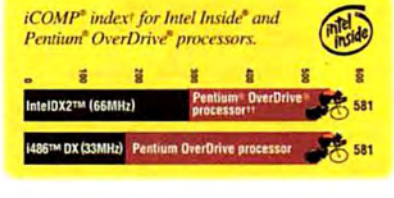


grade. Shift your PC into high gear.



For more information, contact your local PC dealer. Or you can dial our FaxBack* number at 1-800-525-3019, doc. #8739; call 1-800-538-3373, ext. 296; or visit our Web site at http://www.intel.com/procs/ovrdrive/ to learn more.

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†15% lower iCOMP index ratings when upgraded with the Pentium OverDrive processor. *Other trade names referenced are the property of their respective holders.

Project Manager Makes the Grade

Computer-assisted project management is not kid stuff. Project managers help you devise schedules, compare alternative scenarios, and communicate goals to fellow workers—but mastering their features takes time.

The latest upgrade of Primavera Systems' SureTrack Project Manager for Windows 3.1, version 1.5, is no exception. SureTrack is packed with a dizzying array of tools. But the program takes pains to make them more approachable.

The new SureTrack (I used a shipping version) has an impressive graphical interface. You can view, organize, sort, query, compare, and evaluate project data right on screen with the click of your mouse. The program is also flexible, allowing you to modify columns, bars, and other elements so you can view a project from different perspectives.

The upgrade adds features that the previous version sorely lacked. For example, you can now use the program to coordinate multiple projects. Tools let you link related projects, allocate personnel and other resources, and see the impact of new projects on other projects already under way.

To make the program's features more accessible, Primavera has included four Wizards. The most useful of these is the Activity Codes Wizard, which walks you through the process of assigning codes to project information so that you can later select, summarize, and prioritize it for analysis or for generating printed reports.

Still, to make full use of SureTrack, you have to know, or quickly learn, the meaning of such jargon as *critical path scheduling, negative float calculations,* and *resource leveling.* The program's animated tutorial is useful, and the online help and manual are both competent, but you'll still have to wade through jargon to accomplish your tasks.

Using the program efficiently requires 8MB of RAM. And though it works well with Windows 95, you'll have to wait until summer for the actual Windows 95 version.

SureTrack may not have all the project-tweaking tools of its $4000 sibling, Primavera Project Planner, nor does it offer Microsoft Project's automation features. But it's a good choice for team leaders who need sophisticated tools to manage small to medium-size projects.

—Reid Goldsborough

SureTrack Project Manager 1.5 for Windows 3.1

This flexible, graphical project manager takes time to master.
Primavera Systems
800/973-1335, 610/667-8600
Street price: $299
Reader service no. 784

Fantastic 4 From Fractal Design

Flip through any magazine, and you can see how a well-made graphic grabs your attention. Whether you're graphically inclined or are an interested novice, version 4 of Fractal Design's Painter can help you create compelling imagery for your work or play projects.

Quick on the heels of last spring's free 3.1 update, Painter 4 offers some cool new features that no other image editor or paint application has. For example, in the beta I examined, I used the new Mosaic brush to create tiled frescoes. Each sweep of this brush lays a row of tiles that can be erased, reshaped, and altered with a realism that would have wowed Michelangelo. Painter 4, which runs on either Windows 3.1 or Windows 95, also imports Adobe Illustrator PostScript objects into a separate floating layer, so they can be edited with Painter's new drawing tools, faded to semitransparent, or converted to a bit map.

MICHELANGELO'S ENVY: Painter 4 sports a cool new Mosaic tile brush and better menu organization.

Painter also lets you use floating image objects as active elements on a Web page. Just position an object where it looks best on the page, then type in a destination site. The Image Map can always be modified later in Painter.

The program's interface has the same feel as 3.1's but is better organized, with drop-down menus on each tool palette.

—John Goddard

Painter 4

New tools expand Painter's creative scope.
Fractal Design Corp.
800/297-2665
List price: $549, upgrade $129
Reader service no. 785

Connectix

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Circle 86 on reader service card

Customize and Enhance Your Windows 95 Desktop

Though Windows 95 has a better interface and more capabilities than Windows 3.1, there's no glossing over its flaws. For example, Explorer, Win 95's file manager, is clumsy to use and makes basic file manipulation a chore. MicroHelp's PowerDesk 1.0 includes utilities that address this and other shortcomings.

PowerDesk's slickest tool is ExplorerPlus, which replaces the Windows 95 Explorer (you have the option of leaving Explorer intact). ExplorerPlus includes a drive letter bar, a basic feature of Windows 3.1's File Manager that was omitted in Explorer. This simple menu bar lists available drives and makes it easy to jump between them. (Explorer makes you scroll around a window to locate all your drives.) ExplorerPlus includes other tools to make your life easier: A customizable toolbar lets you add icons for formatting and labeling disks, as well as for creating folders and shortcuts to program and data files. Other icons on the toolbar let you delete, rename, and move files with a single click.

ExplorerPlus sports a DOS command line and a tree-root selector that lets you easily choose your root directory. Features that weren't fully implemented in the beta release I looked at include tools for zipping and unzipping files.

PowerDesk comes with several other features that also enhance Windows 95. A system resource monitor will keep tabs on, for example, Windows resources, memory, and CPU activity. The System Access tool wasn't ready in this beta version, but it will give one-click access to functions such as shutdown and screen resolution, the company says.

–Joe Peschel

POWERDESK LETS YOU CREATE your own toolbars and enhances Windows 95's Explorer.

PowerDesk 1.0

A powerful file manager and other neat tricks for Windows 95.
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800/777-3322, 770/516-0899
Street price: $40
Reader service no. 786

A Financial Tool for Senior Managers

The need to constantly analyze company financial information never stops, and getting the right financial picture is essential. Business Matters' Cashé packs sophisticated forecasting and modeling tools into a flexible design that makes fiscal reporting and analysis faster than ever.

The usual weapon involved in financial modeling and business planning—complicated spreadsheet and database programming—is much slower than Cashé and requires complex, expensive customization. Cheaper alternatives, such as business planners (Jian's BizPlanBuilder is one example), provide useful templates for organizing and presenting a business plan but lack Cashé's financial underpinnings. For example, Cashé links spreadsheet financials to its chart of accounts. That lets you manipulate the data, not just view it.

After entering basic information about your business, you move through three main sections. The Scenario builder holds essential financial information, such as assets and liabilities. From there you move to the Assumptions page, where you enter sales and cost-of-goods projections. Finally, the Statements and Analysis section lets you create reports from any number of what-if scenarios. Unlike a spreadsheet, the Cashé screens provide detailed questions to guide your responses as you fill in the blanks.

After you enter your data, Cashé does the hard part: analyzing it according to your criteria. Several features, including automatic audit trails, the ability to import historical data, and the use of plain business terms, make Cashé faster and easier to use than spreadsheet models.

Cashé is not for everyone. A small-business owner probably doesn't need the kind of detail it supplies. And probably only senior management will understand the program's financial modeling techniques.

Cashé's hefty price may draw a double take, but timely and profitable decisions can make it worth every penny. The program is designed for Windows 3.1, but the shipping version ran fine under Windows 95.

–Peter Scisco

Cashé

Senior managers will appreciate Cashé's speed and depth of analysis.
Business Matters Inc.
800/993-3600
List price: $1995
Reader service no. 787

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If Quantex had been around back in Mona's day, she probably would have had a much bigger grin.

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Microsoft® Windows® 95

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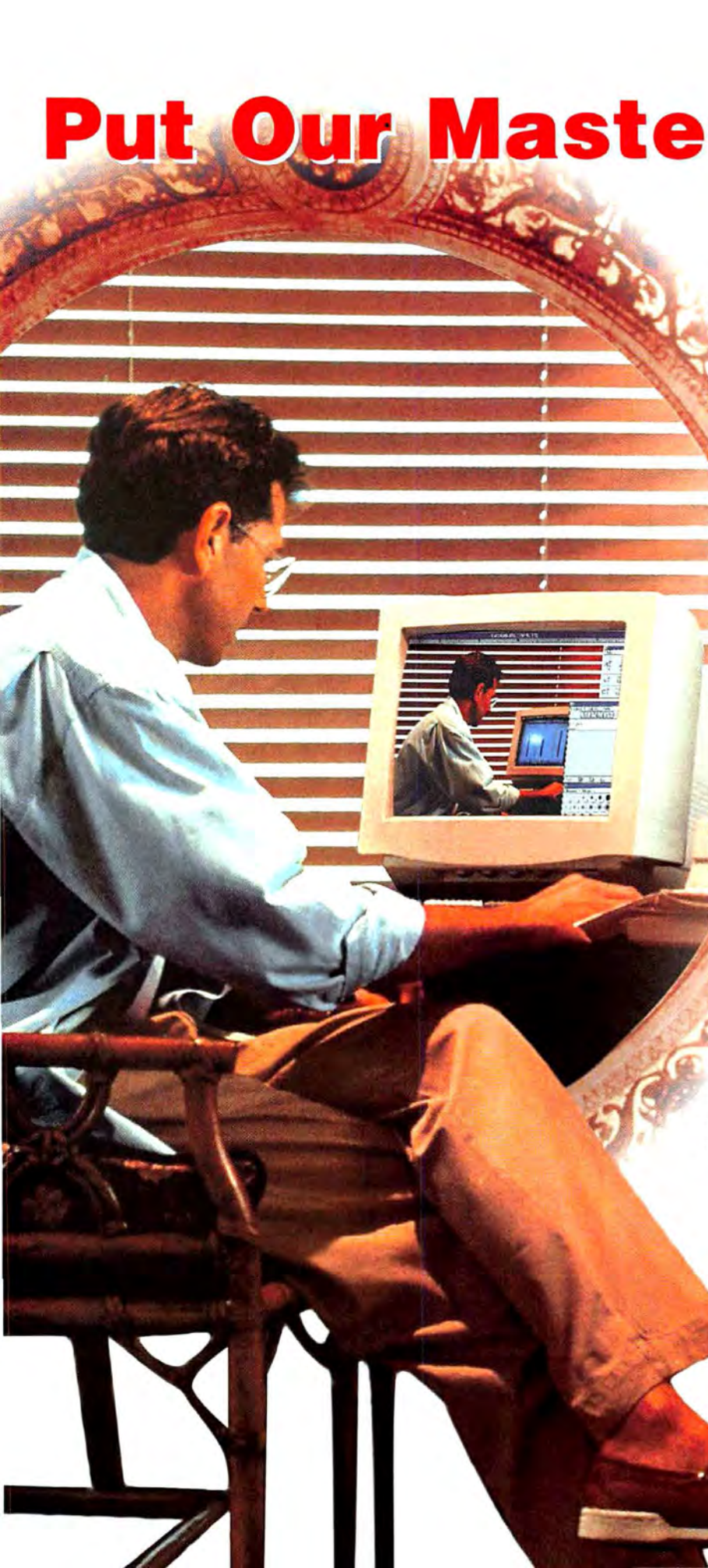

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To Work For You

Designed for Microsoft Windows 95

Start

All Quantex systems are not only equipped with Windows® 95 – they're *Designed for Windows 95*. As one of few companies to have passed strict Microsoft® Hardware Compatibility Testing, all of our systems are Plug and Play compliant to make adding new components a snap! For superior performance, check out these advanced components on our QP5/SM-2:

Performance-Enhanced Memory

Get extreme – our QP5/SM-2 features 16MB EDO RAM. The 16MB guarantees optimum software operation, while EDO boosts memory access speeds an additional 33%! Plus, we give you a 256KB L2 Pipelined Burst Cache for extra rendering power. Working together, EDO and the Pipelined Burst Cache cuts the processing time of memory operations, maximizing your system's execution rates to accomplish tasks faster.

Breakthrough Graphics and Media Acceleration

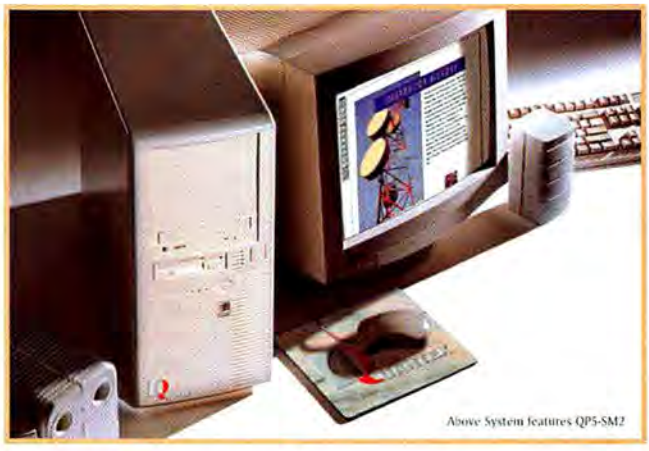
Enter the world of STB PowerGraph 64 Video Acceleration, the experts' choice for complete MPEG playback with full screen and full motion video. This high-performance 64-bit video graphics accelerator with 2MB EDO DRAM is based on the S3 TRIO64 V+ Chipset. That translates into no-holds-barred power, supporting up to 30 frames per second, resolutions up to 1280x1024, plus precise true color for photo-realistic imaging.

Massive Storage Power

An immense 2GB Mode 4 Hard Drive offers the capacity and performance you need to fully optimize Windows 95. In fact, it's the flat-out highest capacity ATA-2 Interface drive to date. Plus, its speedy 16.6 MB/sec data transfer rates, 5400 RPM, 256KB multisegmented cache buffer, and 10ms seek times deliver huge masses of data in a flash.

Digitally Controlled Color Monitors

The MAG 17" Color Monitor boasts complete Plug and Play support, a .26mm dot pitch for ultra-sharp display at 1280x1024 maximum resolution, rapid refresh rate, and a digitally controlled display. It's easy to see why MAG is the world's best selling 17-inch color monitor.



Above System features QP5-SM2

Multimedia That Will Move You

Quantex has teamed up with the multimedia hardware heavyweights to put together a system with premium stereo sound and image quality. Transport yourself to the world of multimedia with the ultra-fast, ultra-smooth MPEG performance of Aztech's 6X EIDE CD-ROM Drive, which boasts a 900 KB/S transfer rate and a 256KB buffer! Then, close your eyes and indulge in the crisp highs and solid bass of the Ensoniq Wavetable Sound Card and Altec Lansing speakers with subwoofer. It's top of the line multimedia at an affordable price, only from Quantex.

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At Quantex, we stand behind our products. We back up every system purchase with a 30-Day Money Back Guarantee and Toll-Free Technical Support. That's not all – we give you One Year Express Parts Replacement plus One Year On-Site Service. You even get the option to extend the protection of your system for up to 4 years with the GE Service Protection Plan.

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Family Software Bundle

- Novell PerfectHome: PerfectWorks; Memphis Math; Write With Me; InfoCentral; Grammatik; Clip Art for the Home; Clip Art for the Office; Read With Me 1 & 2; Hard Evidence; The Marilyn Monroe Files
- The 1995 Grolier Multimedia Encyclopedia
- Complete Reference Library (over 10 titles)
- Al Unser Arcade Racing
- USS Ticonderoga
- Animals II
- How Your Body Works
- Quicken Financial Manager-SE
- EveryWhere USA Travel Guide
- America Online, Prodigy CompuServe (one month trial membership to on-line services)
- NetCruiser Plus (Free Internet Access of over 400 hours for one month)

Professional Software Bundle

- Novell PerfectOffice: WordPerfect 6.1; Quattro Pro 6.0; Envoy; InfoCentral; Presentations GroupWise
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- Complete Reference Library (over 10 titles included)
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- Quicken Financial Manager-SE
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- Phone Disc Business '95
- Al Unser Arcade Racing
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- 17" .26dp MAG 1280x1024 Monitor
- 28,800 Baud V.34 Fax/Modem
- Aztech 6X EIDE CD-ROM Drive
- Ensoniq 16-Bit Wavetable Sound Card
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   Form #P-27.
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Purchase Amount:
   (Under $100 use corporate
   credit card)
   (From $100 to $999 use purchase
   order terms 2-10 Net 30)
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   purchase order terms Net 15)
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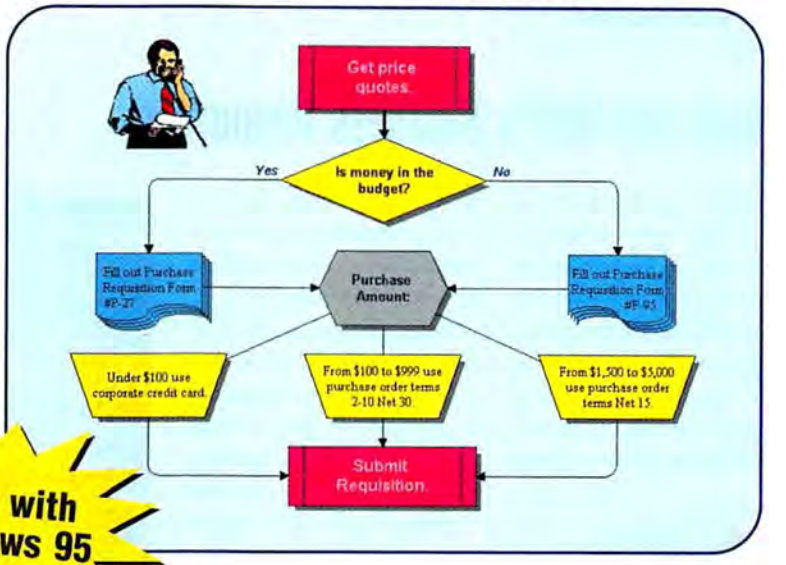

Runs with Windows 95

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Unlock the Web's Business Resources

Perhaps you've met that vacuum cleaner called the Internet. It sucks in hours of time as you search for information. Wouldn't it be great if someone scouted out helpful business resources and gave you a list of the sites? Internet: A Knowledge Odyssey, Business Edition does that and more. It teaches you how to use the Net to your advantage. I used a shipping copy.

Along with lessons, the CD-ROM lists World Wide Web sites: both business information sources and examples of companies selling on the Internet. To visit a site, just click on the address listed; the software launches your Web browser and brings you to the site.

Don't have Internet access? Try the included trial membership with America Online or trial account with Internet service provider PSI.

The Internet changes constantly, so MindQ also sells monthly updates ($29.95 per year or $9.95 per quarter) from the company's Web site (**http://www.mindq.com**). In addition, the company says it will send users updated CD-ROMs twice annually. This 16-bit program runs under Windows 3.1 and Windows 95.

–Richard Overton

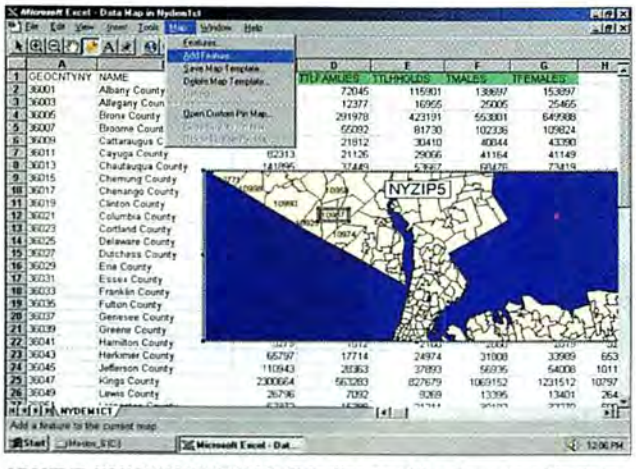
Internet: A Knowledge Odyssey, Business Edition

Lessons and pointers to business info on the Web.
MindQ Publishing
800/646-3008, 703/938-3579
List price: $59.95; monthly updates additional
Reader service no. 707

DON'T HAVE TIME TO WASTE ON THE WEB? Check out this disc's lessons and listings, geared for business.

Map It Up: Added Power for Excel 95

Sometimes a picture can be worth a thousand spreadsheets, even for my brother the accountant. That's why so many of you choose maps and charts to present the numbers in your spreadsheets. For users of Microsoft Office 95, MaconUSA has introduced a CD-ROM, Maps and Data for Office 95, that works with Excel 95's mapping features.



ADMIT IT, YOU WANT THE MAP: This disc provides demographic data, such as population numbers, and detailed maps for use with Excel 95.

The $99 disc delivers detailed U.S. and global maps, plus extensive demographic information. You can analyze Maps and Data's demographics for various projects—such as researching markets, looking for new business locations, or drawing up sales territories—then generate a map to present your results. Unfortunately, a manual was not ready to review, and no tutorial is included, so it's hard to judge how easy this disc will be for beginners to use.

The CD-ROM's maps cover the United States and most countries. Inside the U.S. state maps, you can drill down to zip code and county levels. There is information on major highways, waterways, airports, railroads, and landmarks. You'll also find 1995 demographic data, including ages, employment rates, education levels, incomes, and so forth.

I used a shipping copy of this program. MaconUSA says that by the time you read this the disc will be updated with more demographics.

–Laurianne McLaughlin

Maps and Data for Office 95

Detailed maps and demographic data; works with Excel 95's mapping features.
MaconUSA
617/254-2295
List price: $99
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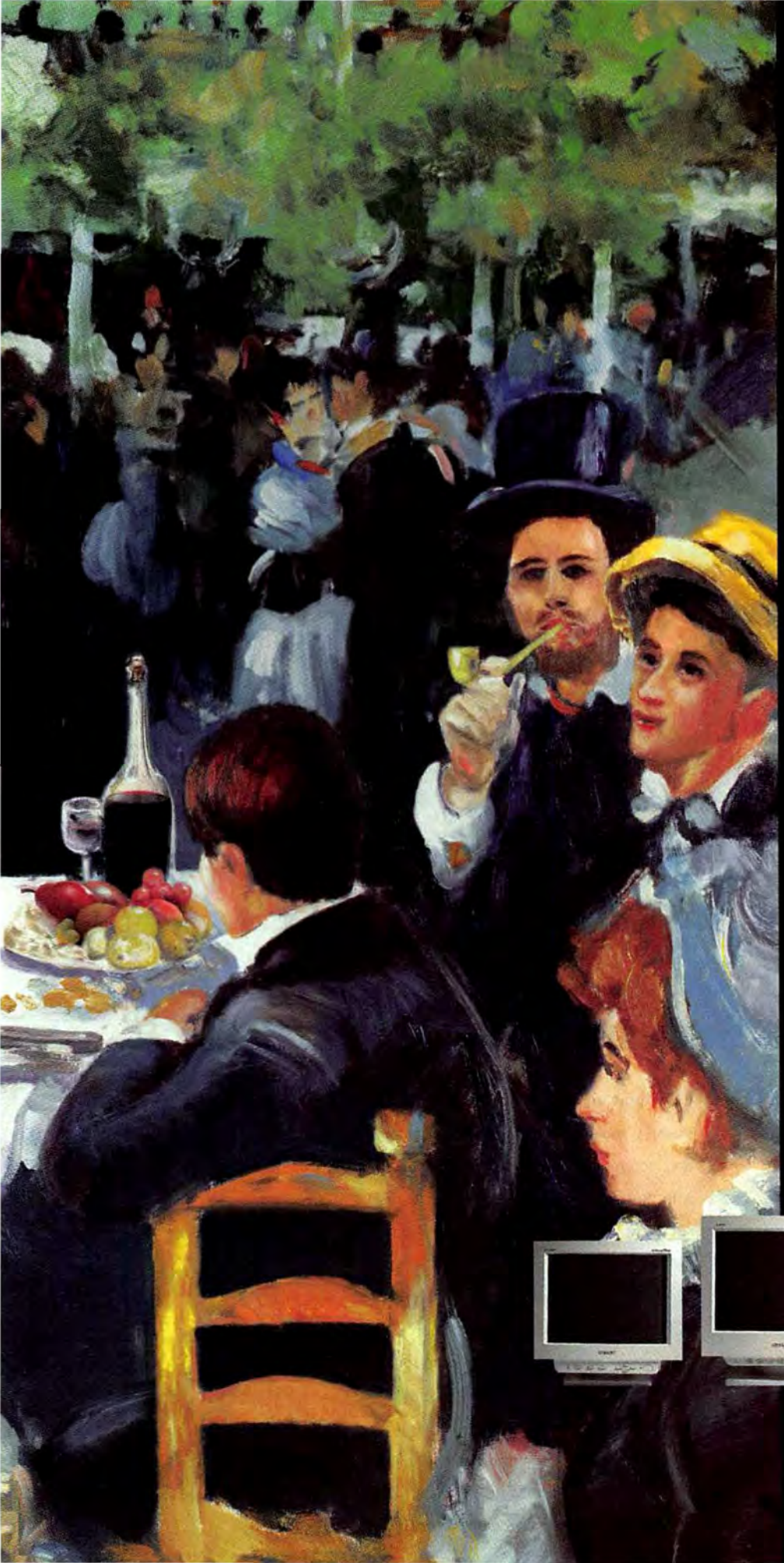

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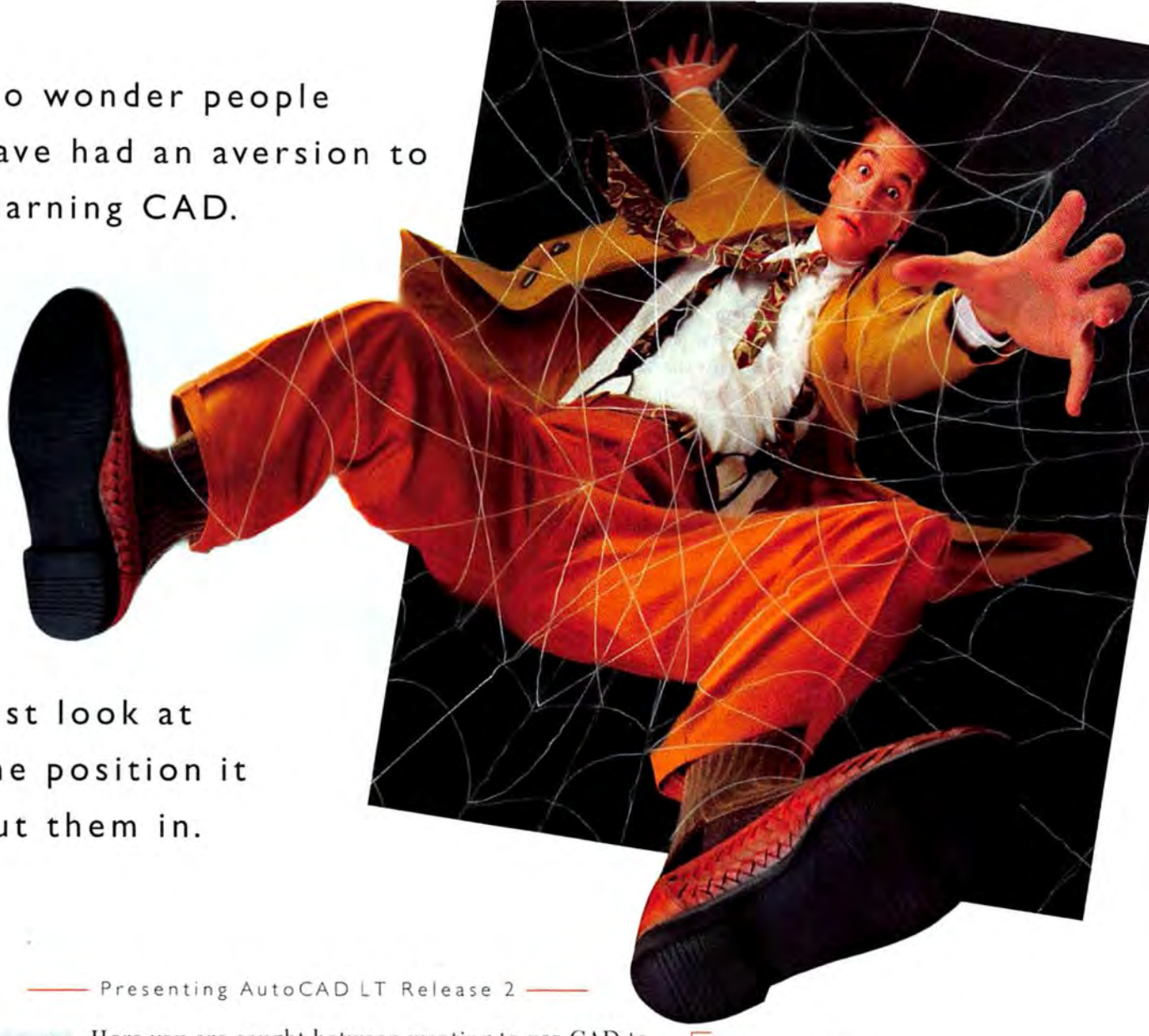
Compatible with Windows 95 and all previous versions of Windows.

Start

No wonder people have had an aversion to learning CAD.



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Two Better Ways to Tap Into Your LAN From the Road

Whether it's getting the latest sales figures, updating a database, or checking e-mail, the ability to connect to corporate resources while away from the office is more critical than ever.

Two new products can help: Citrix Systems' Winframe, which costs about $400 per user for a minimum of 15 users (a base cost of $5995); and Digital Equipment Corp.'s Mobilizer, which costs $299 per user with no minimum required. Both products are designed for enterprisewide installations; small office and home office folks are better off using the remote access tools built into Windows 95 or buying a remote control software package.

Winframe

Provides access to applications located on a LAN; uses minimal processing power.
Citrix Systems, Inc.
800/437-7503, 305/755-0559
http://www.citrix.com
List price: $5995 for minimum of 15 users, $1995 per 10 users thereafter
Reader service no. 748

Mobilizer

Retrieves e-mail and minimizes connect time by synchronizing local and corporate data.
Digital Equipment Corp.
800/344-4825, 508/486-2254
http://www.digital.com
List price: $299 per user, no minimum
Reader service no. 749

Winframe Runs Applications Remotely

Winframe is like remote control software on steroids. Part of it runs on a Microsoft Windows NT server, which is usually connected to the corporate LAN and is capable of serving multiple users simultaneously.

Another part of Winframe lets you run Windows 3.*x*, Windows 95, or Windows NT applications remotely on a PC—even a 386SX DOS machine with 2MB of RAM, the vendor claims. This can mean new life for old hardware: You just need to add a modem (9600 bits per second or faster) or a LAN connection. The trick is that the Winframe server does all the heavy processing.

The Winframe software you use on your remote PC is available in 16-bit versions for DOS and Windows 3.*x*, and in a 32-bit version for Windows 95 and Windows NT. And it is fast. Using the Win 95 client from my office, I dialed in to a Winframe demo server at Citrix at 14.4 kbps. I experienced few delays; it was almost as fast as using Windows on a local PC.

The downside is that Winframe requires big-ticket server hardware. You'll need at least a Pentium-100 with 32MB of RAM and a large and fast SCSI hard disk. And setting up the server software is something best left to a network manager.

Mobilizer: For Data and E-Mail

Digital's Mobilizer uses a different paradigm. It runs on your local PC and is designed to save connection time and phone costs by letting you work while you're not connected to the LAN. Unlike Winframe, Mobilizer focuses on providing access to data and e-mail rather than applications.

DIGITAL'S MOBILIZER offers quick-connect mobile access to corporate data, but setting it up can be time-consuming.

Here's how it works. Say you're in your office using your notebook connected to the LAN. The notebook is loaded with Mobilizer and a local copy of Microsoft Access that you're using to massage data located on the network server. When you disconnect your notebook from the LAN, you can still work on that data: Mobilizer has copied the data, creating its own copy of the network drive.

And when you dial in to the LAN from the road, Mobilizer does a two-way transfer, sending your changes to the server and then copying the updated version of the data—which may include changes from other users of that file—onto your notebook's hard drive. Mobilizer performs this type of synchronization for any specified files located on the corporate LAN, and also retrieves e-mail for you to read offline.

You'll still need a server back in the office that's set up for remote access, but Mobilizer isn't as picky as Winframe. It works with Microsoft's RAS (remote access server), which is available for Windows for Workgroups or Windows NT, or with the Dial-Up Adapter software that comes with Windows 95. I looked at a Windows 3.1 version of Mobilizer, but it will be superseded by a Windows 95 version that was not available for review.

Both products have tradeoffs. Winframe allows tight control and security, but server hardware costs and toll-call charges can add up fast. Mobilizer uses your existing server hardware and can save you telephone charges, since you'll do most of your work offline. Mobilizer is complex to set up, and this is usually a job for a system administrator. It also lacks the raw speed and immediate access to corporate data that Winframe offers.

—Stan Miastkowski

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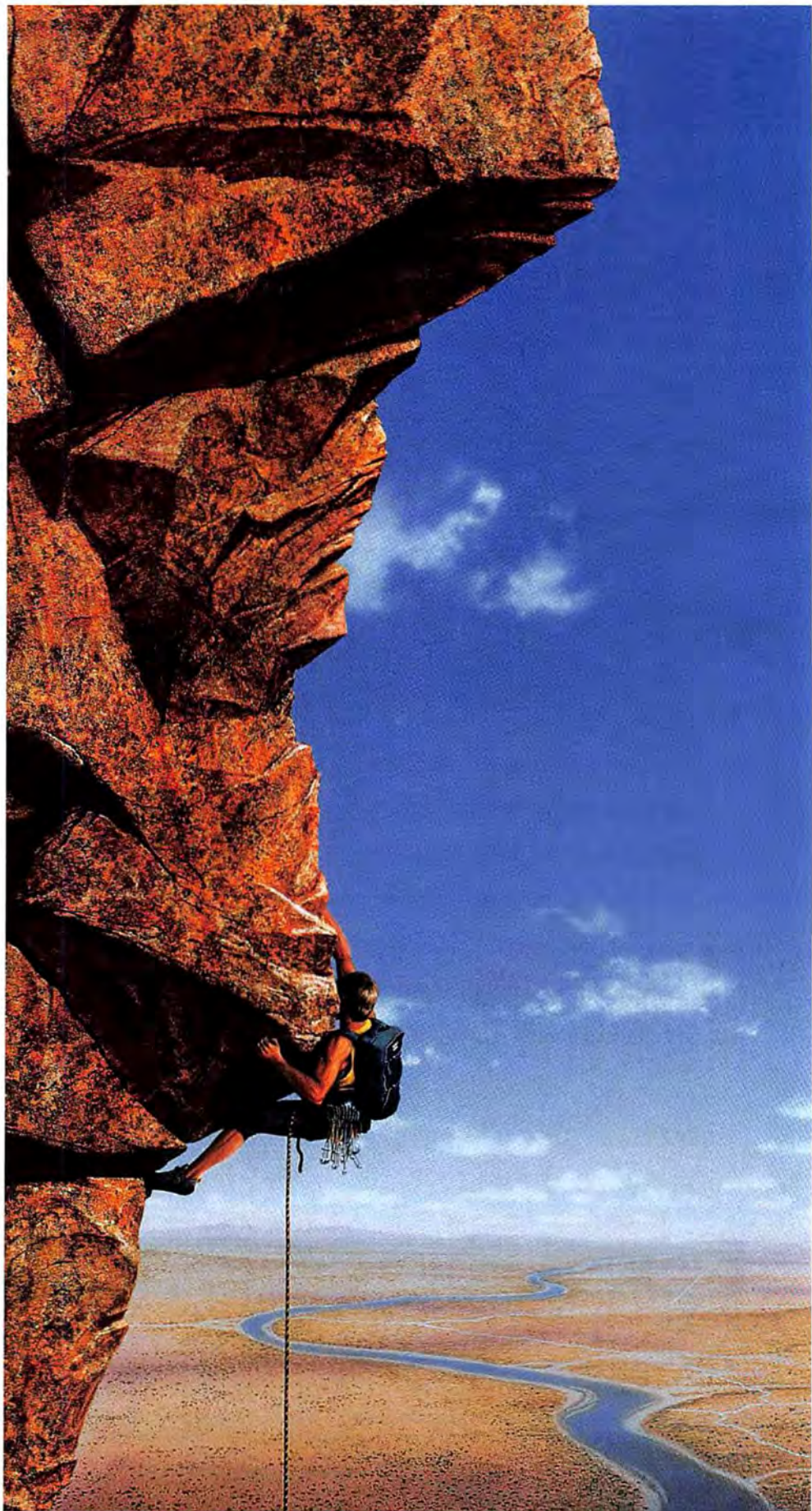

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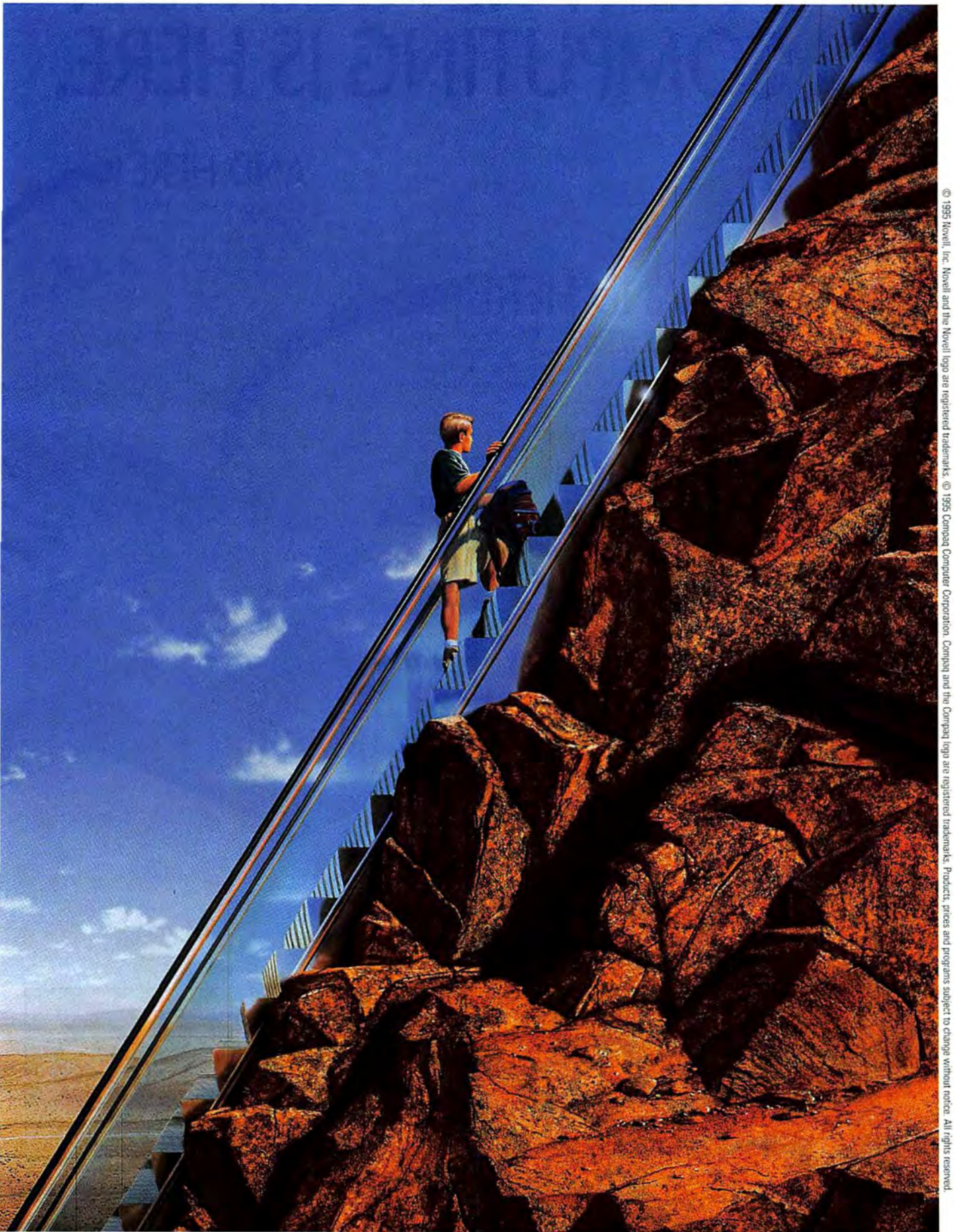

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Designed for Microsoft® Windows®95

intel inside pentium® PROCESSOR

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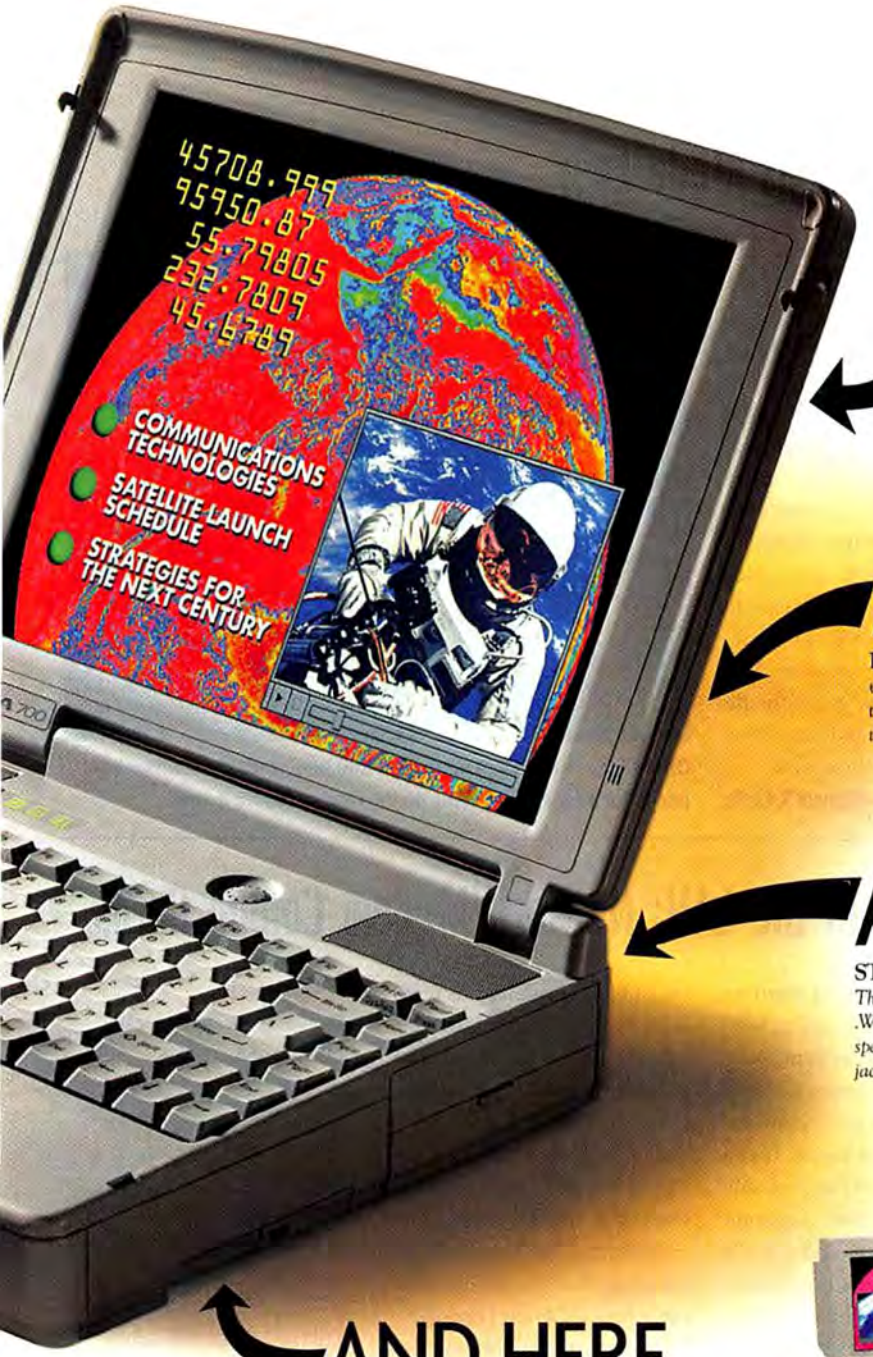

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On-the-Road Modem Connections Made Easy

It's the same old story at just about every hotel I stay in. I have to hunt for a telephone outlet for my notebook PC's modem. I usually find one behind the bed—the most remote, inaccessible part of the room. Or I unplug the telephone cord from the phone and insert it directly into my modem jack, which prevents me from receiving any phone calls. True, more inns are providing data ports for business travelers, but they are still the exception to the rule.

Now I can avoid repeating the Great Telephone Outlet Hunt with the Modem Mate MPA-100, TT Systems' simple and so-obvious-why-didn't-I-think-of-that device. About the size of a pack of cigarettes, the Modem Mate connects any data or fax modem to virtually any telephone. Simply plug the Modem Mate into the phone's handset jack, then plug the telephone's handset and your notebook's modem into the Modem Mate. Modem Mate lets you connect both the telephone and your modem to one phone line, without needing to search for a telephone jack.

Modem Mate features a user-adjustable control that provides the right signal match between the modem and telephone. It balances the modem's signal to the phone line so you get a solid data connection. Modem Mate is powered by two 9-volt batteries, which unfortunately are not included. The device has other conveniences, such as a battery power indicator, volume control, and a switch to alternate between modem and voice calls. It also includes a cassette recorder connector so you can tape phone conversations. Modem Mate now goes on the road with me—and stays busy in my home office as well.

—Michael S. Lasky

Modem Mate MPA-100

Portable device allows one telephone line to be used for modem and voice calls.

TT Systems Corp.
914/968-2100
List price: $120
Reader service no. 750

CHAT LINE: The Modem Mate MPA-100 plugs into the handset of a phone for easy modem setup on the road or in your home.

New Lay of the LAN: Network/Modem Combo Cards

Modern day road warriors do more computing from the field than from an office. Their notebooks are their main PCs. And telecommunications is second nature. If you fit this profile, you've probably been using two separate cards—a modem and a LAN adapter—in your notebook's PC Card slot. The latest PC Card trend unites both functions in one combination card.

The most common card includes a 10Base-T ethernet adapter and a 14.4- or 28.8-kbps fax-modem. Xircom, for example, provides a 28.8 modem in its $467 CreditCard Ethernet+Modem 28.8. Higher-end cards are also available: Motorola adds wireless capabilities in its Mariner. The $549 Mariner card includes one- and two-way paging support and direct cellular phone connection.

Should you buy one of these cards? Combination cards need only one slot, making them a natural choice for single-slot portables, such as subnotebooks or PDAs. They're also attractive if you have a two-slot PC. A combo card not only frees up a slot, it lets you avoid conflicts that can pop up when installing modem and ethernet cards from different vendors.

On the other hand, single-function cards let you buy modem and LAN functions from preferred vendors and upgrade them independently. Also, a combination card may not include all the special features found in a single-function card. While individual LAN and modem cards each have integrated jacks, combo cards usually sacrifice a jack and require a dongle for the modem. The first crop of cards won't give you a price break, either. At $480, the Megahertz XJEM3288, for example, is about $50 more than it would cost to buy separate cards.

—Bryan Hastings

Dual-purpose cards for the road warrior.

Mariner

Motorola, Inc.
800/427-2642
Street price: $549
Reader service no. 751

CreditCard Ethernet+Modem 28.8

Xircom Inc.
800/438-4526
Street price: $467
Reader service no. 752

Megahertz XJEM3288

Megahertz
800/527-8677
Street price: $480
Reader service no. 753

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BYTE/NSTL LAB REPORT June 1995
BEST OVERALL

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EDITORS' HOME OFFICE COMPUTING PICK

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ProClass 288 MT V.34

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HOME OFFICE COMPUTING Jan. 1995
EDITORS PICK AWARD

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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 I/S BRAND PREFERENCE

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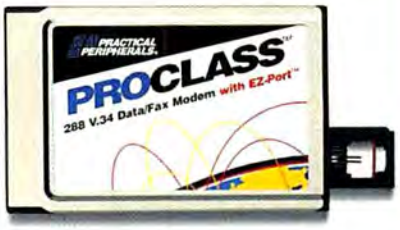

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PC WEEK April 3, 1995
ANALYST CHOICE

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All six years of it.

It goes into the bank and gets processed into the system.

Along with 123,441 other transactions.

Will it be handled with the same accuracy as a million-dollar deposit?

Absolutely. The bank has an account with OS/2.

Can your software do this?

No bank could ever survive by offering accuracy for "most" of their transactions. That's why 20 of the top 30 banks depend on OS/2® to run many of their computer systems.

It gives them the reliable, 32-bit foundation they need to build a distributed information system. As well as the perfect environment for applications that are so vital they can't go down for even a second.

It also lets them bring all of their offices and banking systems together on one common platform.

Virtually every computer in the company, from notebooks to desktops and servers, can take full advantage of OS/2 – ensuring seamless communications throughout the enterprise.

OS/2 has delivered Crash Protection™ and true

OS/2 Warp Connect Fullpack is available from IBM for $189 by calling 1 800 IBM-3333, ext. EA115. In Canada, please call 1 800 IBM CALL, ext. 1290. Reseller prices may vary. The IBM home page is located at http://www.ibm.com.
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multitasking (allowing a wide range of bank services to be processed simultaneously) since 1992. And as more companies come to depend on networked environments, OS/2's strengths are helping them succeed.

But banks aren't the only ones who are using it. OS/2 (along with its latest release, OS/2 Warp Connect) is hard at work every day in insurance companies, fast-food checkout systems, automated teller machines and airline reservations—businesses where downtime due to a computer system error is simply not an option.

Give us a call at 1 800 IBM-3333, ext. EA115, or visit our Web site at http://www. software.ibm.com for all of the details. We'll provide information that your company can really bank on.

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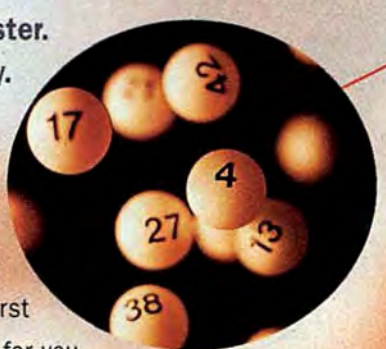
to see answers where others only see numbers

Introducing new Microsoft Excel for Windows 95.

Now you can see numbers from any angle. List them, chart them, sort them in ways that simplify analysis, that reveal the answers you need. With new Microsoft® Excel, you can use AutoCalculate to find the sum, average, count, minimums, or maximums of specific cells simply by highlighting them. (You no longer create scratch formulas every time you need an answer.) To spot geographically based trends and relationships, use the new mapping capabilities of Microsoft Excel to analyze sales by territory, for example. PivotTable® views let you rearrange the headings inside your spreadsheet to get a new view of your data. If you want to view revenues by product instead of by region, simply move the "product" heading and the entire table adjusts. And for people who value the different perspectives different people can offer, Microsoft Excel now lets multiple users enter and edit data in the same worksheet at the same time.

Everything from recalculations to pivot tables is faster. Routine tasks now happen automatically.



Answers appear in record time because formula recalculation, charting, cutting, pasting, and database operations are faster than ever. Up to 70% faster. And now that the software can sense what you are doing and complete the process for you, fewer steps are required to complete a task. AutoComplete, for example, speeds data entry by recognizing the first few letters of a repetitive entry and automatically finishing the word for you. Using the Template Wizard can help you get a head start on your work by turning existing spreadsheets into templates and by setting up an automated system to track important fields in a separate database. Nothing slows you down, not even questions. To find out the best, quickest way to do something, you ask the Answer Wizard. "How do I get this page to print sideways?" Type in the question and the Answer Wizard will show you how.

Microsoft

WHERE DO YOU WANT TO GO TODAY?™

Designed for Microsoft Windows 95

To see an autodemo and more, go to http://www.microsoft.com/msoffice. Or call 800-426-9400.

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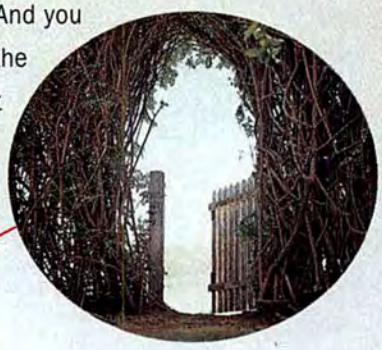
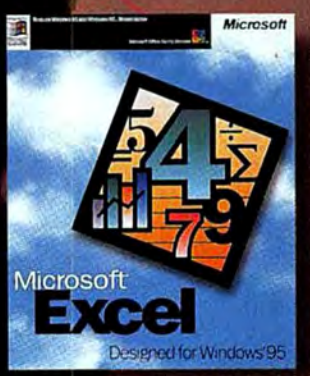
The walls are now down between applications. It's easier to share data across applications.

By improving integration with Microsoft Access, you can now share tools across both applications. You can borrow Access Forms and Reports to simplify data entry, and to create group reports and mailing labels from your Microsoft Excel list. You can use PivotTables in Access to see data from different angles. Choose the Convert to Access command, and the software will automatically turn spreadsheets into true relational databases. It eliminates the guess work by creating the relational tables for you. And you can move or copy data effortlessly across worksheets and workbooks, to the desktop, or to other apps by using advanced drag and drop tools. New Microsoft Excel. Now it works the way you want to work, at the speed you want to work.





Now you can take full advantage of Windows 95.

New Microsoft Excel is designed to work hand-in-hand with the 32-bit performance, advanced multitasking, and simplified user interface of the Windows® 95 operating system. To integrate seamlessly with the Microsoft Office suite of applications for Windows 95. Together, they make computing fundamentally easier. They make it easier for you to focus on your work, not on your software.

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.

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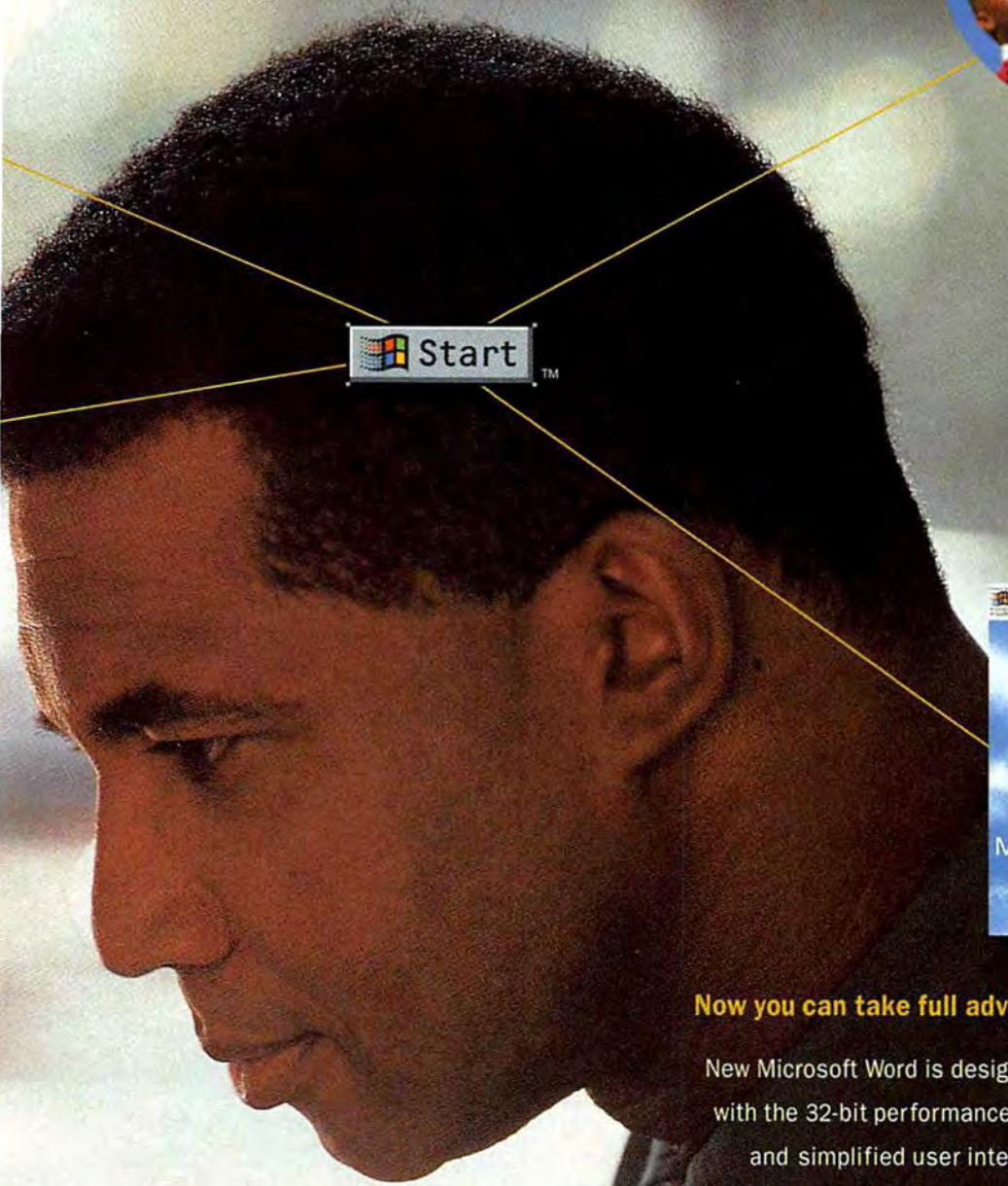
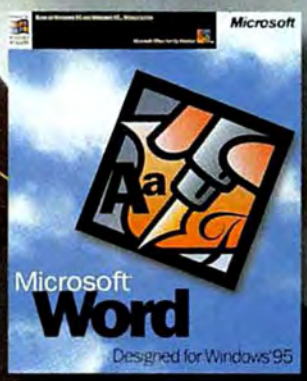
Share your words on paper, in e-mail, over the Internet, or wherever your ideas need to be seen.

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.



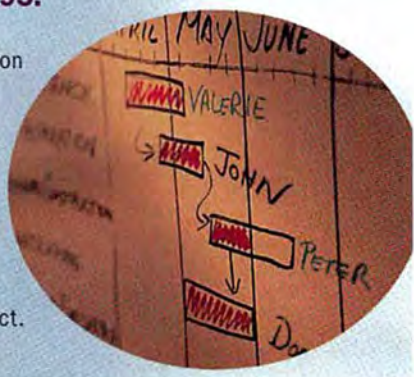


Now you can take full advantage of Windows 95.

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 guide
your project down a clear path

Introducing new Microsoft Project for Windows 95.



Now you can manage projects more simply, more smoothly, by communicating project information as it occurs. With new Microsoft® Project you can convey project status quickly and effectively so your boss, customers, and coworkers are always in the loop. From sharing task deadlines and responsibilities, to letting people know about changes and the impact they'll have on the deadline, you have the tools to organize your projects into manageable steps and keep them moving in the right direction. New Microsoft Project unlocks the doors of communication and gives you the power to navigate the most efficient route to a successful end product.

Graphical views let teammates visualize where the project is going.

With Microsoft Project you can display project data in ways that everyone can understand. Great-looking Gantt Charts integrate text, timelines and graphical bars so everyone can see start and finish dates, interdependencies and task assignments. Throughout your project, you can also use a Monthly Calendar report to share your plan in a format that's clear and easy to read. And since Microsoft Project shares many of the same key commands with other Office applications, it will be easy to create schedules and reports. But if at any time you need help, type in a question and the Answer Wizard gives you the information you need. Microsoft Project helps you illustrate every phase of your project so you and your team keep your goals in sight.

Microsoft

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Keep everyone moving on the same track with open lines of communication.

Microsoft Project is completely integrated with a wide range of e-mail systems* and Schedule+ so that with a single click, changes and additions are immediately distributed to and from teammates. Assignments, task changes, and progress can be communicated and updated without ever reentering information, so you save time and eliminate mistakes. And because Microsoft Project is a member of the Office family, sharing data between programs is easy. For example, you can start building a schedule by simply dragging a task list out of Microsoft Excel and dropping it directly into your Microsoft Project plan. You keep communication clear and information consistent and your project continues to move exactly the way you planned.

Now you can take full advantage of Windows 95.

Microsoft Project is the world's best selling project management software and now is optimized to work hand-in-hand with the 32-bit performance, advanced multitasking, and simplified user interface of the Windows® 95 operating system. Together, they help open the lines of communication. Together, they help you enhance the way you manage your projects.

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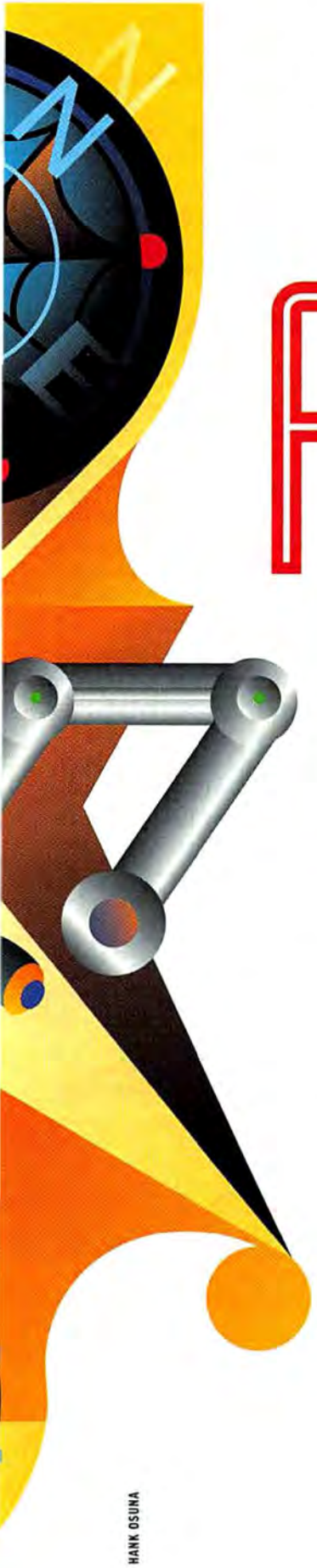

HANK OSUNA

Special Report: INTERNET

It's a big, bad cybersphere out there.
How do you get what you need?
Try one of these search tools.

Find It on the Net

The Net may be the coolest thing since Pop Rocks, but it's also completely confusing: In a world where the Charles Schwab mutual fund database is just a mouse click or two away from the Church of Satan sign-up sheet, it's all too easy to lose your bearings. You know there's valuable information out there. The question is, how do you find it?

The problem with searching for information on the Internet is twofold. First, there's too much of it. You've got the *World Wide Web* (the interconnected system of sites and their pages—over 7 million at last count—that you access with a browser like Mosaic or Netscape Navigator), *Gopher* and *FTP* sites (for finding and downloading files), and zillions of subject-specific *newsgroups* and *mailing lists*. Second, all this stuff is utterly unorganized: There's no centralized catalog of its resources, no single place you can go to find what you need.

By Richard Scoville

On the Internet, fortunately where there's a need, there's an eager programmer—or, increasingly, an entrepreneur—waiting to fill it. And some very bright folks have set up World Wide Web sites that help you zero in on the information you need. We took a critical look at their offerings to find out which of these tools are best at helping you find what you're looking for quickly and easily.

Just Browsing: Directories

Directory	Address
Clearinghouse for Subject-Oriented Internet Resource Guides	http://www.lib.umich.edu/chhome.html
Galaxy	http://galaxy.einet.net/
The Global On-Line Directory	http://www.gold.net/gold/
McKinley Group's Magellan	http://www.mckinley.com/
NetCenter	http://www.netcenter.com/netcentr/whats-new/whats-new.html
Point Communications	http://www.pointcom.com/
Pointers to Pointers	http://www.homecom.com/global/pointers.html
Starting Point	http://www.stpt.com/util/submit.html
Web Voyager	http://webspace.com/~wvoyager/
The Whole Internet Catalog	http://nearnet.gnn.com/wic/index.html
Yahoo	http://www.yahoo.com/
Yellow Pages.com	http://theyellowpages.com/feedback.htm

Directory Assistance

One type of page—a *directory*—is great if you're simply interested in a general topic—the Civil War, say, or online finance—and want to find some relevant spots on the Net. Directories contain lists of such sites, organized by topic. Our favorite is Yahoo (**http://www.yahoo.com/**). It lists some 80,000 Net sites (including Web pages, Gophers, FTP sites, and Usenet newsgroups), divided among 14 top-level categories—Arts, Computers, Health, Recreation, and so on. Click on one and you get a list of subtopics. Keep drilling down until you find the stuff you want.

In addition to general-interest directories like Yahoo (see "Just Browsing: Directories"), subject-specific directories cover everything from Antiques to Youth Workers. The best way to find one of these specialized directories is to check the Clearinghouse for Subject-Oriented Internet Resource Guides at the University of Michigan (**http://www.lib.umich.edu/chhome.html**).

Needle in a Haystack

While directories are helpful when you're trying to find out what the Web has to offer, they become less so as your questions become more specific. To find answers to such questions, you need a *search engine*. These are Web pages containing forms into which you type a text string you want to search for. Click a button, wait a bit, and the engine spits out a list of Web sites that match your search criteria. In a recent sweep of the Web, we found some 60 such pages, 10 of which we'd consider useful tools (see "Index to the Net: Search Engines"); the rest are either moribund or of interest only to computer science grad students.

Behind every search engine stands a database, in which are collected the *URLs* (Universal Resource Locators, or specially formatted Internet addresses) of Web pages and other Net resources. Most of these databases are created by *crawlers* (also

Index to the Net: Search Engines

● = Yes ○ = No n/a = not available

Engine	Address	Number of indexed pages
Aliweb	http://web.nexor.co.uk/public/aliweb/aliweb.html	9000
CUI's W3 Catalog	http://cuiwww.unige.ch/w3catalog	n/a [1]
Excite NetSearch	http://www.excite.com/	1,500,000
InfoSeek	http://www.infoseek.com/	400,000
Lycos	http://lycos.cs.cmu.edu/	1,500,000
New Riders' Official World Wide Web Yellow Pages	http://www.mcp.com/newriders/wwwyp/index.html	17,000
Nikos	http://www.rns.com/cgi-bin/nikos	n/a
Open Text Index	http://www.opentext.com:8080/	1,300,000
WebCrawler	http://webcrawler.com/	190,000
World Wide Web Worm	http://www.cs.colorado.edu/home/mcbryan/WWWW.html	250,000

[1] Combines databases from other search engines.

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A search engine's database is simply an index of words and phrases associated with URLs. Your job is to come up with words that match this index. Here are a few general rules of thumb that will maximize your success.

Read the instructions.

Most search engines provide their own set of operators, delimiters, and rules to help you search efficiently. Use them!

Choose the unusual word.

The more distinctive a word, the more useful it

YAHOO CATEGORIZES WEB SITES, dividing them into 14 main topics and hundreds of subtopics.

known as *robots* or *spiders*), software programs that roam the Web, looking for new sites by following links from page to page. When a spider finds a new page, it adds it to the database.

These databases store anywhere from a few thousand to over a million Web pages; the leading engines add new pages daily. Of the major general-interest engines, Lycos and Excite have the broadest coverage—at press time, these two databases each claimed 1.5 million fully indexed Web pages—followed closely by Open Text Index, which claimed 1.3 million.

The size of an engine's database has a big impact on the success of your search. For example, we queried each engine with the string *recipe wheat beer* (don't ask; we were thirsty). The massive Lycos database gave us 437 *hits* (matched pages) in return. InfoSeek and Open Text Index gave us around 200 each; others, less than 100. In several cases, we didn't get any hits at all. Generally, the smaller the database, the fewer hits we received.

Most engines restrict themselves to indexing the Web itself. InfoSeek and Excite go a few steps further than the rest by also indexing Usenet newsgroups. For a fee, Infoseek will also let you search a bunch of handy non-Internet databases.

It's All in the Index

Web spiders do more than just collect URLs. They also collect information about each page. The search engine's back-end software uses this information to create an index, which is what you're actually searching when you submit a query. Not surprisingly, indexing techniques vary from engine to engine.

Every engine indexes a page's URL and title. Most also index the headers that start each section. Others record the most frequently mentioned words or the first few lines of text. Open Text Index actually indexes every word on the page—including words like *the* and *and* that other engines ignore. As a result, it was the only engine that re-

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will be for sharpening your search. For instance, you'll get a more targeted search with *cercopithecus aethiops* than with *African green monkey*. And try to pick words that really define your idea: Our homebrew query didn't really fizz until we thought to include the word *recipe*.

Watch your spelling.

If your search query asks for "astronut," you'll get Web pages for the orthographically challenged. By

continued

Net resources included	Searches for		Operators		Ranks hits by relevancy	Displays what it actually searched for
	Whole words and phrases	Wild cards (regular expression)	Boolean	Proximal (near, following)		
World Wide Web	●	●	○	○	●	●
World Wide Web	●	●	○	○	○	●
World Wide Web, Usenet newsgroups	●	○	○	○	●	●
World Wide Web, Usenet newsgroups, non-Internet databases	●	○	●	●	●	●
World Wide Web	●	○	●	○	●	●
World Wide Web	○	○	○	○	●	●
World Wide Web	○	○	○	○	●	●
World Wide Web	●	○	●	●	●	●
World Wide Web	○	○	●	○	●	●
World Wide Web	○	○	●	○	●	●

search TIPS

the same token, remember to search for legitimate variations: if you're looking for *fly-fishing* try *flyfishing*, and *fly fishing* as well.

Think about synonyms.

Remember that you're probably searching for a concept, not just a word. If you're looking for backpacking sites, include the terms *hiking*, *trekking*, *backpacking*, and *camping* in your query.

Forget natural language.

Some sites support *natural language* queries, which let you ask questions the way you would in conversation. Don't. Instead, focus on the key terms and phrases that identify your concept, then enter them as a list.

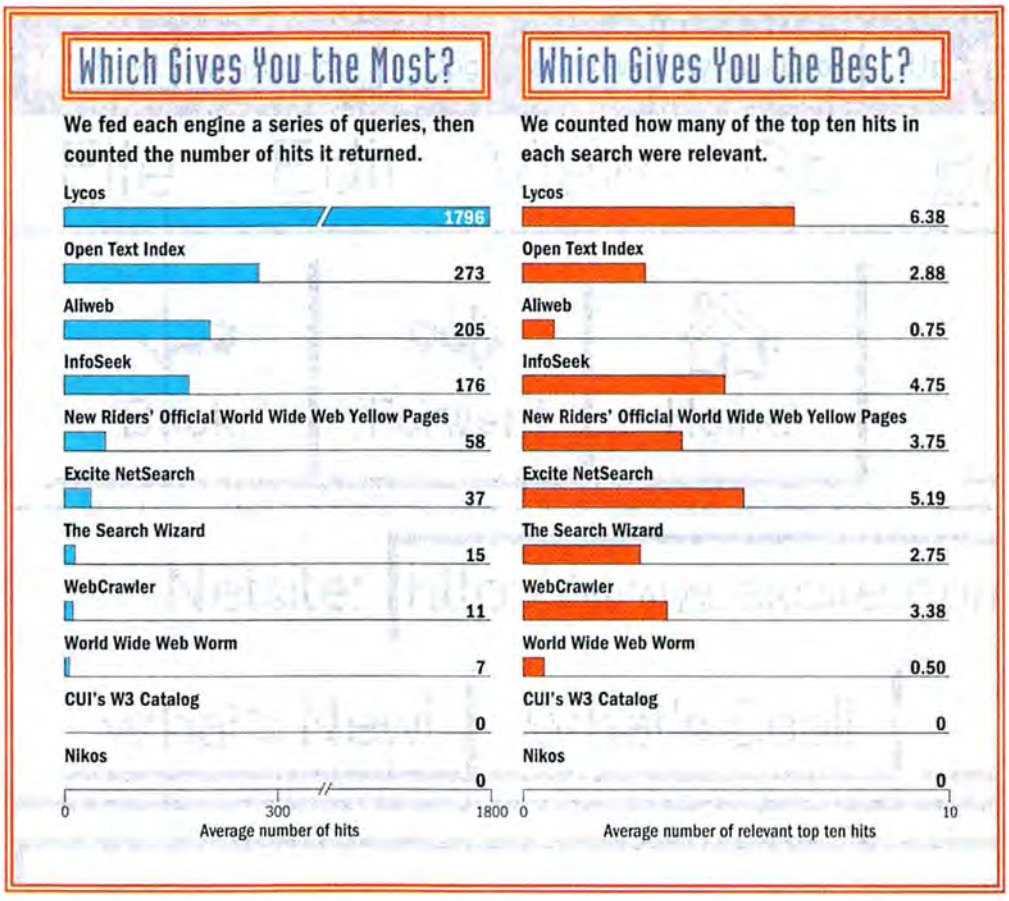
Repeat yourself.

After the first pass, go to some of the most promising-looking hits, and jot down other terms that you can use to sharpen or widen your search.

Don't forget about NOT.

Some search engines support the NOT operator, which lets you exclude terms. Thus, with a search like *metal NOT heavy NOT*

continued



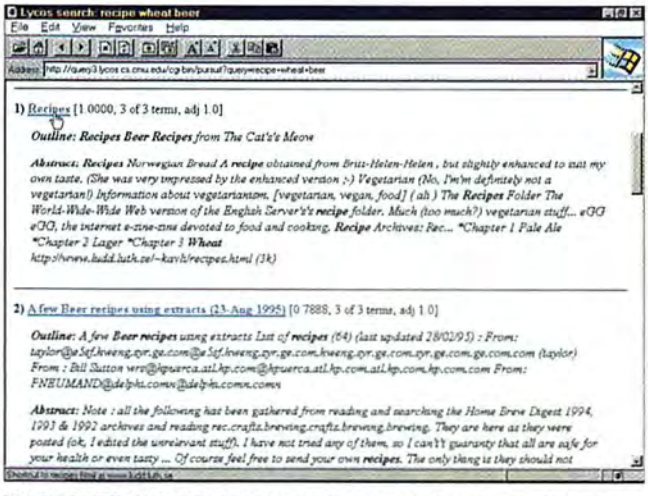
turned any hits on the query *to be or not to be* (granted, some of these were odd matches—the first hit was a Welsh language primer—but hit number ten (**http://tecc.co.uk/public/ewan/docs/hamlet**) was indeed the text of the play.) Excite's *concept-based* indexing can find relevant pages even if they don't contain your specific keywords.

While the size of the database determines the number of hits it delivers, the quality of the indexing is a major factor in determining how many of those hits are relevant to your search. For example, we ran the query *real estate North Carolina Triangle* through each search engine, then counted the number of hits that actually had something to do with finding real estate in the Chapel Hill area. WebCrawler returned 19 hits—compared with the more than 200 hits we got from InfoSeek. But 9 of those 19 were exactly on target. Most of InfoSeek's hits related to real estate, but many had nothing to do with North Carolina.

The Right Tools for the Job

No matter how big the database, or how sophisticated the indexing, a search engine is only as good as the query you give it.

Sometimes it's just a matter of phrasing (see "Search Tips"). For example, the query *homebrew wheat beer* wasn't nearly as successful at finding beer recipes as *recipe wheat beer*. Not all engines



LYCOS GIVES YOU SUBSTANTIAL SUMMARIES of each page it finds, making it easier to identify pages that are actually relevant.

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treat your phrases the same way. InfoSeek "stems" words, seeking matches with parts of the whole: Ask for *impressionism*, for example, and you'll also get matches for *impression*. Lycos, on the other hand, treats your search term as a stem—so the word *metal* matches *metallic*.

Several engines let you search for whole phrases—instead of just searching for the individual words in your query string, they look for occurrences of them together. A couple—Aliweb (**http://web.nexor.co.uk/public/aliweb/aliweb.html**) and CUI's W3 Catalog (**http://cuiwww.unige.ch/w3catalog**)—let you use wild cards (* and ?) to find variations on a phrase.

INFOSEEK SEARCHES MORE THAN THE WEB: It also indexes Usenet newsgroups and several non-Internet databases.

In other cases, it's a question of using the available tools. Some engines let you refine your queries with special operators. At the most basic level, this means you can, as with Lycos, search for sites that contain either *any* or *all* of your search terms. Others let you use more formal Boolean terms—AND, OR, and sometimes NOT. InfoSeek and Open Text Index are the only engines that give you *proximal* operators, which let you search for terms that appear near or next to each other.

Using all the tools available can increase the quality of hits dramatically. For example, when we ran that *recipe wheat beer* query past Open Text Index's "Simple" search page, we got 90 hits, few of which had anything to do with brewing wheat beer (most were concerned with *drinking* it). But when we switched to the "Power" page and ran the query *recipe (near) wheat (followed by) beer*, we got six hits, three of which were exactly on target.

Wheat and Chaff

Your search has only begun when you receive your list of hits: You still have to sort through all those sites to find the ones you really want. Most engines help you by showing you, at the top of the

music **you can hit sites dealing with industrial metals and avoid those devoted to heavy metal bands.**

Use more than one search engine. We found surprisingly little overlap in the results from a single query performed on several different search engines. So to make sure that you've got the best results, be

continued

One-Stop Shopping: Metasearch Engines

Engines	Address	Engines and directories included
All-in-One Search Page	http://www.albany.net/~wcross/all1srch.html	Aliweb, CUI's W3 Catalog, Galaxy, Harvest, InfoSeek, JumpStation, Lycos, Nikos, Open Text Index, SavvySearch, The Search Wizard, WebCrawler, World Wide Web Worm, Yahoo
CUSI	http://web.nexor.co.uk/susi/cusi.html	Aliweb, CUI's W3 Catalog, Galaxy, Harvest, InfoSeek, JumpStation, Lycos, Open Text Index, WebCrawler, Yahoo
Fun City Web Search	http://www.funcity.com/search.html	Aliweb, CUI's W3 Catalog, Galaxy, Harvest, InfoSeek, JumpStation, Lycos, Nikos, Open Text Index, SavvySearch, The Search Wizard, WebCrawler, World Wide Web Worm, Yahoo
HyperNews	http://union.ncsa.uiuc.edu/HyperNews/get/www/searching.html	Aliweb, ArchiePlex, CUI's W3 Catalog, Dejanews, Galaxy, InfoSeek, JumpStation, Lycos, Nikos, Open Text Index, SavvySearch, WebCrawler, World Wide Web Worm, Yahoo
InfoMarket	http://www.infomkt.ibm.com/	McKinley Directory, Open Text Index, Usenet newsgroups, Yahoo
The Internet Sleuth	http://www.intbc.com/sleuth/sleuth.html	Dejanews, Lycos, Yahoo
LinkSearch	http://where.com/ls/LinkSearch.html	Aliweb, CUI's W3 Catalog, Galaxy, InfoSeek, Lycos, Nikos, Open Text Index, Point, WebCrawler, Yahoo
MetaCrawler	http://www.cs.washington.edu/research/projects/ai/metacrawler/www/home.html	Galaxy, InfoSeek, Lycos, Open Text Index, WebCrawler
SavvySearch	http://www.cs.colostate.edu/~dreiling/smartform.html	ArchiePlex, Dejanews, Galaxy, Harvest, InfoSeek, Lycos, Nikos, WebCrawler, Yahoo
Searchers	http://gagme.wwa.com/~boba/search.html	ArchiePlex, Galaxy, JumpStation, Lycos, WebCrawler, The Whole Internet Catalog
W3 Search Engines	http://cuiwww.unige.ch/meta-index.html	Aliweb, ArchiePlex, CUI's W3 Catalog, Galaxy, JumpStation, Lycos, Nikos, WebCrawler, The Whole Internet Catalog, World Wide Web Worm
Web-Search	http://www.biddeford.com:80/~soaring/	Galaxy, InfoSeek, Lycos, New Riders' Official World Wide Web Yellow Pages, Nikos, Open Text Index, Point, SavvySearch, WebCrawler, The Whole Internet Catalog, Yahoo

search TIPS

sure to try your search with numerous sites.

Try specialized sites:

If you're looking for a specific company's Web page, try the Open Market's Commercial Sites Index (http://www.directory.net/). Similarly, if you're looking for government-sponsored Web sites, check out Infomine (http://lib-www.ucr.edu/Main.html). If you want to search Usenet newsgroups, you can use InfoSeek or DejaNews (http://www.dejanews.com/). Finally, if you're looking for downloadable files on the Internet, ArchiePlex (http://flosun.salk.edu/archieplex.html) should be able to help.

results page, the words they actually searched for: You might have asked for *The Good, the Bad, and the Ugly*, but the search engine will tell you it actually looked for *Good*, *Bad*, and *Ugly*. Remember, you can tell many search engines to look for whole phrases instead of just keywords.

Most engines return hits in order of relevancy. That way, even if you get 200-plus hits, you don't have to worry about wading through all 200 of them—the top 10 will probably do. Different search engines use different methods to calculate relevancy—InfoSeek ranks hits according to how frequently your search terms appear in the page relative to their frequency in the entire database; Lycos ranks them based on the number of terms found on the page, their proximity to one another, and their position on the page.

Most engines also give you some kind of description of the hits. Lycos does this best, giving you a relevancy rating, a page description, and a brief abstract of its text. Read the abstract, and you'll have a good idea whether that hit's what you're looking for.

Metasearching

You don't feel like hopping from one search engine to another to find what you want? Then you should check out a *metasearch* site (see "Metasearch Engines"). These are pages from which you can use several search engines to launch queries.

Two of these pages—Savvy Search (**http://www.cs.colostate.edu/~dreiling/smartform.html**) and MetaCrawler (**http://www.cs.washington.edu/research/projects/al/metacrawler/www/home.html**)—launch your query to several engines at the same time (including most of the engines we looked at individually). Savvy Search also covers ArchiePlex (for searching FTP sites) and DejaNews (for searching newsgroups). The only problem with these parallel searchers is that you don't get full access to each engine's query tools—the Boolean and proximity operators, for example—so your searches will be less accurate than if you used the real thing.

Other metasearch sites let you search the major engines one at a time. You fill in the form for the engine you want to use and send it off. Again, you lose some query tools, but these pages can be handy to keep on file for quick queries.

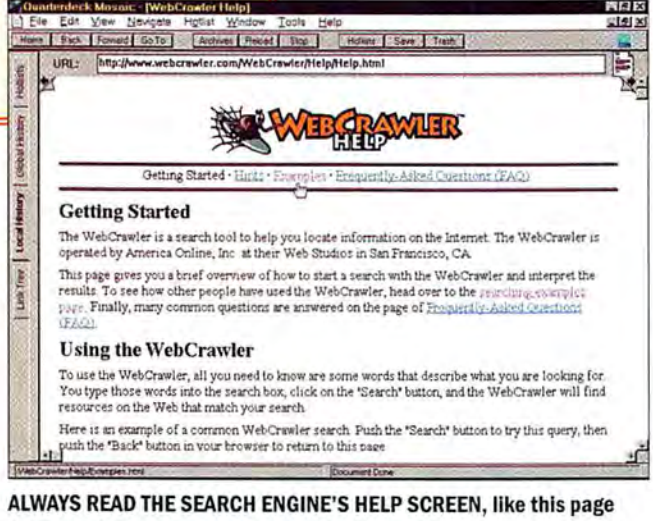
Still Surfin' After All These Queries

So which of these tools should you add to your list of favorites? We'd pick three search engines: Excite, Infoseek, and Lycos. All three give accurate results from easy-to-use interfaces. We'd also add one directory: Yahoo. It's the most complete directory we found, and it makes an excellent default home page.

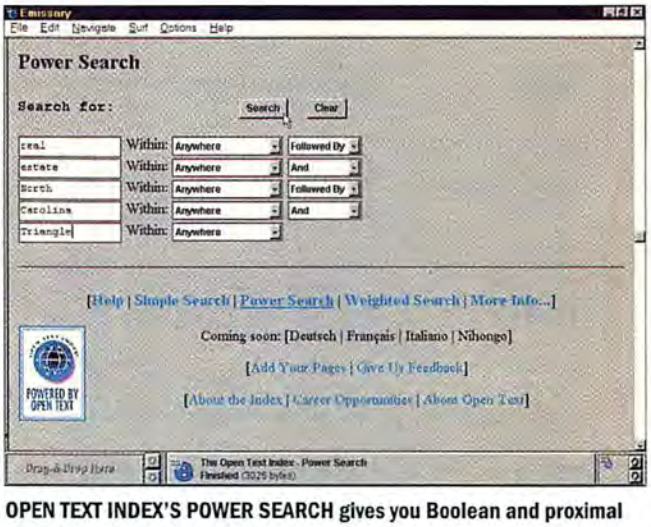
Fortunately, these tools are constantly evolving. InfoSeek has announced plans to incorporate a directory into its search site. And Open Text Index has announced plans to team up with Yahoo to form what could be a formidable combination.

But no matter which of them you end up using, these tools make the Web more than a playground for propeller heads: They make it a place where serious people can do real work—which is exactly what we're going to do as soon as we check out that recipe for Peach Wheat Ale and visit a couple of houses near Raleigh.

Richard Scoville is a contributing editor for PC World *and a software training consultant in Chapel Hill, North Carolina. Thanks to slip.net of San Francisco for Internet services.*



ALWAYS READ THE SEARCH ENGINE'S HELP SCREEN, like this page from WebCrawler, before you perform a search.



OPEN TEXT INDEX'S POWER SEARCH gives you Boolean and proximal operators for refining your queries.

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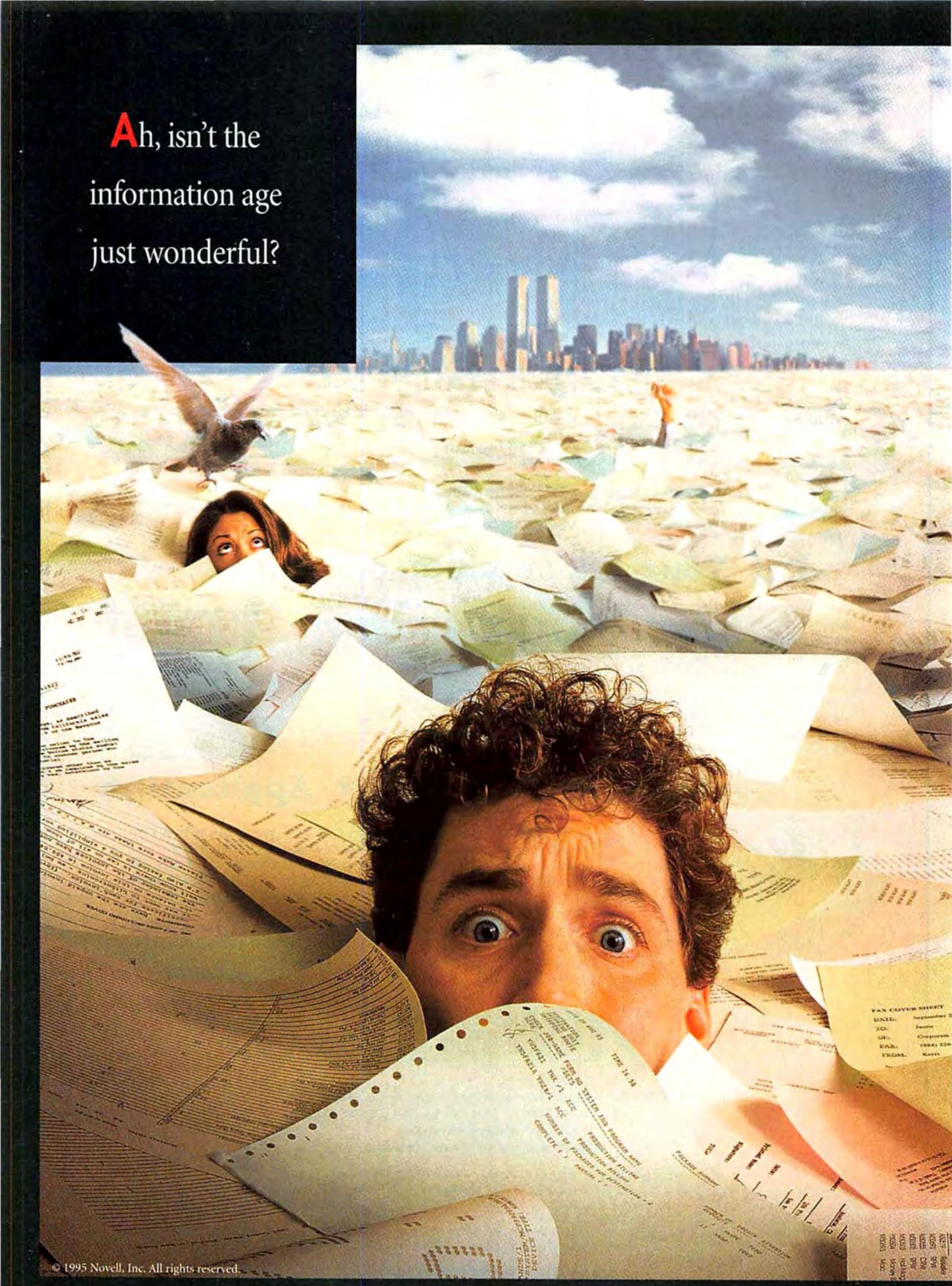
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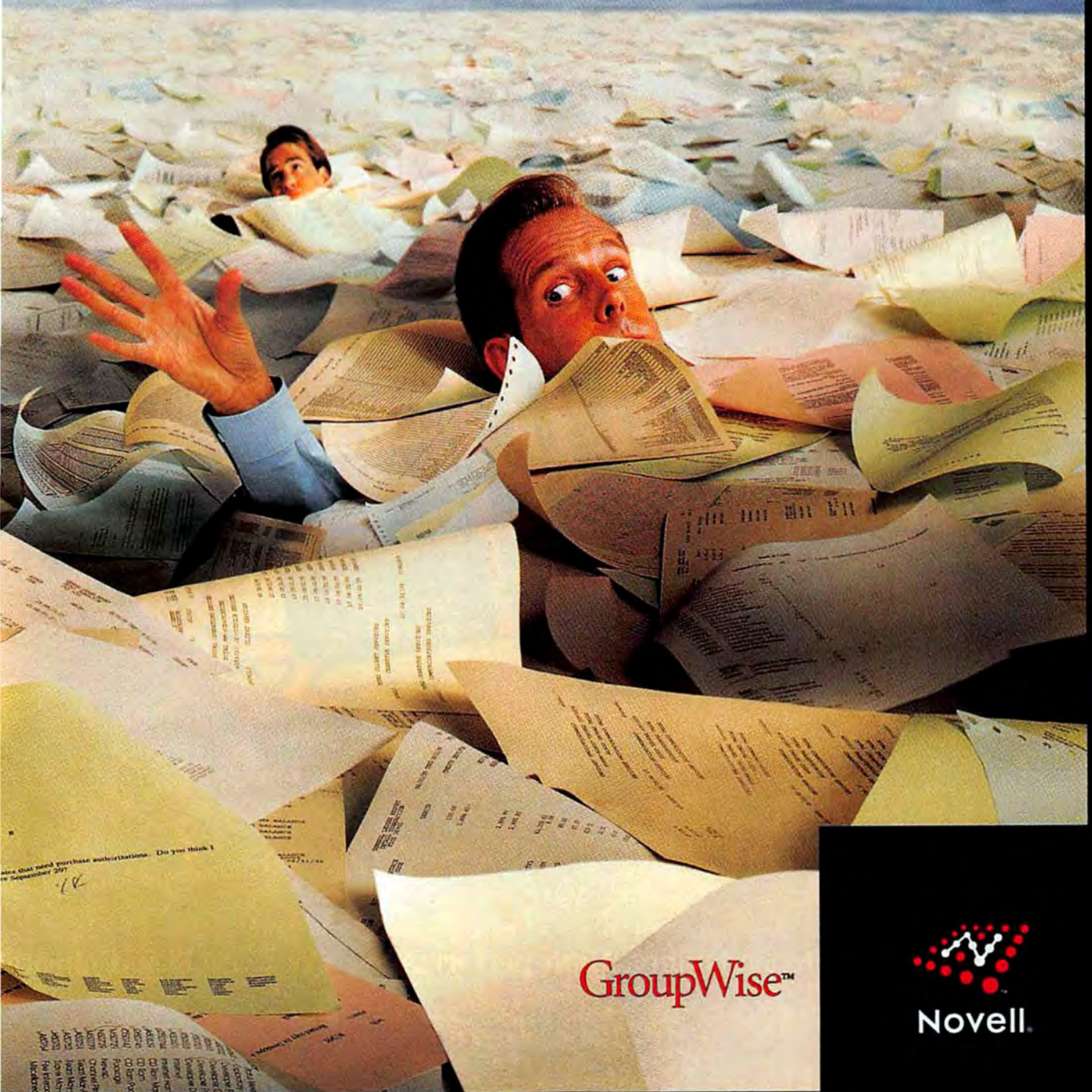

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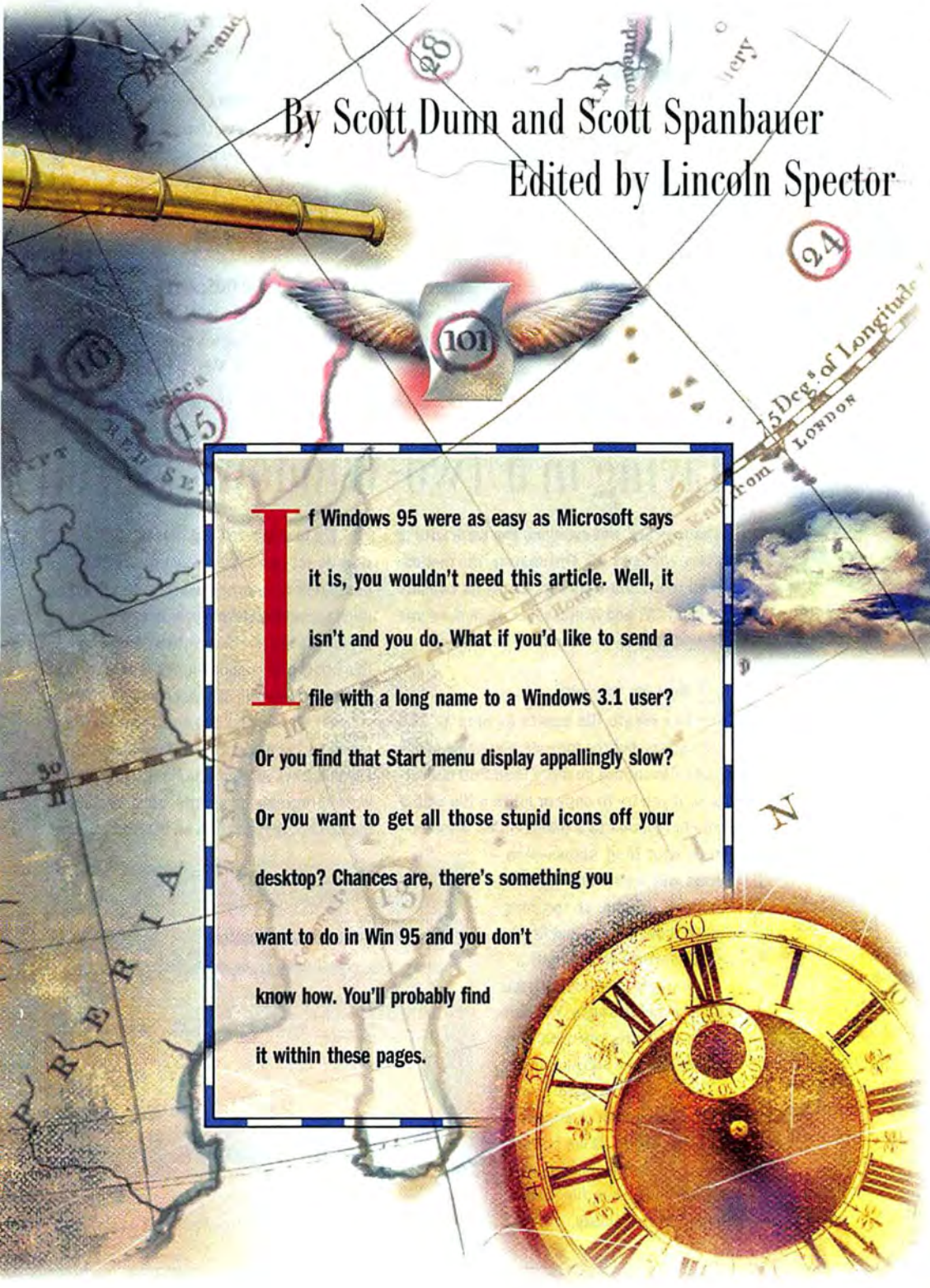
95 Essential Tips

for Windows 95

By Scott Dunn and Scott Spanbauer
Edited by Lincoln Spector



If Windows 95 were as easy as Microsoft says it is, you wouldn't need this article. Well, it isn't and you do. What if you'd like to send a file with a long name to a Windows 3.1 user? Or you find that Start menu display appallingly slow? Or you want to get all those stupid icons off your desktop? Chances are, there's something you want to do in Win 95 and you don't know how. You'll probably find it within these pages.

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Finding Your Way

1 Your Favorite Way to Browse

What happens if you double-click a folder inside a standard, single-pane folder window (the kind you get when you double-click *My Computer*)? Most likely, the folder you've clicked will open up in a separate window.

If you'd rather have the current window change to show the contents of the new folder, select *View•Options* from any folder window and click the *Folders* tab. Click *Browse folders by using a single window that changes as you open each folder*, then click *OK*. This will change not only the current folder but also your default.

2 Override Your Browse Mode

Whether you use single-window or multiple-windows mode (as set in View•Options' Folders tab) to browse single-pane folder windows, you can choose the alternative view whenever you open a folder. Just hold down **<Ctrl>** as you double-click a folder or drive icon. If your options are set for a single window, a new window will open; and if your options are set for multiple windows, the current window will show the desired folder's contents.

3 Getting to Explorer, Part I

In addition to opening standard folder windows, you can also use Windows 95's Explorer to view folders and the files within them. An Explorer window is a standard folder window with an extra pane on the left that contains a tree diagram of your drives and folders (what DOS and Windows 3.*x* used to call *directories*). You can launch Explorer by clicking the *Start* button and selecting *Programs•Windows Explorer*.

4 Getting to Explorer, Part II

If your mouse cursor is at the top of the screen rather than the bottom, you don't have to drag it all the way to the bottom to start Explorer. Just click *My Computer*, then hold down **<Shift>** as you double-click it.

5 Getting to Explorer, Part III

There's another way to launch Explorer: From a standard, single-pane folder window. Just select the folder you want to explore, then hold down **<Shift>** as you double-click it. An Explorer window will open up.

6 Make Explorer the Default

If you prefer Explorer to standard folder windows, select *View•Options* from within either window. Click the *File Types* tab. Select the *Folder* file type (not to be confused with the File Folder type) and click *Edit*. Click the *Set Default* button until the word *explore* in the Actions list turns bold. When you're done, close all of the dialog boxes you've opened. From now on, you'll always get Explorer when you open a window unless you explicitly ask otherwise.

7 Getting There From the Toolbar

Sometimes it's easier to use the keyboard to just tell the computer where to go. To get to a particular folder, choose *Start•Run* (**<Ctrl>-<Esc>**, then **R**), and type the folder's full path and name (for example, **d:\doc\spreadsheets**) in the resulting command line box. When you press **<Enter>**, Windows will open a single-pane window to the designated folder.

8 Getting There From Explorer

If you're in Explorer, there's another way to get to a destination through typing. Select *Tools•Go to* (or press **<Ctrl>-G**), and type the path in the pop-up box. Explorer will jump to the directory you type.

9 Getting There in DOS, Part I

Experienced DOS users know they can move up one folder level with the command **cd ..** But in a Win 95 DOS window,

Living in a Two-Windows World

Chances are, not everyone you work with is using Windows 95. Fortunately, the new operating system works well with its cousins Windows NT and Windows 3.*x*. Here are some suggestions for multicultural computing.

12 Restrain Yourself

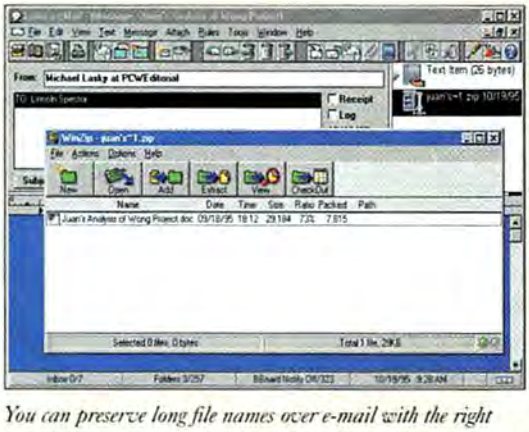
You can create file names as long as 255 characters, but the full path and name of any given file cannot be more than 260 characters. If you try to copy or move a file with a very long name to a folder within a folder—both with long names—Windows will announce that the name is invalid or too long (even though it was just fine in a folder with a shorter path).

Extremely long names have other disadvantages: Without special effort, you won't be able to see the entire name in a folder window. And try making sense of a list of extremely long file names. It isn't pretty. For sensible file management, try to keep your file names under 50 characters.

13 Zip to Preserve Long Names

How do you send files from one Windows 95 computer to another using a 16-bit e-mail package without losing your long file names? Compress the files first with a PKZip-compatible utility that supports long file names. Your correspondent will also need such a utility.

Several programs are on the market, and more are coming. Two utilities, Drag And Zip For Windows 95 and WinZip 6.0, are shareware programs available as dz95.exe and winzip95.exe, respectively, on PC World Online.



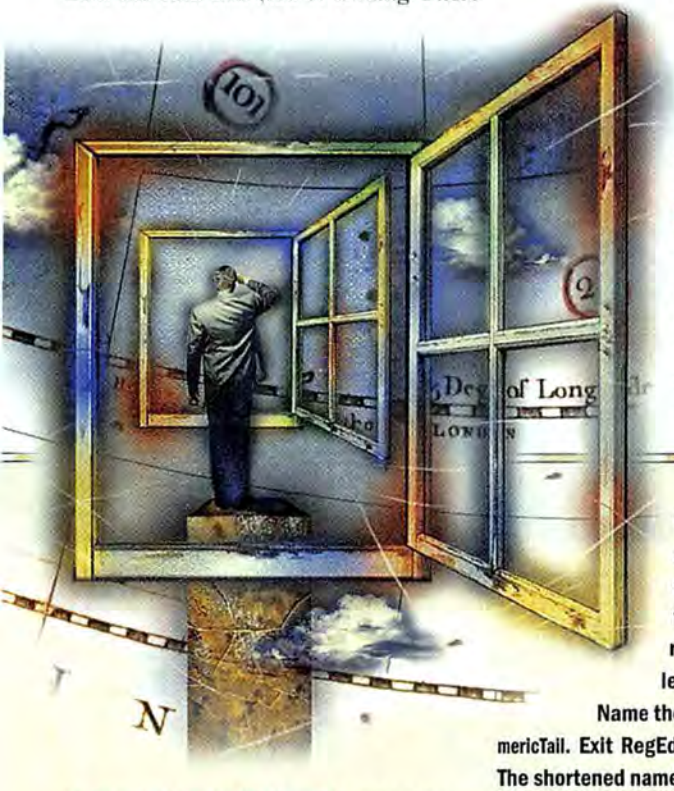
You can preserve long file names over e-mail with the right compression software. See "13: Zip to Preserve Long Names."

you can also type **cd ...** to move up two levels, **cd ....** to move up three levels, **cd .....** to move up four levels, and so on.

10 Getting There in DOS, Part II

You would think that you could open a folder from the DOS prompt the same way as from the Run box (see 7: Getting There From the Toolbar). You can't. Instead, at a DOS prompt, you must enter the command **start**, followed by the path, as in **start "c:\windows\start menu"**, to open a folder. The quotation marks are required if your path includes any spaces.

For this to work, your c:\windows\command folder must be in your autoexec.bat's path statement. It's probably already there, because Win 95's install program puts it there by default.



11 Find a Variety

You can use Windows 95's Find command (*Start•Find•Files or Folders*) to search for multiple file names, or partial names, at one time; just separate each with a comma, a space, or both. For example, enter ***.exe, *.com, *.bat, *.pif** in the Named field to look for all executable files.

An Explorer window (top) has a left pane, unlike a standard window (bottom). See "3: Getting to Explorer, Part I."

- **Drag And Zip For Windows 95** registration fee $30, additional $5 outside U.S.; Canyon Software; 800/280-3691 (sales only), 415/453-9779, support@canyonsf.com, http://www.canyonsf.com
  Reader service no. 709
- **WinZip 6.0 for Windows 95** registration fee $29; Nico Mak Computing, Inc.; 800/242-4775 (credit card orders), http://server.winzip.com/winzip/
  Reader service no. 710

14 Friendlier Short File Names

Is "O my liege.doc" easier to identify as omyliege.doc, or omylie~1.doc? If you prefer the former, it's best to change how Windows 95 shortens long file names.

After backing up your Registry files (see "Making the Registry Social"), launch RegEdit and go to the HKEY_LOCAL_MACHINE\System\CurrentControlSet\control\FileSystem folder as if you were navigating in Explorer. Right-click on an empty area of the FileSystem folder's right-hand pane, then select *New•Binary Value*. Name the resulting object NameNumericTail. Exit RegEdit and restart Windows. The shortened names of files you create from this point on won't always end in ~1.

15 Enforce a File-Naming System

The file names "John Smith's First Quarter Sales Figures.xls," "John Smith's Second Quarter Sales Figures.xls," and "John Smith's Third Quarter Sales Figures.xls" may be clear to you, but Windows 3.*x* users on your network will see them as johnsm~1.xls, johnsm~2.xls, and johnsm~3.xls. That's why you need a companywide file-naming policy.

First, set up all Windows 95 systems to use all eight characters in their short file names (see "14: Friendlier Short File Names"). Then lay down some rules. You could, for example, reserve the first two digits for the salesperson's initials, the next two for the quarter, and the final four to indicate project or subject matter. It requires some discipline, but at least this system will generate useful file names like jsq4sale.xls.

16 Hang On To That Floppy

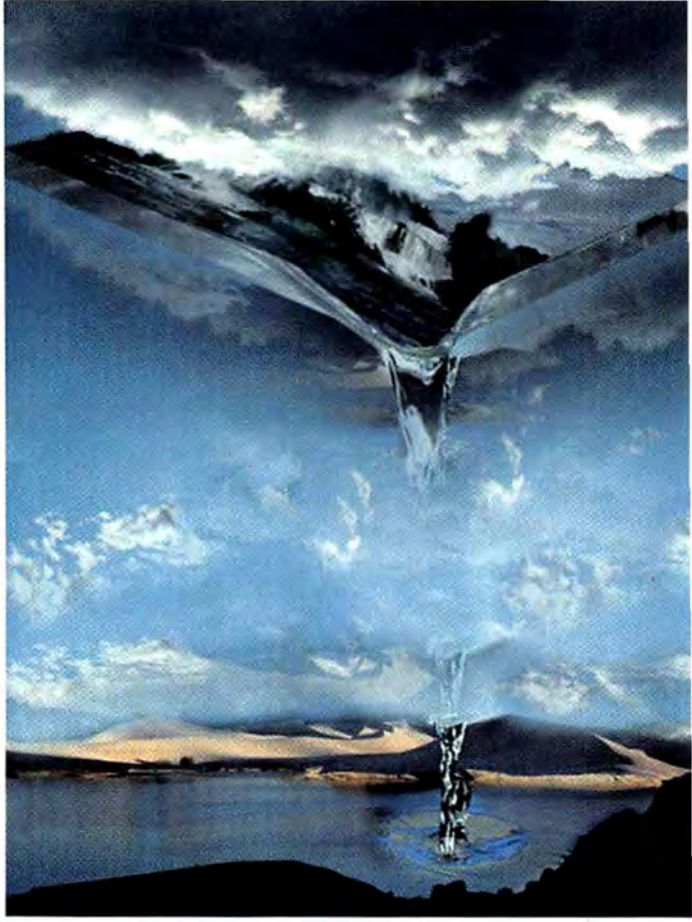
If you need to use a floppy disk to exchange files with a Windows 3.*x* user, make sure to get that same floppy disk back. If your coworker modifies the files without changing their names or locations, the long file names will still be there. But if your coworker uses another floppy, or changes the file name, or saves the files to a different directory, the original long name is history.

17 Watch Those File Types

Be careful with Windows 95 applications if some of your coworkers must stick with the Windows 3.*x* versions. If the file formats have changed, your coworkers may not be able to read your documents. For example, the new versions of Microsoft Office 95's Word and Excel use the same file formats as their 16-bit predecessors; but unless you take care how you save them, files created in PowerPoint 95 will be unreadable to Windows 3.*x* users.

18 Don't Use Old Disk Utilities

Don't use DOS or Windows 3.*x* disk utilities—such as backup, undelete, and defragmenting programs—on your Windows 95 computer. They can break the connections between long and short file names. Stick to utilities designed for Windows 95.



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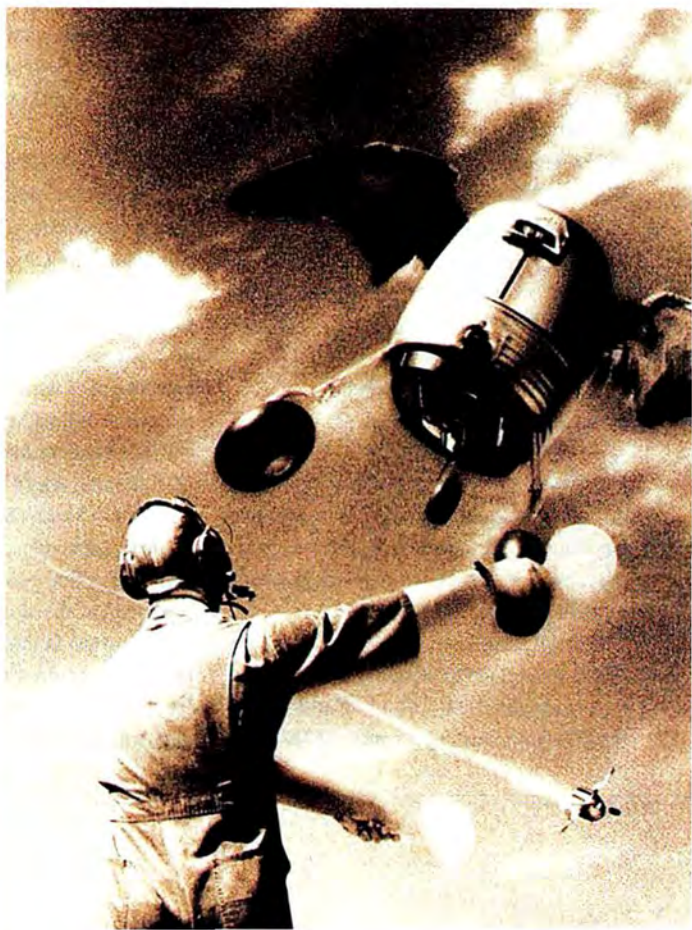

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Files That Click

19 Free Association

Do you want to load a document into an application it's not associated with? Select a document file or shortcut, then hold down **<Shift>** as you right-click it. Choose *Open With* to see a dialog box that lists applications and includes an Other button for browsing in case the application you want isn't listed.

20 Switch Affiliations

If you want to permanently change the application that's associated with a file type, follow the steps in "19: Free Association" to select the new program. Then, in the Open With dialog box, check *Always use this program to open this type of file*. Select your program and click *OK*.

21 Multiply and Conquer

If you regularly open a particular type of file in more than one application—say, .doc files in Word for Windows and WordPad—you can customize the right mouse menu to offer choices. In any folder window, choose *View*•*Options* and click the *File Types* tab. Select the file type you want to customize, click *Edit*, and click *New*.

In the New Action dialog box, type an appropriate description for the action, like **WordPad**. In the 'Application used to perform action' field, type the program's path and file name: for example, **"c:\program files\accessories\wordpad.exe"** (use quotation marks if the path contains spaces). If you don't remember the path or file name, click *Browse* to select the application from a dialog box.

Click *OK* and *Close* until you get back to your folder window. The next time you right-click the file type you've modified, your new options will be listed on the pop-up menu.

22 Dis-Extend Yourself

When you edit a file name, do you have to go out of your way to avoid changing the extension as well? You can get around this by hiding the extensions. In any folder window, select *View*•*Options* and click the *View* tab. Then check *Hide MS-DOS file extensions for file types that are registered* and click *OK*.

You'll be able to recognize file types by their icons and by the Type column in Details view. And don't worry; you'll still be able to see extensions of unassociated files.

23 See Some Extensions

If you've hidden extensions (see "22: Dis-Extend Yourself") but still have some extensions you want displayed, select *View*•*Options* in any folder window. Click the *File Types* tab and select from the list the file type with the extension in question. Click *Edit*. Check *Always show extension*, then click *OK* twice to close all dialog boxes.

24 What's Inside Your Files?

Ever want to examine a file without loading it into its respective application? Windows 95 comes with a file-viewing program called Quick View. To install the program, select *Start*•*Settings*•*Control Panel* and double-click the *Add/Remove Programs* icon. Click the *Windows Setup* tab, select *Accessories*, and click *Details*. Scroll down the resulting list until you find the *Quick View* option. Check the option and click *OK*. You'll be prompted through the installation.

Use the Open With box to permanently change file associations in a flash. See "20: Switch Affiliations."

To view a file, right-click it in a folder window or Explorer and select *Quick View*. If that option doesn't appear, Quick View doesn't support the file format.

25 Skip the Recycle Bin

To really delete a file—that is, to delete it without saving it to the Recycle Bin—press **<Shift>**-**<Delete>** or hold down **<Shift>** as you drag the file to the Recycle Bin.

26 Keep an Eye on Free Disk Space

To see how much free space you have on a given drive, select that drive in My Computer or Explorer and read the status bar at the bottom of the window. (If you don't see a status bar, choose *View*•*Status Bar* to make one appear.) To see a pie chart of used and free disk space, right-click any drive icon and choose *Properties*. To see how much disk space is taken up by all of the files within a folder, and by all of the files within that folder's folders, right-click any folder icon and choose *Properties*.

Emergency Start-Up Tips

In certain situations you may need to boot your system without loading the full Windows 95 environment. You can control how your system starts by pressing a function key when the boot screen says 'Starting Windows 95'.

	Action	Function key
27	Boot an older version of DOS, if one is still on your hard disk.	<F4>
28	Boot in Safe Mode, without network support, special graphics capabilities, or access to most peripherals.	<F5>
29	Boot in Safe Mode with network support.	<F6>
30	Present a menu of boot options such as Safe Mode, DOS prompt, and—if you're set up for it—an older version of DOS.	<F8>

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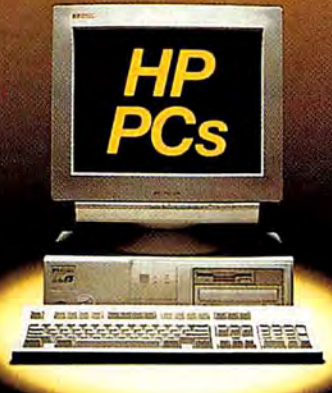

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Home on the Desktop

31 Make Your Own Start-Up Screen

You can display any 640 by 480, 256-color .bmp file—say, a company logo or a family photo—during the boot-up process. Unfortunately, Windows wants a 320 by 400 image, which it will stretch out to 640 by 480. So you have to do a bit of squeezing.

Load the original image into Paint, then select *Image•Stretch/Skew*. In the resulting dialog box, select *Horizontal* in the Stretch section and enter **50%**. Press **<Enter>** to compress the image.

You'll also want to shrink the image vertically 83.33 percent, something Paint won't let you do (integers only, please). As a workaround, use the *Image•Stretch/Skew* dialog box to first stretch it vertically by **104%**, then shrink it vertically by **80%**, closing and reentering the dialog box each time. The final image should be 320 by 400 with 256 colors. Save the file in the .bmp format.

Copy your new file to the boot drive's root directory and rename it **logo.sys**. Now, when you restart Windows, you'll see your image—in its original shape.

32 Make Your Own Log-Off Screens

Are you sick of the pacific, cloud-strewn screen that tells you to wait when you exit Windows? And what about the simple message that then tells you it's okay to turn off your computer? You can replace either or both of them.

Follow the steps outlined in "31: Make Your Own Start-Up Screen" to squeeze a 640 by 480 image down to size. If you want to replace the Wait screen, go to your Windows directory and rename the Logow.sys file **Original Logow.sys**. Move your squeezed .bmp file to the Windows directory and rename it **Logow.sys**. To change the Safe To Power Off screen, follow the same procedure with logos.sys. Just don't use the same image for both.

33 Dragging to Minimized Apps

In Windows 3.1 you could drop a file to a minimized application on the desktop, but you can't in Windows 95. The minimized applications now reside on the taskbar, and you can't drop anything on them.

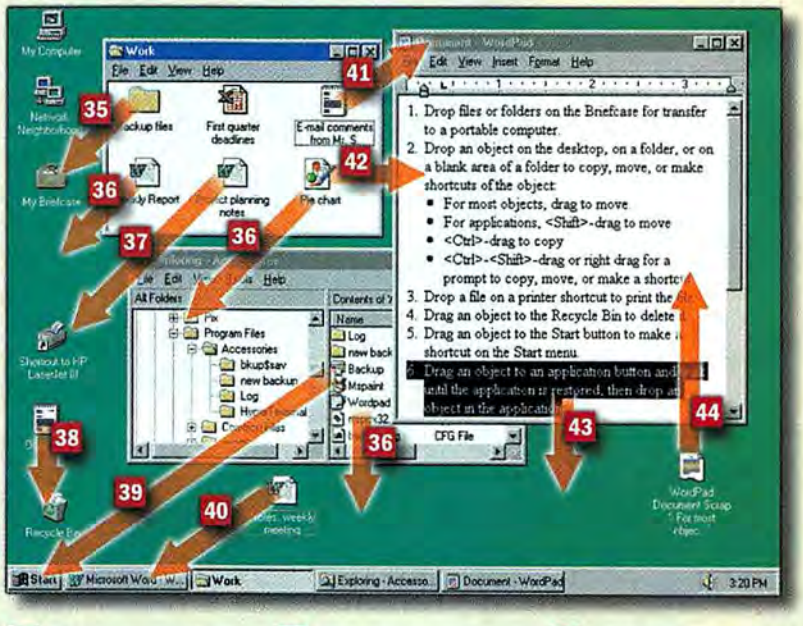
The solution? Drag the file to the appropriate button on the taskbar and hold it there until the application window is restored. Then drop it onto the window.

34 Make Multiple Desktops

If you share your computer with other people, or have different modes for working with it, you may want multiple custom desktops—each with its own desktop icons, Start menu, and program groups. Select *Start•Settings•Control Panel* and double-click the *Passwords* icon. To set up Windows for multiple configurations, make sure that you're at the *User Profiles* page, and select the second option, *Users can customize their preferences and desktop settings*. Check both boxes under User Profile Settings.

When you click *OK*, Windows asks if it can restart to set up the new configuration. As it reloads, it prompts you to set up a new user name and password; you can leave the password field blank if security isn't an issue. Answer *Yes* when asked whether to

Drag and Drop Primer



35 Drag files or folders to the My Briefcase icon, which you then transfer to a portable PC.

36 Drag a file to the desktop or a folder to copy, move, or make shortcuts of the object:
• A plain drag acts differently according to the object and destination. Dragging *moves* a file across directories and *copies* it across drives, but creates a shortcut of an application.
• <Shift>-drag always moves.
• <Ctrl>-drag always copies.
• <Ctrl>-<Shift>-drag, or right drag, always prompts to copy, move, or make a shortcut.

37 Drag a file to a printer shortcut to print the file.

38 Drag an object to the Recycle Bin to delete it.

39 Drag an object to the Start button to make a shortcut on the Start menu.

40 Drag an object to an application button on the taskbar and wait until the application is restored; then drop the object in the application window.

41 Drop a document on an application title bar to open the document.

42 Drop an object in an open document window to OLE-embed the object.

43 Drop a selection from a document onto the desktop or a folder to create a *document scrap*—a file fragment you can drop into another file.

44 Drop a document scrap on an open document window to paste or OLE-paste the scrap into the open document.

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save the settings for this user. Any desktop customizing you do will be unique to the configuration stored under this name.

To create additional configurations, just reboot Windows and type a different name when prompted. To change configurations, choose *Start•Shut Down* and select *Close all programs and log on as a different user.*

45 One Size Fits Few

You can change the size of your icons and their labels to suit your style. First right-click an empty spot on the desktop and choose *Properties*. Click the *Appearance* tab. Choose *Icon* from the Item list, then modify the Size number (the default is 32). To change the look of the icon label, choose a different font from the Font list, and adjust the size by editing the number under Size. When you're done, click *OK*.

46 Clearing the Desktop: My Briefcase

To get the My Briefcase icon off your desktop, simply drag the icon to the Recycle Bin. The program will still be available: When you need a Briefcase, right-click the desktop (or a blank part of any folder window) and choose *New•Briefcase*.

47 Clearing the Desktop: The Microsoft Network

You can't get rid of the Microsoft Network icon by dragging it to the Recycle Bin—you'll need to right-click the icon and choose *Delete*. A message will remind you that this deletes only the icon, not the whole program. If after deleting the icon you decide to use MSN, select *Start•Programs•The Microsoft Network*.

In Windows 95, you can change the size of your icons. See "45: One Size Fits Few."

16 Keyboard Shortcuts

TASKBAR

	Action	Function Key
50	Open the Start menu	<Ctrl>-<Esc>
51	Choose an option from the Start menu	<Ctrl>-<Esc>, option's first or underlined letter (or cursor keys, <Enter>)
52	Find a file or folder	<Ctrl>-<Esc>, <Esc><F3> or FF
53	Minimize all windows	<Ctrl>-<Esc><Alt>-M

DESKTOP, EXPLORER, FOLDER/DRIVE WINDOWS, WINDOWS 95 COMMON DIALOG BOXES

	Action	Function Key
54	Find a file in Explorer or folder window	<F3>
55	Open drop-down folder/drive list	<F4> when no other drop-down list box is active
56	Move up one level in Explorer or folder window	<Backspace>
57	Refresh or update a window[1]	<F5>
58	Select file or folder[1]	First letter of option you want; or cursor keys
59	Select all items[2]	<Ctrl>-A
60	Select multiple contiguous items[1,2]	Hold <Shift>, cursor keys
61	Select multiple noncontiguous items[1,2]	Hold <Ctrl>, cursor keys, <Space> to select/deselect items
62	See shortcut menu for selected item	<Shift>-<F10>
63	Delete selected item without placing in Recycle Bin	<Shift>-<Delete>
64	Open properties sheet for selected item[1]	<Alt>-<Enter>
65	Rename selected item	<F2>, change name, <Enter>

[1]Same as in Windows 3.1. [2] May not work in many dialog boxes.

48 Clearing the Desktop: Inbox and Recycle Bin

Clearing your desktop of the Inbox or Recycle Bin icons requires editing the Windows Registry. After backing up your Registry files (see "Making the Registry Social"), launch RegEdit and go to the HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\explorer\Desktop\NameSpace folder as if you were navigating Explorer.

NameSpace contains within it two folders that correspond to the icons for the Inbox and the Recycle Bin. The folder names are ridiculously long and made up mostly of numbers. But when you select one of the folders, an object in the right pane tells you if the folder is for the Inbox or the Recycle Bin. You can then delete the folder corresponding to the icon that you don't want appearing on your desktop.

You can always get to the Inbox from *Start•Programs•Microsoft Exchange* and use the <Delete> key to delete a selected file. If you need to get into the Recycle Bin or restore files, just go the Recycle Bin folder in your primary hard drive's root folder.

49 Clearing the Desktop of Everything

If you really want to keep the desktop clean as a whistle, use Windows 95's System Policy Editor to ban all icons except currently running programs. Start the Policy Editor (see "86: Meet the System Policy Editor") and choose *File•Open Registry*. Double-click the *Local User* icon. Navigate through the tree to the Shell\Restrictions section.

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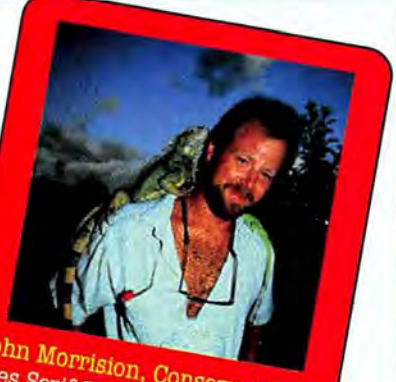

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Under the Restrictions branch, check *Hide all items on Desktop*. Click *OK*, then exit the Policy Editor, saving your file when prompted. The next time you load Windows, there will be no objects on your desktop. And you won't be able to put anything there—the price of enforced cleanliness.

66 Rearrange Your Windows

Want to bring order to all those windows on your desktop? Right-click a blank area of the taskbar and choose either *Cascade*, *Tile Horizontally*, or *Tile Vertically*. If you change your mind at any time, right-click the taskbar again and choose *Undo*.

67 Get Those Apps Off the Wallpaper

You can make all your open windows disappear when you need access to something on the desktop: Just right-click a blank area of the taskbar and choose *Minimize All Windows*. To make the windows reappear, right-click the taskbar again and then choose *Undo*.

68 Minimize All but One

What if you want to minimize all your open windows but one? Just open a dialog box like *File•Open* within the application you want to keep on screen (in a folder window, choose *View•Options*). Then, right-click a blank area of the taskbar and select *Minimize All*. This will minimize all open windows except the one with the open dialog box.

69 Find That Properties Sheet

If you've got a properties sheet on screen and you manage to bury it in open windows, just right-click a blank area of the taskbar and choose *Minimize All*. This minimizes all the windows except the properties sheet.

70 Clean Up Folder Windows

If you browse through folder windows in multiple-window mode (as set in the Folders tab when you choose *View•Options*), your desktop can get cluttered pretty quickly. To close not only the current folder window but all "parent" folder windows you opened on the way there, hold down **<Shift>** as you click the close box on the far right of the current window's title bar.

71 Dynamic Bit-Map Icons

Want to turn the icon for each of your .bmp files into a thumbnail of the actual image? After backing up your Registry files (see "Making the Registry Social"), launch RegEdit and go to the HKey_Classes_Root\Paint.Picture\DefaultIcon folder as if you were navigating Explorer. Double-click the *(Default)* entry in the right-hand pane. Replace the contents of the 'Value data' field with **%1**, click *OK*, and exit RegEdit. Your new bit-map thumbnail icons will show up when you next start Windows. (This doesn't work with other graphic formats.)

You can make the icon for each .bmp bit-map image speak for itself. See "71: Dynamic Bit-map Icons."

72 Keyboard Access to the Desktop, Part I

Here's an easy way to access objects on your desktop without using your mouse. To set it up, open a single-pane folder window to anywhere on your system. If necessary, select *View•Toolbar* to make the folder's toolbar visible. Click the arrow next to the toolbar's drop-down list, scroll to the top of the list, and click *Desktop*. Move this window to a convenient place or minimize it.

Next time you need to access something on the desktop, just press **<Alt>-<Tab>** until you return to this folder window. Use the cursor keys to navigate to the icon you want, then press **<Enter>**. As long as you don't close this window or change it to view another folder, it will stay put—even when you exit and reenter Windows.

73 Keyboard Access to the Desktop, Part II

There is another way to get to your favorite desktop icons without taking your fingers off of the keyboard. To set it up, right-click the *Start* button and choose *Open* or *Explore*. Create a folder within the Programs folder (or within a folder in the Programs folder) called **Icons From Desktop**. Right-drag your favorite desktop icons to the new folder window. Select *Create Shortcut(s) Here* in the pop-up dialog box.

Right-click one of your new shortcuts and choose *Properties*. Click the *Shortcut* tab and assign a shortcut key before clicking *OK*. Repeat for each icon. Now you can just press your custom keys each time you need one of these desktop items.

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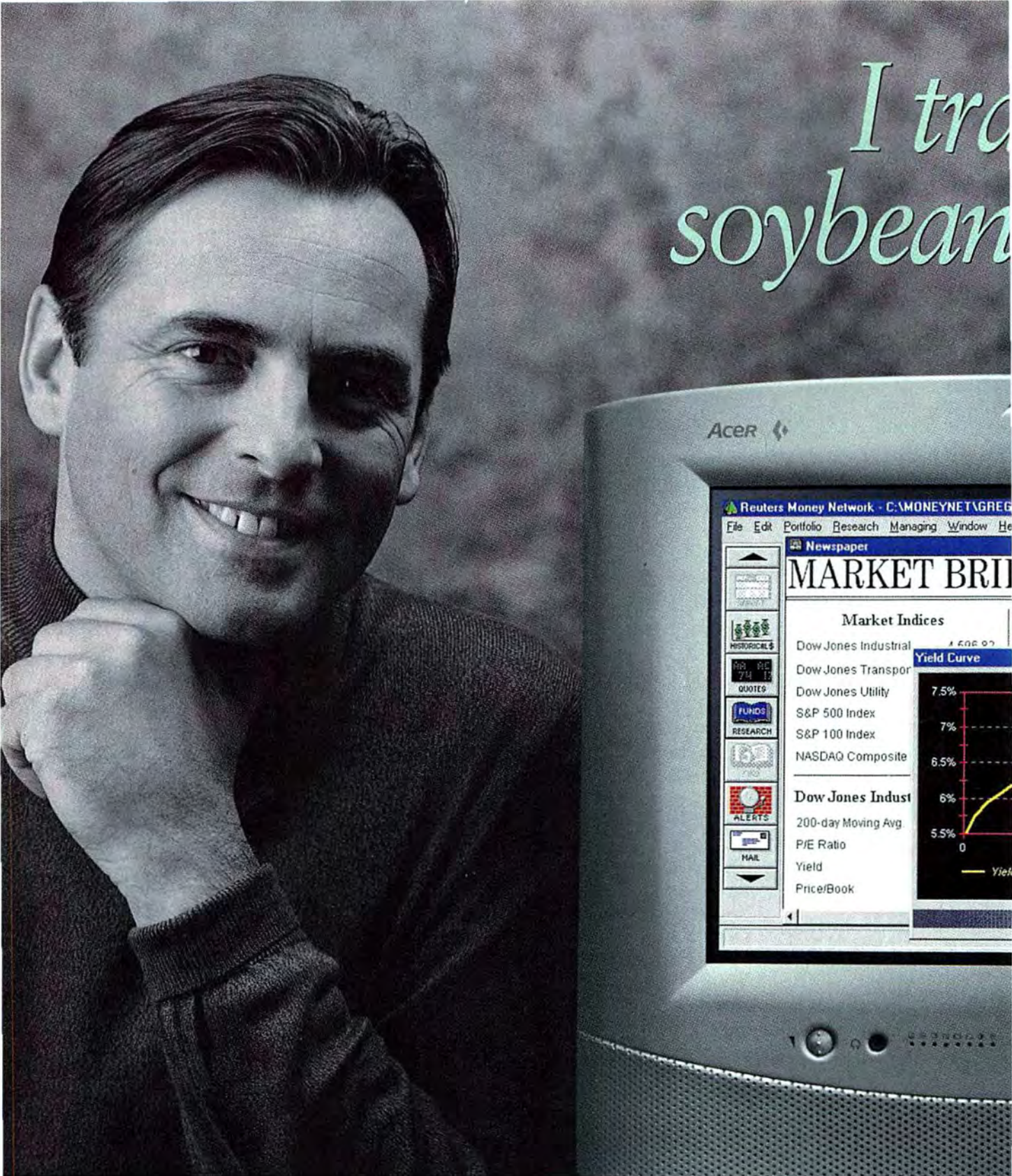

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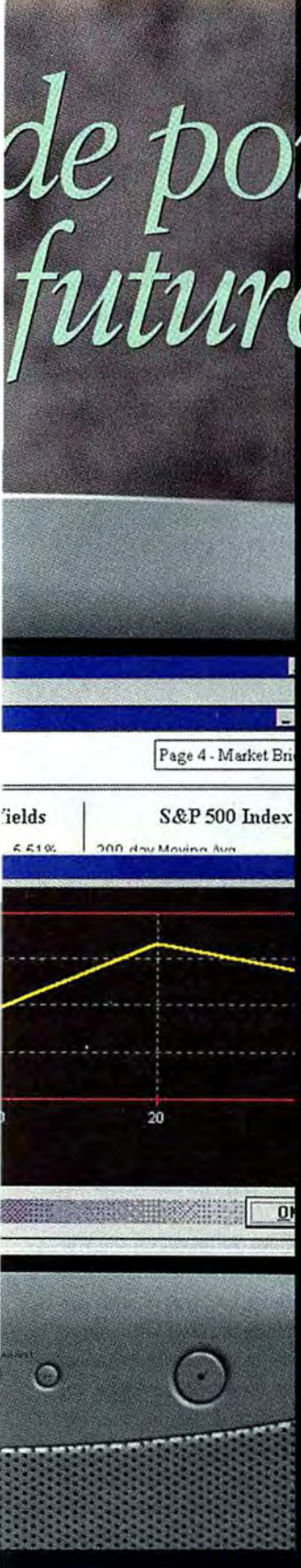

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Short Work With Shortcuts

74 Speed Up the Start Menu

Do you want to speed up the Start menu's cascading submenus? After making a backup of your Registry files (see "Making the Registry Social"), launch RegEdit and go to the HKEY_CURRENT_USER\Control Panel\desktop folder. Right-click an empty space in the right panel, select *New • String Value*, and name the resulting new object **MenuShowDelay**. Double-click the object, and in the Value Data text box enter a number from 1 to 10. Press **<Enter>** to close the box. Use trial and error to find the right number for you. Lower numbers are faster.

75 Clearing the Documents Menu

To empty the Documents menu completely, right-click a blank area of the taskbar and choose *Properties*. Click the *Start Menu Programs* tab and click the *Clear* button in the *Documents Menu* box. Then click *OK*.

76 Trim the Shortcut Labels

If you're in the habit of creating a lot of shortcuts in a brief amount of time, you're going to get real sick of removing the words 'Shortcut to' from the beginning of each one. Luckily, there's a way to train Windows to stop adding those words—at least temporarily.

First create a shortcut by right-dragging an object to a new location and selecting *Create Shortcut(s) Here*. Then, with the object still selected, press **<F2>** to change its file name and delete the words 'Shortcut to'. Repeat this exercise with other objects until Windows gets the hint and stops adding the unwanted words (usually three to six times). Unfortunately, Windows forgets its lesson when you shut it down.

Making the Registry Social

Many of the tips we're giving you involve altering the *Registry*, where Windows 95 keeps most of its configuration information. Here are a few things you should know before playing with Windows 95's secret powerhouse.

84 Back Up the Registry

A Registry error can seriously mess up your system, so it's a good idea to back up your Registry files in case something goes wrong. Restart Windows 95 in MS-DOS mode by selecting *Start • Shut Down • Restart the computer in MS-DOS mode*. You can't work with these files inside the Windows GUI, or even in a DOS box inside the GUI. Go to your Windows directory, and run the following commands:

```
attrib -r -s -h system.da?
attrib -r -s -h user.da?
copy system.da? c:\temp
copy user.da? c:\temp
attrib +r +s +h system.da?
attrib +r +s +h user.da?
```

You can copy to a directory other than c:\temp. If you edit the Registry a lot, you may want to put these commands into a batch file.

Type Win to reenter the Windows GUI. Launch the Registry by selecting *Start • Run* and entering the command regedit. Should you ever make a disastrous change in your Registry, exit Windows by selecting the option *Start • Shut Down • Restart the computer in MS-DOS mode*; at the DOS prompt, copy your backup files back to your Windows directory.

85 Backing Up Part of the Registry

Before making a change to a specific area of the Registry, you can back up that section only. From RegEdit's folder tree, select the folder containing whatever you're about to change. Then select *Registry • Export Registry File*. In the resulting dialog box, enter a file name and, in the Export range section, make sure *Selected branch* is selected and that its text field shows the path of the Registry piece you're interested in. Click *Save*.

To restore these items later, just choose *Registry • Import Registry File*, select the file you saved, and click *Open*. Note that this won't help if your changes break Windows to the point where you can't even load it.

86 Meet the System Policy Editor

There's a simpler tool than RegEdit for modifying some parts of the Registry: the System Policy Editor. This program comes on the Windows 95 CD-ROM (it isn't included on the floppy disk version) but was probably not installed on your system. To install it, put the CD-ROM in your drive and wait for the Windows 95 window to come up.

Click *Add/Remove Software*. On the Windows Setup page, click *Have Disk*. In the Install From Disk dialog box, type d:\admin\apptools\poledit, adjusting the drive letter appropriately. Check the *System Policy Editor* box and click *Install*. Click *OK* to close the Add/Remove Programs dialog box, then exit the CD-ROM window.

You can start the System Policy Editor by choosing *Start • Programs • Accessories • System Tools • System Policy Editor* or by typing poledit in the Run box. The first time you start the System Policy Editor, it may prompt you for a template file; guide it to Windows\Inf\Admin.adm. To start modifying the Registry, choose *File • Open Registry*.

77 Control Yourself

If you frequently tweak your system, a Control Panel menu will save you time. First, train Windows not to overuse the words 'Shortcut to' (see "76: Trim the Shortcut Labels"). Right-click the *Start* button and choose *Open* or *Explore*. In the Start Menu folder, select *File•New•Folder* to create a new folder called **Control Panel**. Next, choose *Start•Settings•Control Panel*. Select all or some of the icons (press **<Ctrl>-A** to select all of them). Drag them to your new Control Panel folder and confirm that you want to create shortcuts. Now you can access these functions directly from the Start menu.

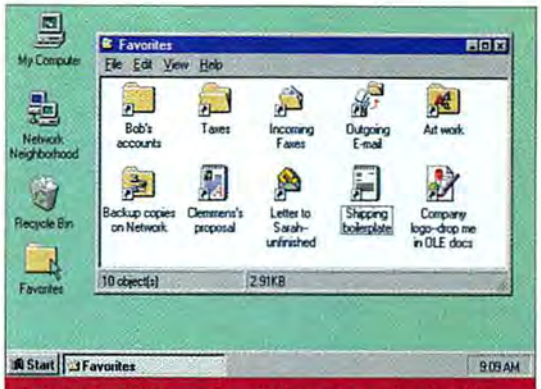
78 Restore Menu Default

If you bungle your customization attempts and want to start all over, don't worry. You can quickly restore to the Programs menu everything that Windows 95 added during installation. Select *Start•Run*, type **grpconv /s**, and press **<Enter>**.

79 Customize Shortcut Icons

Windows 95 won't allow you to customize icons for individual folders or files, but you can customize icons for the shortcuts that point to them. Just right-click a shortcut and choose *Properties* (or select it and press **<Alt>-<Enter>**). Click the *Shortcut* tab and click *Change Icon*.

If you don't see an icon you like, use the File Name box or the *Browse* button to go to another file that contains icons. Your best bets can all be found in the \Windows\System folder: Take a look in shell32.dll for file, folder, drive, printer, and other icons; pifmgr.dll for a fanciful collection of miscellaneous icons; syncui.dll for briefcase, file, and folder icons; systray.exe for battery, power cord, and speaker icons; awfxex32.exe for fax icons; or user.exe for miscellaneous icons.



Put shortcuts to your favorite haunts, customized to look their best, in a single folder. See "79: Customize Shortcut Icons" and "81: Make a Favorites Folder."

80 The "Send To" Scenario

If you frequently copy or move files to a particular folder, put a shortcut to it in the Windows\SendTo folder (your path may vary). Then, to move or copy a file, right-click it and choose *Send To*, followed by the desired destination. If the destination is on the same drive, Windows will move the file; otherwise, it copies the file. To force a move, hold down **<Shift>** when you select the destination; to force a copy, hold down **<Ctrl>**.

81 Make a Favorites Folder

It's handy to have a folder of shortcuts to your favorite locations. Right-click a blank area on your desktop and choose *New•Folder*. Type a name for it and press **<Enter>**. Open it, and use Explorer to go to a folder you often use. Right-drag that folder to your new shortcuts folder, choosing *Create Shortcut(s) Here* from the pop-up menu. Repeat for all folders you use often. If you want a clean desktop, move your shortcuts folder to your c:\windows\Start Menu folder.

82 Faster Menu Navigation

Keep your fingers on the keyboard as much as possible. Press **<Ctrl>-<Esc>** to bring up the Start menu, followed by the first letter of the menu option you want.

83 Unique Start Menu Keys

If the Start menu or one of its submenus has two options that start with the same character, launching them from the keyboard is that much more of a hassle. So make sure each item starts with a unique character. If you can't come up with enough workable names, use a numbering system.

87 Quickie Registry Reload, Part I

Most of the time, Windows has to go through a long reload process before you can see Registry changes you've made. But sometimes you can fool Windows into reloading *part* of the Registry.

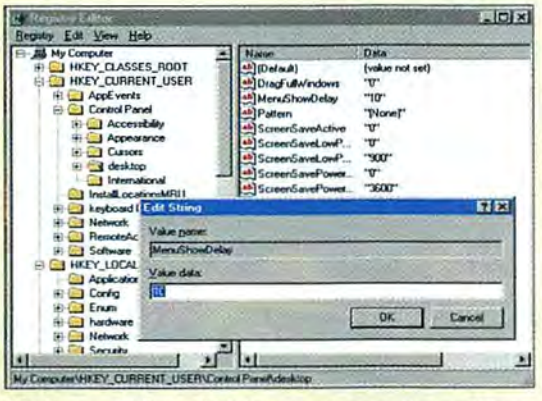
Press <Ctrl>-<Alt>-<Del>, select *Explorer* in the resulting dialog box, then click *End Task*. When the Shut Down Windows dialog box appears, click *No*. In a few seconds, another dialog box will appear to inform you that Explorer is not responding; click *End Task*, and you'll see the desktop rebuild itself, during which Windows reloads the portion of the Registry that's stored in system.dat. Any open applications will keep running without a hitch.

88 Quickie Registry Reload, Part II

If Windows isn't fooled, and you're on a network, here is your next best bet: From the Start menu, select *Shut Down*. In the resulting dialog box, select *Close all programs and log on as a different user*, then click *Yes*. This makes Windows shut itself down partway, but not all the way, before starting up again.

89 Quickie Registry Reload, Part III

If you're not on a network, there's still another method. In the Shut Down Windows dialog box, select *Restart the computer*. Then hold down <Shift> while you click *Yes*. Windows will shut itself down, then reload again without going through the process of rebooting the machine and reloading DOS. It's not as fast as the other methods, but it always works.



The Registry Editor, which bears a strong family resemblance to Explorer, is your gateway to Windows 95's inner workings.

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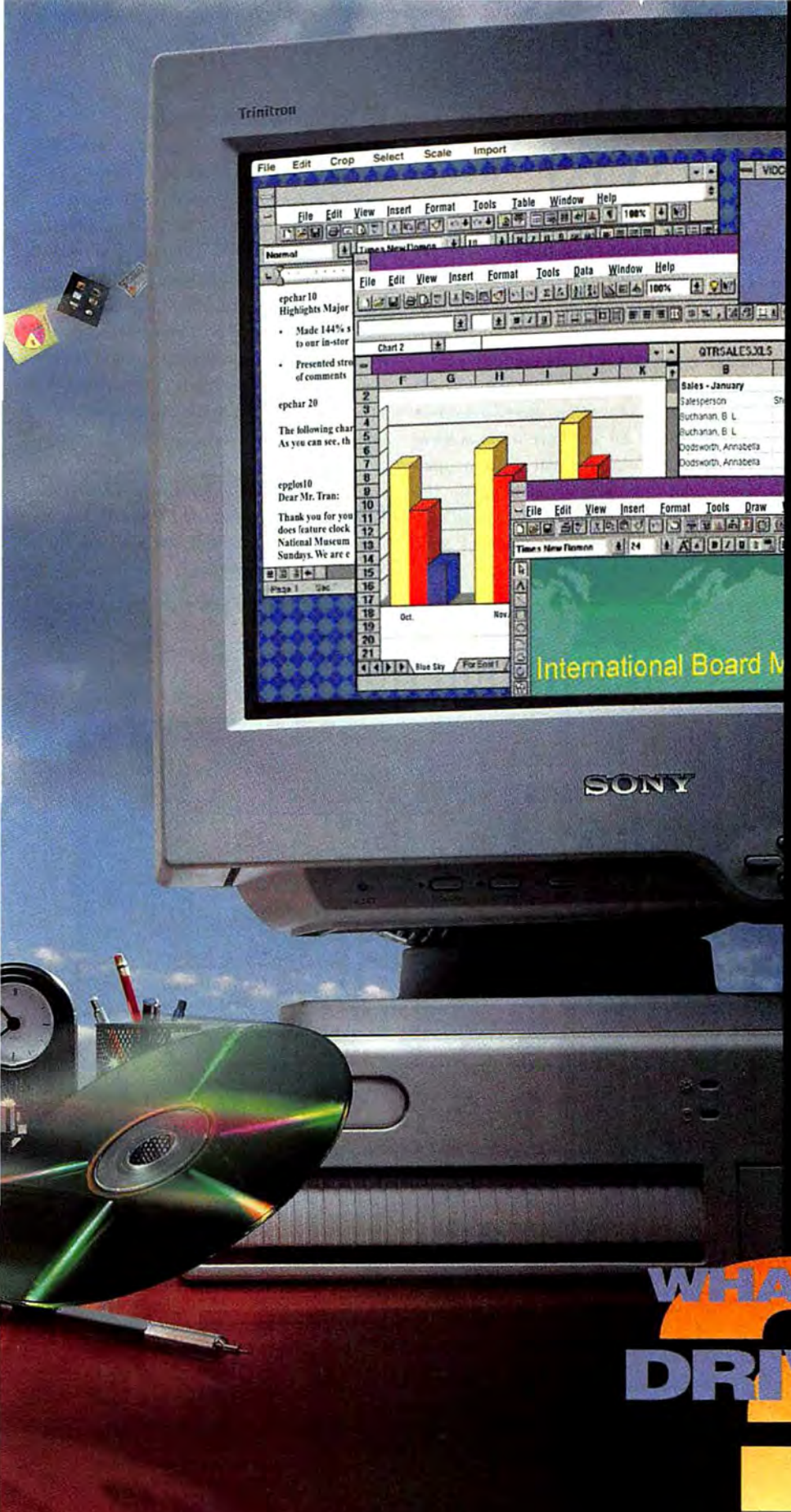

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Freebie Fixers

90 Waste Not, Want Not

If you don't use one of the little applications and accessories that come with Windows 95, delete it to free up valuable disk space. To properly remove it, choose *Start • Settings • Control Panel*. Double-click *Add/Remove Programs*. Click the *Windows Setup* tab and scroll through the list of preinstalled toys to find the item you don't want. (To remove specific items, you may have to select a general category, such as *Accessories*, and click *Details*.) Then clear the check mark from the box and click *OK* (twice if needed).

91 Compact Your WordPad Toolbars

By default, WordPad displays its standard toolbar and its format bar as two separate bars stacked at the top of the window. But if your screen resolution can handle it, you can save some real estate by making the toolbar and format bar a single long bar. Just position your pointer over an edge of one of the bars and drag it on top (and a little to the side) of the other bar.

If you want more vertical space and don't mind giving up some of the horizontal, you can also drag the toolbar to the left or right edge (this doesn't work with the format bar). Or you can make either bar float freely by dropping it anywhere other than on an edge of WordPad's window.

92 Relocate Paint Tools

If you don't like the locations of the tool box or color box in Microsoft Paint, just drag the box away from the edge of the window. The box becomes a floating palette that you can reposition anywhere on your screen. You can also make the color box snap to the top or bottom edges of the window and make the tool box snap to the left or right edges by dropping each on the appropriate edge.

93 Open Media Player From Any .avi Window

Any time you double-click an .avi file, Windows plays the movie for you in a window that has only minimal controls. For more control over your entertainment, double-click the window's title bar for the full Windows Media Player.

94 Track Calls With Phone Dialer

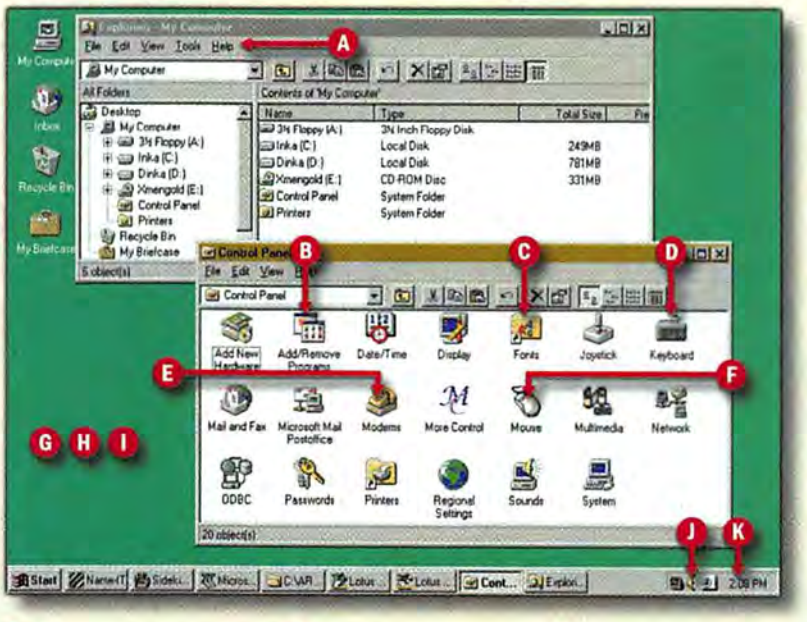
Ever wonder how much time you're spending on the phone? Want to track just how long that technical support department is keeping you on hold? You can find out—if you make your calls with the Windows 95 Phone Dialer (*Start • Programs • Accessories • Phone Dialer*). All you have to do is leave Phone Dialer's Active call window open while you talk; when you hang up the phone, click *Hang Up* in the Active call window. Whenever you want to check your calls, just choose *Tools • Show Log*.

95 Let 16-bit Apps Share the Line

If you keep Exchange set to receive faxes at all times, it will block 16-bit Windows 3.*x* and DOS communications programs from any access to the modem. (You shouldn't have any trouble with Windows 95 applications). The easiest way to give 16-bit programs access is to right-click the fax icon on the right end of the taskbar, choose *Modem Properties*, then click *Don't answer*. When you're done borrowing the fax-modem, return to the same dialog box and select *Answer after*.

PC WORLD online *The files mentioned in this article are available on PC World Online. Scott Dunn and Scott Spanbauer are* PC World *contributing editors.*

Configuration Hot Spots



A Create file associations: Explorer • View • Options • File Types

B Add and remove bundled applets: Control Panel • Add/Remove Programs • Windows Setup

C Install fonts: Control Panel • Fonts • File • Install New Font

D Set keyboard repeat and cursor blink rates: Control Panel • Keyboard • Speed

E Set modem port and speed: Control Panel • Modems • Properties

F Set mouse double-click speed: Control Panel • Mouse • Buttons

G Change wallpaper: Right-click desktop, Properties • Background

H Change windows color scheme: Right-click desktop, Properties • Appearance

I Change display resolution and color depth: Right-click desktop, Properties • Settings

J Adjust audio volume: Click speaker icon in taskbar

K Set date/time: Double-click taskbar time display

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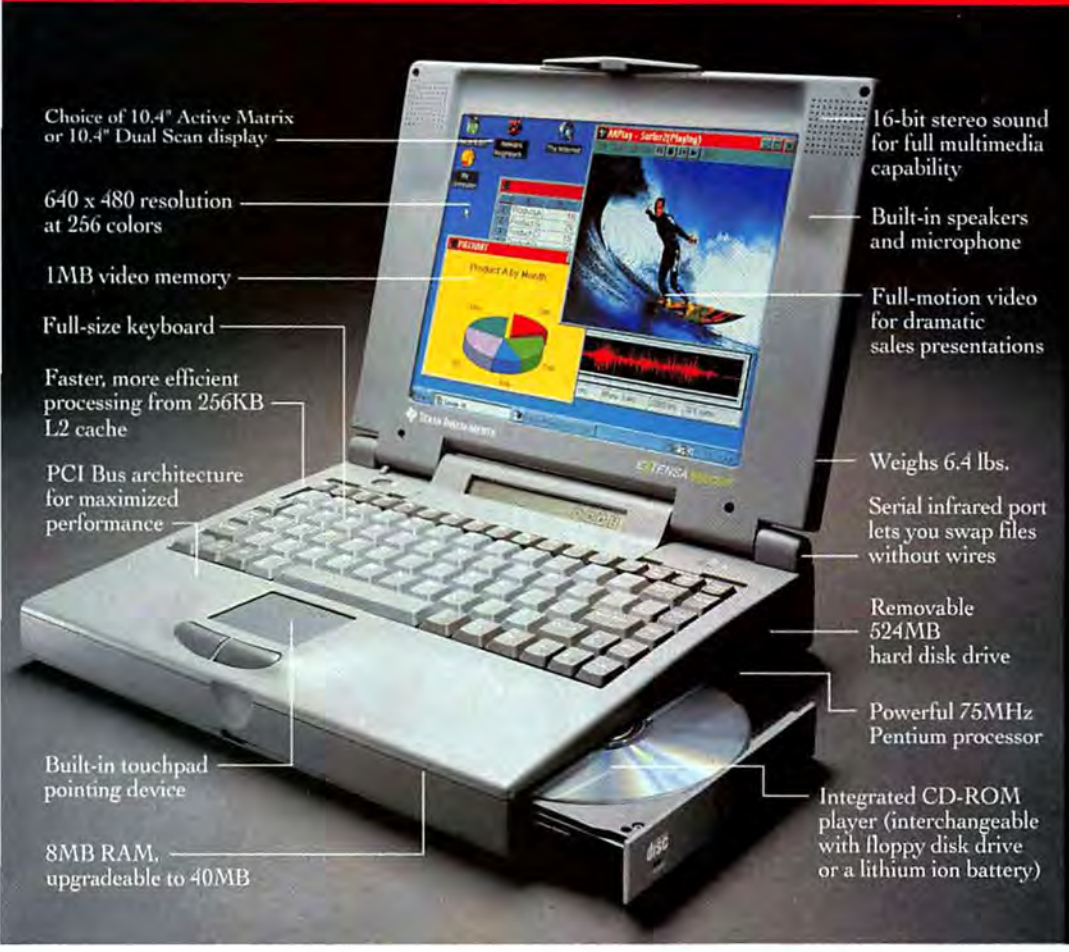

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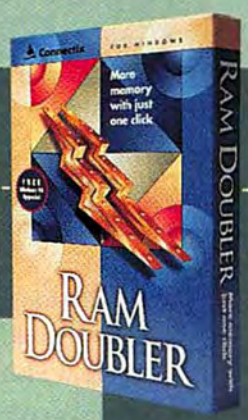

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HOW TO ENTER: FOR BEST RESULTS, PHOTOCOPY THIS PAGE, DO NOT TEAR IT OUT. Fax your completed questionnaire to *PC World* at 415/921-0501. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Windows 95 Fax Survey, Box W95, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by January 31, 1996. **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 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 daytime phone number below. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES!

LAST, FIRST NAME _____ DAYTIME PHONE NUMBER _____ – _____ – _____

IF YOU ARE USING WINDOWS 95

If you are running Windows 95 on more than one PC, please answer for the PC you use most often.

1. When did you acquire Windows 95?

1 ○ August 3 ○ October 5 ○ December
2 ○ September 4 ○ November 6 ○ January

2. How did you acquire it?

7 ○ Purchased the upgrade package
8 ○ Purchased a new PC (Skip to question 8.)

3. To run Windows 95, did you add

9 ○ RAM 10 ○ New hard disk 11 ○ Neither

4. Did you have any installation problems, including hardware installation difficulties? 12 ○ Yes 13 ○ No

5. If yes, please describe: _____

6. If yes, were the problems resolved to your satisfaction?

14 ○ Yes 15 ○ No

7. How would you characterize your PC's performance under Windows 95?

16 ○ Faster 17 ○ Slower 18 ○ About the same

8. What was your previous operating system?

19 ○ DOS with Windows 3.*x*
20 ○ DOS with Windows for Workgroups 3.*x*
21 ○ DOS only
22 ○ OS/2 2.*x*
23 ○ OS/2 Warp
24 ○ Other

9. Why did you upgrade? (Mark all that apply.)

25 ○ Came preinstalled on my PC
26 ○ Dissatisfied with previous operating system
27 ○ Good reviews in the press
28 ○ Recommendation from friend or coworker
29 ○ Improved interface
30 ○ Plug and Play hardware
31 ○ Greater stability/crashproof
32 ○ To run 32-bit applications
33 ○ Preemptive multitasking
34 ○ Ease of use
35 ○ Faster performance
36 ○ Long file names
37 ○ Built-in networking
38 ○ To access the Internet
39 ○ Becoming company standard
40 ○ Improved multimedia
41 ○ Remote access capability
42 ○ To keep up with technology
43 ○ Other

10. Are you using any applications or utilities designed for Windows 95 aside from those that come with Windows 95? 44 ○ Yes 45 ○ No

11. Which applications or utilities? _____

12. Do you plan on upgrading to Windows 95 applications?

46 ○ Yes, for a few applications 48 ○ No
47 ○ Yes, for as many applications as possible 49 ○ Don't know

13. Did you uninstall Windows 95?

50 ○ Yes 51 ○ No 52 ○ I tried but was unsuccessful

14. Have you had any problems running software under Windows 95? 53 ○ Yes 54 ○ No

15. If so, what kind of problems and with which programs?

16. Have you found any Windows 95 bugs? 55 ○ Yes 56 ○ No

17. If yes, please describe: _____

18. Are you using long file names when you create documents and data files? 57 ○ Yes 58 ○ No 59 ○ Sometimes

19. Compared to the operating system you upgraded from, how would you describe your satisfaction with Windows 95?

60 ○ Poor 62 ○ Good 64 ○ Excellent
61 ○ Fair 63 ○ Very good 65 ○ Too soon to tell

20. Are you glad you switched to Windows 95?

66 ○ Yes 67 ○ No 68 ○ Not sure

21. Why or why not? _____

22. Please describe any other positive or negative experiences you have had with Windows 95:

IF YOU ARE NOT USING WINDOWS 95

23. If you have not upgraded, do you plan to?

69 ○ No 72 ○ Yes, within 6 months
70 ○ Yes, within a month 73 ○ Yes, more than 6 months from now
71 ○ Yes, within 3 months 74 ○ Not sure

24. What are your reasons for not upgrading? (Mark all that apply.)

75 ○ Happy with current operating system
76 ○ No need
77 ○ Price
78 ○ Hardware not powerful enough
79 ○ Compatibility problems with other users and PCs
80 ○ Hardware/software incompatibilities
81 ○ Windows 95 too buggy
82 ○ Windows 95 too slow
83 ○ Lack of 32-bit applications
84 ○ No time to install or learn
85 ○ Company has standardized on another operating system
86 ○ Distrust Microsoft
87 ○ Haven't gotten around to it
88 ○ Other

FOR ALL RESPONDENTS

25. What type of PC do you use most often?

89 ○ Desktop 90 ○ Laptop/notebook

26. Where do you use it primarily?

91 ○ At work 92 ○ At home 93 ○ In a home office

27. What is its CPU?

94 ○ Pentium Pro 96 ○ 486 class 98 ○ Other/don't know
95 ○ Pentium class 97 ○ 386 class

28. How much RAM does it have?

99 ○ 4MB or less 101 ○ 9MB–12MB 103 ○ 17MB–32MB
100 ○ 5MB–8MB 102 ○ 13MB–16MB 104 ○ More than 32MB

29. Is it on a network? (Mark all that apply.)

105 ○ On a NetWare network 107 ○ On another network
106 ○ On a Windows 95 network 108 ○ Not on a network

30. How did you get this copy of *PC World*?

109 ○ On the newsstand 111 ○ From someone else
110 ○ By subscription

31. Are you willing to be contacted for a follow-up interview?

112 ○ Yes 113 ○ No

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- **Talk Back Live with a PC World Editor! Jan. 17 9PM ET on AOL.**
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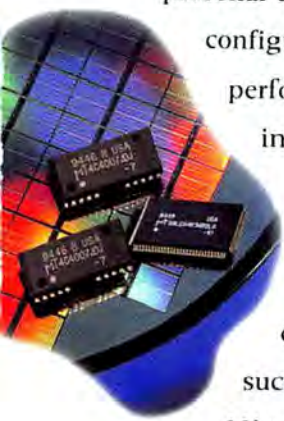

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PC MAGAZINE EDITORS' CHOICE
May 30, 1995
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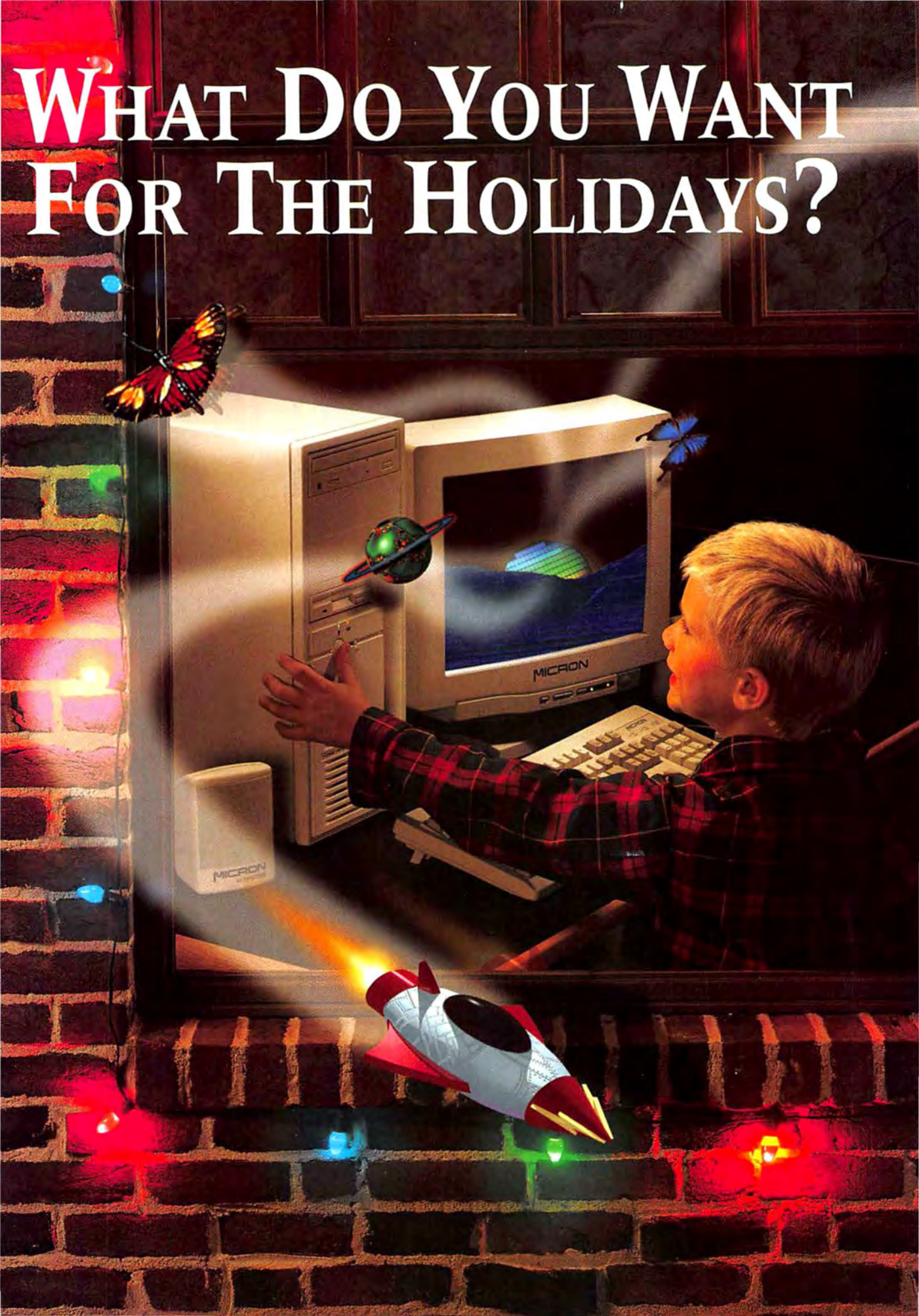
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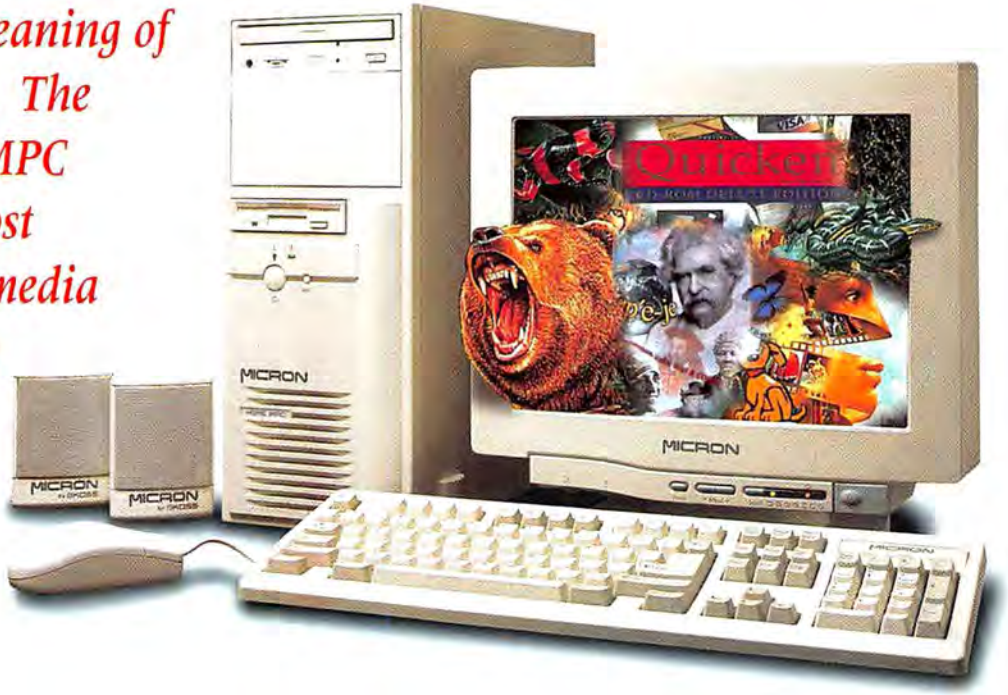

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PC MAGAZINE EDITORS' CHOICE
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- *Tool-free* mini-tower or desktop
- Microsoft® Mouse, 104-key keyboard
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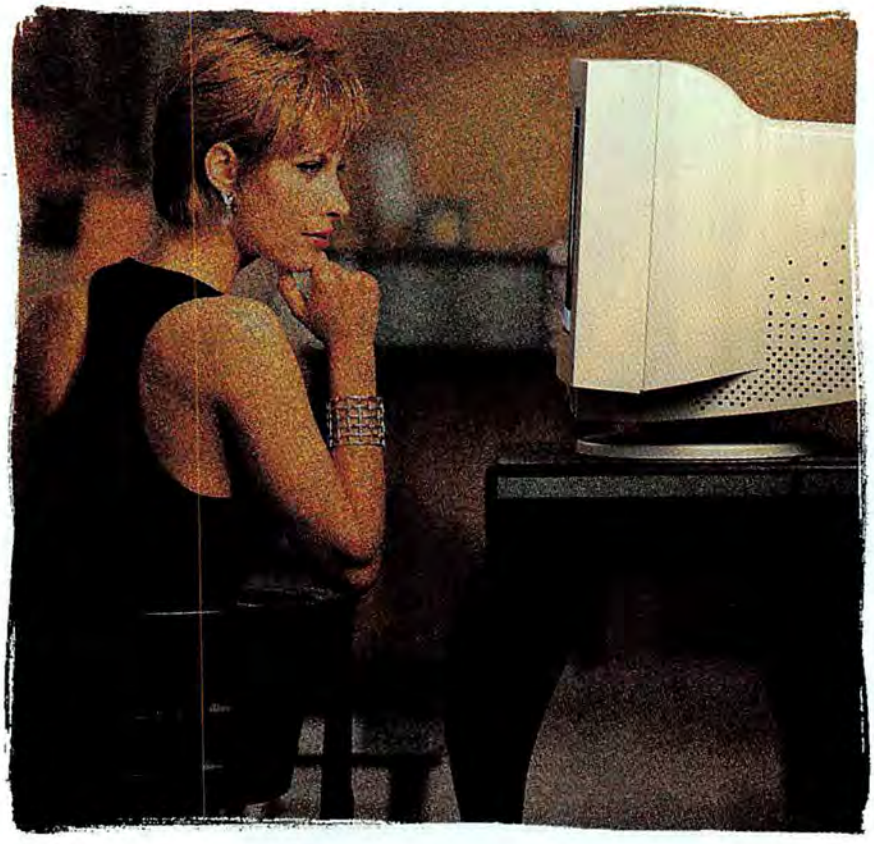

From the continent that gave us museums and luxury automobiles come their combined spiritual equivalent: Nokia monitors. Nokia is already a household name (and cafe and office name too) throughout Europe. And now Nokia monitors are quickly winning the hearts and eyes of Americans too.

The European passion for beauty is expressed in the magnificent clarity of the screens and the soothing refresh rates.* The Nordic obsession with technical perfection is embodied in the variety and sensitivity of Nokia's controls and components. And the continental lust for life and good health is evident in the extraordinary MPR II-compliant emissions controls Nokia invented.

Add to this the sheer elegance of the tooling and plug-and-play connectivity under Windows 95.** A Nokia monitor is more than electronics. It's art. But, it's an avant garde that's quite easy to appreciate. Especially when it makes those darn little subtitles so much easier for you to read.

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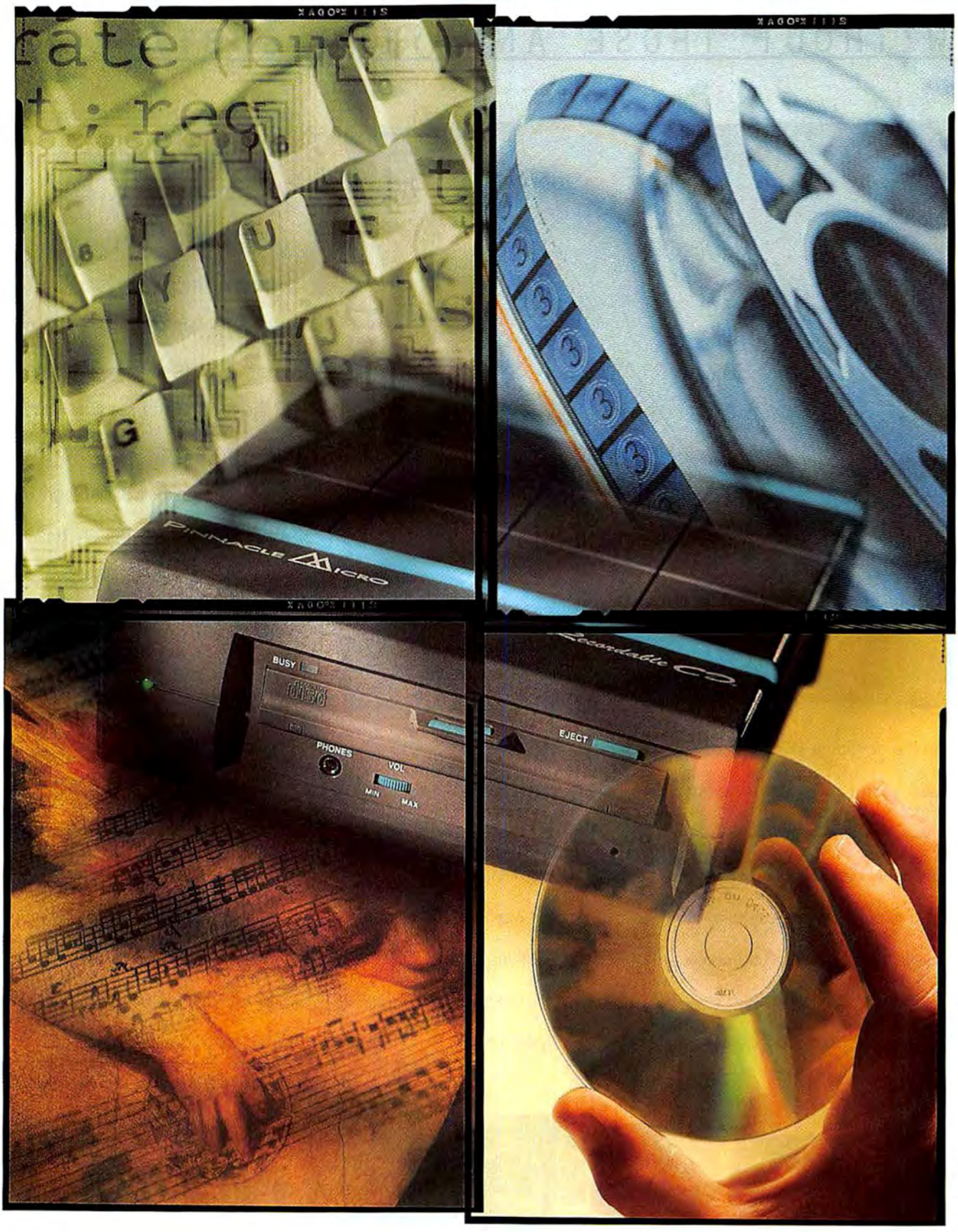

TOM COLLICOTT

NEW DRIVES LET YOU RECORD YOUR OWN DISCS FOR 7 BUCKS A POP.

JUST DON'T EXPECT IT TO BE EASY.

Do-It-Yourself CD-ROMs

By Jeffrey Gordon Angus and Carla Thornton

IMAGINE A WORLD IN WHICH COMPACT DISCS are used for everything from playing multimedia presentations to backing up hard drives to sending all the relatives vacation pictures. With CD-recordable drives moving into the mainstream, it's no fantasy.

Only 18 months ago, most CD-R hardware-and-software systems cost about $6000, a big price even for small businesses to pay for making CDs. Blank discs were $30 apiece. To add insult to grand larceny, the software was almost impossible to figure out. Now, as CD-R vendors aim for a wider audience, they're scrambling to make their products more appealing. Some new CD-recordable systems cost less than $1000, and blank discs are available in bulk for about $7 each. With an in-house production system consisting of the CD-R hardware and software, a fast PC, and a dedicated hard drive, an experienced user can record a CD-ROM in an hour or less. As long as you don't need more than a few dozen discs, producing your own CD-ROM is much faster and less expensive than using a service bureau.

But as we discovered in this review of seven hardware-and-software bundles, CD-R has a long way to go before it's as user-friendly as some vendors would have you believe. The software has improved overall, but only one package in our review—Corel's

CD Creator, bundled with the Smart and Friendly and Sony drives that we looked at—caters to novices, a first for CD-R systems. Hardware setup continues to be difficult for beginners to grasp as well, mainly because these drives require SCSI adapters. Every CD-R drive we tested required fiddling with IRQs or else came with the wrong drivers.

In the case of Pinnacle Micro's RCD-1000 drive, we had even more serious problems; for example, we were rarely able to record successfully at double speed, despite getting a replacement system from the vendor and changing our configuration several times. So if you think becoming a CD recording artist is going to be as easy as taping tonight's movie of the week, think again. Most of these systems are at least another upgrade or two away from the mass market.

Software Makes the Drive

For this review, we looked at external CD-R systems from JVC Information Products, Olympus Image Systems, Optima Technology, Pinnacle Micro, and Smart and Friendly, and internal systems from Hewlett-Packard and Sony. All priced under $1700, these bundles are well within the budgets of small businesses and home offices eager to try their hand at producing their own 650MB CD-ROM platters. They lack some of the high-end hardware features of more expensive CD-R systems. For instance, none records faster than double speed (2X, or 300 kbps), and none comes with built-in hard drives or tape drives, which make recording more convenient. But most have all the tools you need to create CDs in a variety of formats—data, audio, video, or combinations of the three. The software lets you collect files from one or more sources, arrange them in the order you like, then record, or *burn*, a disc in a single session or fill it up with multiple sessions performed over a period of time. Pop the finished CD into a player—either a standard CD-ROM drive or the CD-R drive itself, which can read when it's not recording—and you can see the recorded information as a directory, as on any hard drive.

To test these systems, we connected them to a Micron Pentium-90, using a SCSI adapter card supplied by each vendor when possible. Because CD-R is still a new technology, we paid particular attention to the out-of-box experience users will encounter. We noted how easy it was to install each bundle, then we used the software to burn a 550MB distributable database consisting of several hundred text and graphics files. To test each unit's multisession capabilities, we also burned 150MB of executable programs in three successive sessions on another disc.

In each case we were able to successfully record at 1X speed at least without encountering the dreaded *buffer underrun* (see the section "Burn-In Blues"). We got similar speeds across the board—about an hour to burn our 550MB database at 1X speed and about half that time at 2X.

Software is what really makes the difference in these bundles. We awarded Best Buys to HP's SureStore CD-Writer 4020i drive ($999) and Smart and Friendly's CD-R 1002 ($1259) on the strength of their software. HP bundles a nice selection of applications, including a simplified version of Incat Systems' Easy CD Pro, and Smart and Friendly comes with Corel's CD Creator, a must-have for novices. Three other drives also bundle versions of these two programs. Olympus's Deltis CD-R2/ISA external drive sells with Elektroson Gear, a powerful but arcane software package that beginners will probably want to avoid. JVC's Personal Archiver software is capable but not as friendly as CD Creator. All the software here is for Windows 3.1 but will run under Windows 95, except the version of CD Creator that ships with the Sony drive.

The ABCs of CD-R

Virtual image, physical image, ISO—what does it all mean? CD-R lingo can be daunting at first, but it's worth learning so that

BEST BUYS

CD-R premastering software, which lets you assemble and order information for copying to a CD, is critical to successful recording. Unfortunately, only a handful of today's premastering packages are designed for CD-R rookies. Our two Best Buys—an internal drive from Hewlett-Packard and an external system from Smart and Friendly—come with the best software for taking the hassle out of creating CDs. The $999 HP SureStore CD-Writer 4020i internal drive, sold with a basic version of Incat Systems' Easy CD Pro, among other utilities, takes a task-oriented approach. Its beginners' smorgasbord of task-specific programs—for viewing (but not writing) Photo CDs, archiving, and indexing—gives you a range of options without overwhelming you.

HP SureStore CD-Writer 4020i

Smart and Friendly's $1259 CD-R 1002 external drive comes with Corel's CD Creator, a terrific package for even the shakiest of beginners. CD Creator isn't as versatile as the HP bundle, but it writes a few more formats, including Photo CD, and it has the best interface and documentation of any CD-R software we've seen. All introductions to CD-R should be as inviting as Corel's.

Smart and Friendly CD-R 1002

you can make an informed buying decision.

One source of confusion for most greenhorns is the image most CD-R programs record from to protect you from buffer underruns. Most packages give you the choice of either a *physical* or a *virtual* image. Both save the time needed to look for files on the fly, but each has its trade-offs. A physical image is a file the CD-R program creates on your hard drive that is a bit-for-bit copy of what you want to record. When you burn a disc, the premastering software copies the real image sector by sector. The benefit is that it requires very little processing, so you're less likely to trash a disc because of a buffer underrun. The drawback is that a physical file takes up a lot of hard disk space.

What vendors call a virtual image can be a number of things. Most commonly, it's a small file that consists of pointers to every file and directory you want to record. Because your system still has to spend some time looking up files, a virtual image doesn't save as much processing effort as a physical image. On the other hand, it takes up much less hard disk space.

All the software packages here provide customization options for arranging your CD-bound information—creating, deleting, renaming, or moving files as you like without affecting the original data. If a file gets deleted from your recording source, a good program will warn you that it's missing before you record. (All the programs here do that.)

Another ease-of-use feature to look for in a CD-R software package is how smoothly it handles the ISO 9660 renaming process, which you'll need if you're making cross-platform CDs. (Any CD-ROM reader accepts ISO, the standard CD file format. If you don't rename your files to comply with ISO's special character requirements, some drives may not accept your discs.) The most flexible CD-R software gives you two options: manually renaming each offending file the program identifies, or telling the software to do it automatically (using a scheme akin to Win 95's tilde). Elektroson Gear and Easy CD Pro Multimedia are the only packages here that give you both options.

Burn-In Blues

Creating a CD with a CD-R system is like racing a Corvette on a twisting mountain road: one false move and it's all over. If your PC doesn't deliver information in a fast, uninterrupted stream, a buffer underrun occurs and the CD-R system aborts the session. Just like that. No second chances. You must start all over—with a fresh, expensive disc.

In the early stages of using a CD-R machine, it's inevitable that you'll ruin some discs as you get up to speed. But there are lots of things you can do to keep your costs down as you learn, ranging from having the right equipment (see "7 Recording Tips and Tricks") to using all the options your software offers for successful recording.

Your premastering software probably has several features to help you avoid the frustration of buffer underruns. Creating a physical or virtual image file on your hard disk is one. An image file not only allows for better throughput by gathering in one place all the information you want to record, but it also makes it quicker to burn more than one disc with the same data (such as a corporate directory or a multimedia title).

Some CD-R software also offers a simulation mode that lets you check in advance whether the real session will run smoothly. You can even have the software write the session to your hard disk, then access it as if it were a CD. Almost every software package in this review offers both image and simulation tools. Eventually, however, simulation will probably disappear as discs become cheaper and it becomes more economical to risk an unsuccessful recording session than to spend time simulating one.

7 RECORDING TIPS AND TRICKS

1 Use a fast PC. Premastering a CD-ROM is CPU intensive. At a minimum, you'll need a 486DX2-66 with 16MB of RAM. Make sure no other application is running in the background.

2 Place the data you want to record on a separate hard drive. You're likely to get better results if you dedicate a fast SCSI hard drive to hold the data. It should be at least 1GB and have a CD-R–dedicated SCSI adapter. One more thing: Make sure the hard drive doesn't rely on *thermal recalibration*, a process that adjusts head tracking to compensate for temperature changes. Recalibration causes the drive to hesitate for only an instant, but it's long enough to interrupt a recording session.

3 If you plan to use a premastering package different from the one bundled with your CD-R drive, be sure it has drivers for your hardware. You can usually, but not always, find a list of supported hardware on the packaging.

4 If you have a spare drive bay, consider getting an internal CD-R. It's much tidier than coping with cables and the additional surface area an external unit requires.

5 The biggest setup challenge is not the CD-R drive but the required SCSI adapter. Be ready to spend some time figuring out SCSI IDs, device interrupts, and base memory addresses, as well as getting the newest device drivers from your SCSI supplier. We had the least trouble when we assigned the CD-R adapter IRQ 9 or 10.

6 When installing the EZ-SCSI drivers that come with Adaptec adapters, run the DOS install first, then run the Windows install, or your drive won't work. This nonintuitive requirement is not well documented.

7 Buy from a vendor that provides toll-free support and long support hours so you'll have someone to turn to during installation and as you get up to speed.

Jeffrey Gordon Angus is a systems analyst and business consultant with The Data Works in Seattle. Carla Thornton is senior reviews editor for PC World. *Senior Associate Editor Michael S. Lasky contributed to this article.*

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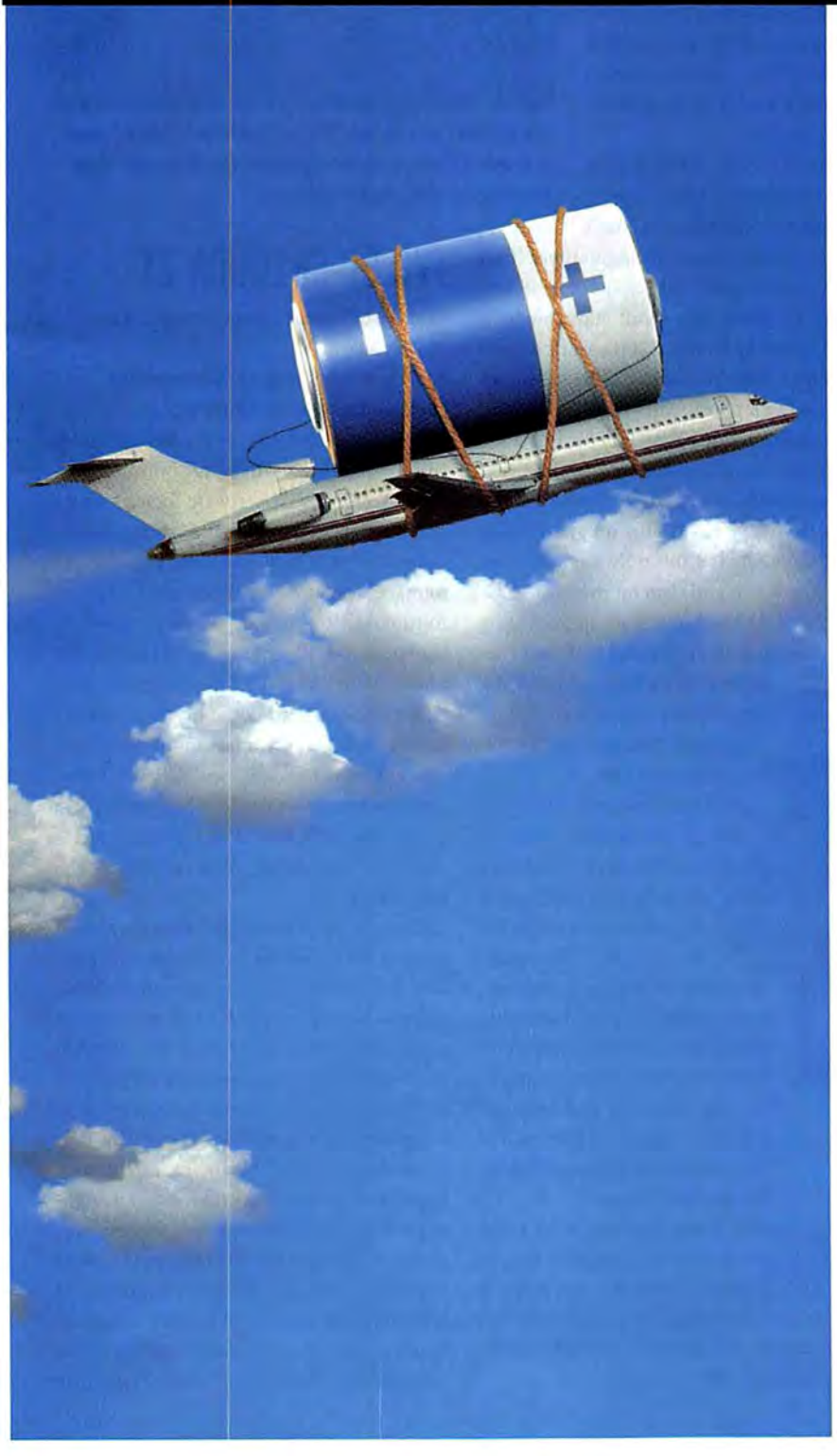

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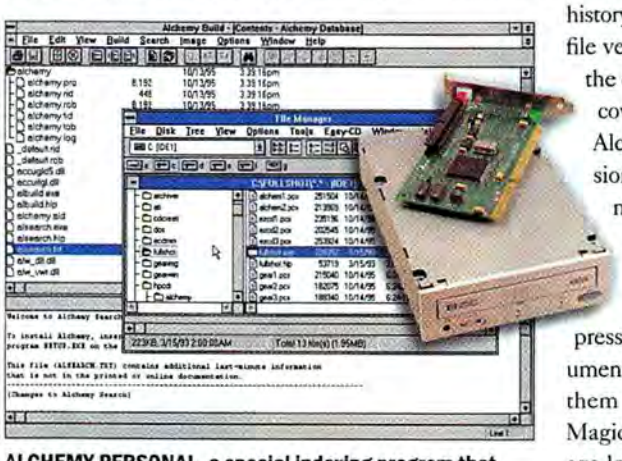
HP SureStore CD-Writer 4020i

BUNDLED SOFTWARE: Easy CD for HP 2.0, Easy CD Audio 1.5, Alchemy Personal for HP 3.0, Magic Lantern for Photo CD 2.0 for Windows 3.1
PROS: Easy-to-use task-specific software, low price
CONS: Writes few formats

With its set of separate miniapplications, the HP SureStore CD-Writer 4020i, one of our Best Buys, distinguishes itself from the other packages here, which limit their bundled software to one premastering program. The software doesn't have a lot of high-end features, but it's a good choice for users primarily interested in basic, quick archiving and indexing. It did well in our performance testing, almost always recording at 2X speed. And at $999, this bundle is one of the least expensive CD-R systems you'll find.

The internal SureStore CD-Writer drive fit into our PC easily, and we had only one problem installing the software—the installation routine wasn't sophisticated enough to catch our mistake of not installing SCSI drivers first, so it took us a while to figure out why the drive wouldn't work. Overall, the documentation is very useful, thanks primarily to a strong task-oriented structure and a good glossary.



ALCHEMY PERSONAL, a special indexing program that comes with HP's SureStore drive, copies a royalty-free search engine onto each CD you create with it.

The main program, Easy CD for HP 2.0, is a stripped-down version of Incat Systems' Easy CD Pro Multimedia 3.0 for Windows 3.1, versions of which are bundled here with two other drives (Optima's DisKovery 650 CD-R and Pinnacle Micro's RCD-1000). This simplified archiver actually integrates itself into the Windows File Manager, so you can access the CD-R as a recording device on File Manager's drive button bar.

Oddly, Easy CD for HP can't drag and drop files into your image file the way most other programs we reviewed can. But selecting files and then using a pulldown menu to save them is just as easy.

Some of Easy CD's limitations reflect its emphasis on archiving. For instance, you can't save recording session configurations. This ability makes repeated backups of an identical set of directories more convenient; it could come in handy if, for example, you wanted to make multiple CD-ROM copies of the same report for all your district managers. Neither does Easy CD for HP write very many formats compared to the other packages here—only basic data and audio (with its Easy CD Audio program), plus CD-ROM/XA. It's the only package that can't mix audio and data on the same CD. But Easy CD has many sensible recording tools that make it appealing, such as a file-history list that shows you all the file versions you've recorded, in the event you ever need to recover an old one.

Alchemy Personal, HP's version of Information Management Research's Alchemy 2.0 indexing and browsing software, is a nifty little program for compressing spreadsheets and documents onto a CD and indexing them for searching later. The Magic Lantern software package lets you view and manipulate (but not write) Photo CDs in a number of ways, including making slide shows.

HP's support is competitive with most others': It doesn't provide a toll-free line, as JVC, Olympus, and Sony do, but it has a short turnaround policy (two days) for repairs. *Hewlett-Packard Co., 800/810-0134.*
Reader service no. 788

THE CLUNKY SPREADSHEETLIKE WINDOW in JVC's Personal Archiver departs from the popular File Manager–style interface for building CD contents.

JVC BC-CR1000A-2X

BUNDLED SOFTWARE: Personal Archiver 3.51 for Windows 3.1
PROS: Inexpensive, performs incremental writes
CONS: Hard to install, arcane interface

As the name suggests, JVC's $999 external BC-CR1000A-2X drive and bundled Personal Archiver 3.51 software focuses on archiving data. That said, the system nevertheless records in all the most popular CD formats, such as mixed mode and CD+. Unfortunately, this is not an easy bundle to learn and use. We spent a lot of time on the phone with JVC's technical support staff while we were getting the hardware set up, and Personal Archiver has an interface only a computer nerd could love. The documentation is average overall—a little skimpy in places, but sufficient. The hardware manual does a very good job of describing the recording process.

Personal Archiver's interface is sparse, without a lot of productivity-enhancing frills. You must work from a spreadsheetlike screen to compose the CD image—unlike the graphical trees other packages offer. On the bright side, JVC's bundle is a good performer: We had no problems getting it to complete our test burns successfully. Personal Archiver also has many of the nice functional touches found in most of the other packages here. For instance, you can save your settings as definition files, so you don't have to go through the arduous process of rebuilding the same data set. JVC's support hours are the shortest here—only 8 hours per weekday—and its turnaround policy for

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hardware repairs is the worst: up to five days, compared to a couple days for most of the others. But it's one of the few vendors to offer a toll-free line, an important consideration with a package that takes some time to learn. *JVC Information Products, 714/261-1292.* **Reader service no. 789**

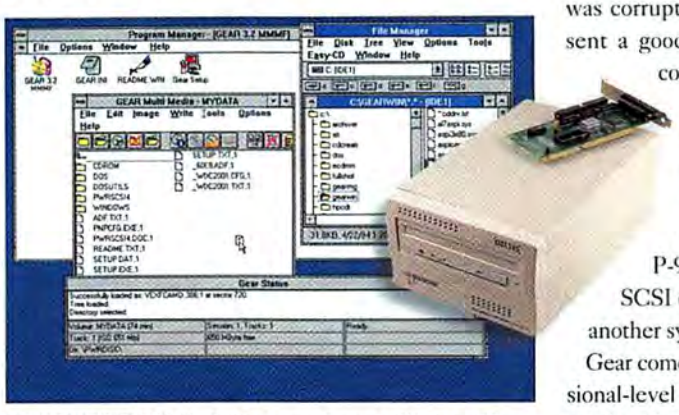
Olympus Deltis CD-R2/ISA

BUNDLED SOFTWARE: Elektroson Gear 3.23 for Windows 3.1

PROS: Sturdy external system with power-user software, solid documentation

CONS: Software difficult to decipher

The Elektroson Gear premastering program, bundled with Olympus's external Deltis CD-R2/ISA drive for a reasonable $1389, is up for any task—from creating a simple data-only CD to burning any combination of data, audio, and Photo CDs—as long as you're up to figuring out how to do it. This six-year-old package writes more major recording formats than any other package here. And Olympus has patched some ease-of-use enhancements onto this old-timer, including a drag-and-drop File Manager–like interface. But some confusing menu items and design elements remain, including a dry, statistical status section that's the antithesis of CD Creator's easy-to-grasp graphical status bars.



OLYMPUS'S DELTIS includes powerhouse software with drag-and-drop session creation. But users may be put off by cryptic menus and a too-technical status panel.

With its unusual cubist design, the CD-R2/ISA looks a little like a tape drive, but it fit fine on top of our PC's tower case (this was as far from the computer as we could place it using the included 2-foot SCSI cable). Before we could successfully install the drive, we had to work through a couple problems with the bundled Future Domain SCSI card. The first installation disk we got was corrupted. After Olympus sent a good disk and we still couldn't install the drivers, we realized the Future Domain adapter does not work with our test PC, a Micron P-90. An Adaptec 1510 SCSI card borrowed from another system worked fine.

Gear comes with some professional-level tools no other package in this group has. In keeping with its availability on multiple platforms, the software gives

ONE DRIVE, MANY FORMATS

One reason for CD-R's growing popularity is its versatility. Depending on the premastering software used, one CD-R disc can hold multiple types of data. Most of the bundles we reviewed support a majority of the following standards.

FORMAT	DESCRIPTION
CD-Audio, also called Red Book	Oldest format for compact discs. Almost all CD-ROM drives can play audio CDs.
CD-Interactive, or CD-I, also known as Green Book	Philips' proprietary standard for its home entertainment players.
CD-ROM/XA	Combines compressed audio and data, like mixed mode, but interleaves them for smoother playback. This format is best for multimedia applications.
CD+, or CD-Enhanced	Similar to mixed mode, but audio tracks are laid down first, a method that prevents an audio CD player from attempting to read data tracks and possibly damaging the speakers.
HFS, or hierarchical file structure	Macintosh native file format. PCs cannot read HFS discs, but Macs can read ISO discs.
Hybrid discs	Contain more than one directory or file structure, typically an ISO and an HFS session, for use on either a Mac or a PC. It's best to create hybrids on a Mac because you have more software choices.
ISO 9660, also called Yellow Book	Standard CD-ROM format and directory structure. All DOS and Windows CD-ROMs are based on this format.
Mixed mode	Combines Red Book audio and CD-ROM data. The first track must be data but may be followed by CD-Audio tracks.
Photo CD, or Beige Book	Proprietary multisession format developed by Kodak for distributing high-quality photo images. It requires a CD-I or CD-ROM/XA unit for playback.
Video CD, or White Book	Embeds MPEG-1 video and audio to play movies. It requires a CD-ROM/XA, CD-I, or Karaoke CD player.

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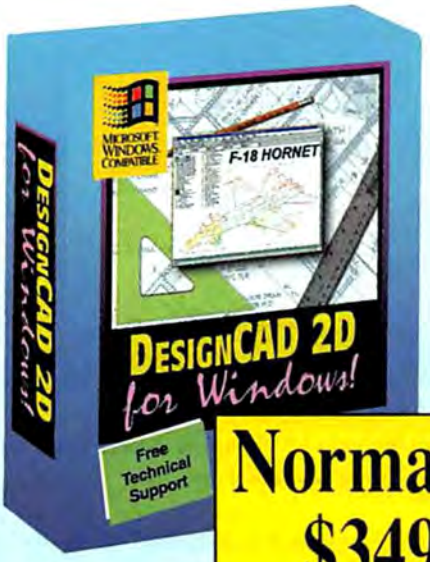

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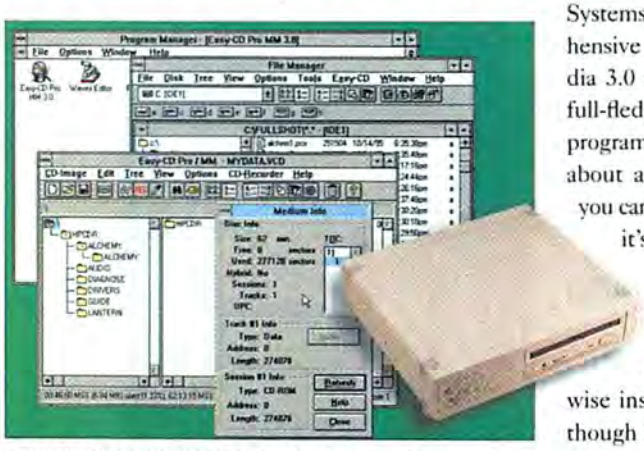
you more options for file naming than the other programs here, including ISO level 3, which allows long file names. Gear is also the only program that will do batch processing. You can write your own batch files or have the program record your actions during a session for use later, when you want to make another CD with the same data.

Another nice touch is Gear's support for disk description protocol, which lets you make a DAT copy of your CD's contents for a production house to use. A taped copy of the data isn't susceptible to the small physical imperfections a premastered CD often contains, so a duplicator is less likely to bounce your work back to you.



EASY CD PRO MULTIMEDIA 3.0 for Windows 3.1, bundled with Optima's DisKovery 650 CD-R drive, offers a nice combination of power and ease of use.

The more the shame, then, that Elektroson still has a way to go before Gear is as inviting as programs like CD Creator or Easy CD for HP. Arranging files in Gear's graphical session tree, for instance, is not as efficient as in the others—to change a file's location in the tree, you must delete it, then select it again from File Manager, instead of just moving it. (Elektroson says that's because Gear formats on the fly, saving you a step when you're ready to record.) And despite Gear's good documentation and context-sensitive dialog boxes, cryptically named menu items still trip you up. We finalized a disc before we were ready because Gear's Multisession and Disc Fixation menu options didn't do what we expected (leaving Multisession unchecked finalizes a disc; choosing Disc Fixation actually finalizes only one session, not the entire disc).

Olympus's support policies are average overall. The best aspect is its toll-free line, which you'll surely need while getting up to speed with the Gear software. *Olympus Image Systems, Inc., 800/347-4027.* **Reader service no. 790**

Optima DisKovery 650 CD-R

BUNDLED SOFTWARE: Easy CD Pro Multimedia 3.0 for Windows 3.1

PROS: Solid hardware bundled with professional-level software that's relatively easy to use

CONS: Expensive, doesn't come with SCSI adapter

Optima Technology's $1495 CD-R package combines a large external drive with Incat Systems' powerful and comprehensive Easy CD Pro Multimedia 3.0 for Windows 3.1. This full-fledged version of the Incat program is suitable for just about any CD creation chore you care to try, yet unlike Gear, it's fairly accessible for first-timers.

We received the wrong drivers for the hardware, but otherwise installation went well, although like Olympus, Optima skimped on the SCSI cabling it sent to attach its drive to our PC. Support policies are only average: The hours for technical support are generous, but they're limited to weekdays and require a toll call.

Easy CD Pro Multimedia is a jack-of-all-trades and master of none; it's not optimized for any particular type of work, but this multipurpose package supports all the major formats and throws in some advanced controls that recording buffs will appreciate. One example is an extra menu option that lets you see a specified number of levels in the directory's hierarchy and view the contents in alphabetical order, by date, or by extension.

But Easy CD Pro does lack a few ease-of-use features commonly found in CD-R software. For instance, you can't save settings for reuse, except as a default from the most recent session. Easy CD Pro has a simulation mode (called the predictor) that lets you perform a dry run of a burn to see if it will succeed. But it won't work on Pentium machines, and the next release will phase it out, primarily due to customers' dwindling dependence on it, according to Incat.

Judging from its performance, the Optima doesn't need a simulation mode anyway—it aced both our data sets, with none of the buffer underrun problems experienced by most of the other systems here. It always gracefully recorded at its maximum 2X speed. *Optima Technology Corp., 800/411-4237.* **Reader service no. 791**

Pinnacle Micro RCD-1000

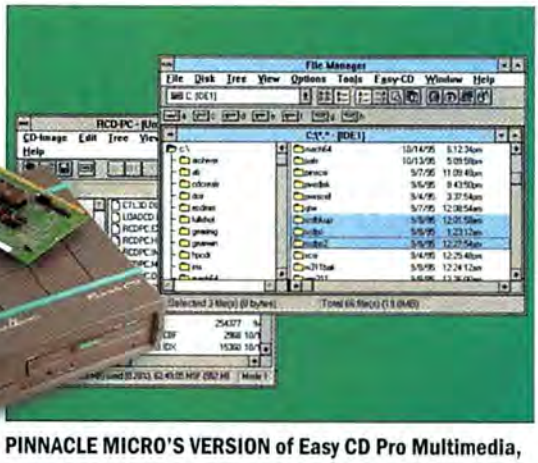
BUNDLED SOFTWARE: Pinnacle RCD-PC 3.0 Multimedia, RCD-PC Backup Utility for Windows 3.1

PROS: Good price, RCD-PC is largely based on able Easy CD Pro Multimedia software

CONS: Doesn't work with Windows for Workgroups, has problems recording at 2X speed

Pinnacle Micro's $1050 RCD-1000 is a handsomely designed external drive bundled with RCD-PC, a customized version of Incat Systems' Easy CD Pro Multimedia 3.0 software, and a backup program.

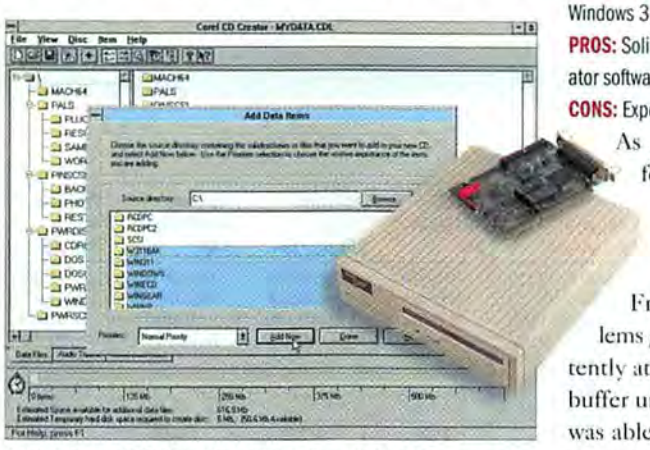
The Pinnacle comes with almost the same software as the Optima DisKovery—RCD-PC has the same benefits as Easy CD Pro, including its intuitive Windows File Manager drag-and-drop approach, and the same drawbacks—and the system costs several hundred dollars less. Unfortunately, we had many problems getting the Pinnacle to



PINNACLE MICRO'S VERSION of Easy CD Pro Multimedia, which it calls RCD-PC, offers the same File Manager–style drag-and-drop session creation as competing packages.

record at 2X and work under Windows for Workgroups. Even after we turned off the progress monitor—an action the documentation suggests might help prevent buffer underruns—we continued to waste platters. To burn a CD at 2X speed, we finally had to use a SCSI hard drive supplied by the vendor. We were able to solve a mysterious OS incompatibility only by switching to Windows 3.1. Pinnacle couldn't pinpoint the cause of either problem.

The only thing that marred the Pinnacle's installation was a finicky driver that came with the Adaptec SCSI card. The board's default IRQ setting conflicted with that of our test unit's PCI video card. Pinnacle's hardware documentation, like that of most of the others, explains only the bare essentials. But the software manual and online help are terrific. The manual not only does a fine job of describing the application by function, it covers the technology's standards and history clearly. Pinnacle's support policies are average. Support lines are open 11 hours a day, but you can't get help on the weekends and calls are on your own dime. *Pinnacle Micro, Inc., 800/553-7070.* **Reader service no. 792**



BUILDING A DISC'S CONTENTS is fun with the Smart and Friendly CD-R 1002—CD Creator's graphical status bar shows exactly how much space you have left.

Smart and Friendly CD-R 1002

BUNDLED SOFTWARE: Corel CD Creator 1.0 for Windows 3.1

PROS: Best software available for beginners, reliable performance at top recording speed, good price

CONS: Software not designed for mass production (titles, databases), some installation headaches

The external Smart and Friendly CD-R 1002 drive, bundled with Corel's impressive CD Creator for $1259, earns the other Best Buy in our review for its ability to handle a wide range of recording tasks without intimidating first-timers. The only software here that uses a Microsoft-style wizard, CD Creator takes you through a series of question-and-answer dialog boxes about the premastering procedure. CD Creator is also the only program we looked at that offers a special drawing program to design art for jewel boxes.

The CD-R 1002 put us through some of the same SCSI device tantrums as the other bundles. The software was easy to install, but we were surprised to find that CD Creator demands at least 515K of free DOS memory (525K is recommended). To make more conventional memory available on our computer, we had to disable our disk cache and replace the device driver for our PC's CD-ROM drive with a special driver supplied by Corel. CD Creator's documentation is outstanding. We like its layered organization, which separates the advanced topics from the simpler tasks you need to get up and running. It also does a nice job of covering technology issues and standards. Smart and Friendly's support policies aren't the most generous of the products here—you're on your own on the weekend and you pay for technical support calls—but they're adequate.

CD Creator is the only CD creation software package we looked at that doesn't give you the option to build a physical-image file. According to Corel, CD Creator covers the buffer underrun problem by sensing when one is about to occur, then closing the current track, reloading the buffer, and opening a new track, which allows the laser to continue to write.

Whatever CD Creator does under the hood, it seemed to work for the Smart and Friendly drive. We had no problems getting the system to record at the top rate of 2X consistently. *Smart and Friendly, 800/959-7001.* **Reader service no. 793**

Sony Spressa 920

BUNDLED SOFTWARE: Corel CD Creator 1.01B for Windows 3.1

PROS: Solid hardware bundled with easy-to-use CD Creator software; comprehensive support policies

CONS: Expensive, does not come with adapter card

As a cocreator of the compact disc format, Sony should be at the top of the CD-R system manufacturing game. But the product isn't as good a value as the Smart and Friendly. For one thing, we had problems getting the Spressa to record consistently at 2X, despite CD Creator's unique buffer underrun preventives. The Spressa was able to record most of a platter at 2X when handling small file sets, but it balked when we tried this with our 550MB data set.

The Spressa also costs several hundred dollars more than the Smart and Friendly bundle (Sony quoted us $1699 as a list price, but we found the bundle being sold for as much as $2200). And it doesn't even come with an adapter (although buying your own card adds only about $80 to your expense).

Hardware installation of this internal drive went more smoothly than it did with the others, but only because by now we had become practiced at anticipating these SCSI drives' peculiar (and often undocumented) demands. We got the same great CD Creator documentation with this CD-R drive as

CD CREATOR is also bundled with the Sony Spressa 920 drive. Its unique wizard is great for walking first-timers through the process of building and burning a CD.

we did with the Smart and Friendly system.

CD Creator is a pleasure to use, with its appealing graphical approach to the recording process. As you build your disc's contents, the program's status bar uses light gray to indicate data, and different colors (depending on the track) for audio. As you burn a disc, another status bar shows in percentages how far along you are.

Sony's support policies for its CD-R bundle are the most impressive here. Not only is Sony one of only three companies to provide a toll-free line (along with JVC and Olympus), its technicians stick around longer to take your calls—15 hours a day during the week, plus 8 hours on Saturdays.

At press time the company was the only one without a repair turnaround policy, but Sony says a two-day policy will be in place by the time you read this. *Sony, 800/352-7669.* **Reader service no. 794**

FEATURES COMPARISON Easy-to-Use CD-Recordables Sacrifice Some Features

● = Yes ○ = No
n/a = not applicable

Hardware	HP SureStore CD-Writer 4020i	JVC BC-CR1000A-2X	Olympus Deltis CD-R2/ISA	Optima DisKovery 650 CD-R	Pinnacle Micro RCD-1000	Smart and Friendly CD-R 1002	Sony Spressa 920
Bundled software	Easy CD for HP 2.0, Easy CD Audio 1.5, Alchemy Personal for HP 3.0, Magic Lantern for Photo CD 2.0 for Windows 3.1	Personal Archiver 3.51 for Windows 3.1	Elektroson Gear 3.23 for Windows 3.1	Easy CD Pro Multimedia 3.0 for Windows 3.1	Pinnacle RCD-PC 3.0 Multimedia, RCD-PC Backup Utility for Windows 3.1	Corel CD Creator 1.0 for Windows 3.1	Corel CD Creator 1.01B for Windows 3.1
Street price	$999	$999	$1389	$1495	$1050	$1259	$1699 [1]
Hardware features							
Model tested	internal	external	external	external	external	external	internal
Width x depth x height (inches)	n/a	10.4 x 10.4 x 2.8	6.8 x 10.8 x 4.7	11.4 x 10.2 x 2.5	8 x 10 x 2	9.7 x 10.5 x 2.5	n/a
Bundled adapter	Advansys 5150	Adaptec 1510	Future Domain TMC 1610	○	Adaptec 1520	Adaptec 1540CF	○
Software-upgradable firmware	●	●	○	○	●	○	●
Alternate model/street price	○	internal/$949	○	○	internal/$1100	internal/$999	external/$1900 [1]
Software features							
Formats software can write to							
ISO 9660	●	●	●	●	●	●	●
HFS	○	●	●	●	●	○	○
CD-Audio	●	●	●	●	●	●	●
Mixed mode (audio and data)	○	●	●	●	●	●	●
CD+ (CD-Enhanced)	○	●	●	●	●	○	○
CD-ROM/XA	●	●	●	●	●	●	●
CD-Interactive	○	○	●	●	●	●	●
Video CD	○	○	●	○	○	○	○
Photo CD	○	○	●	○	○	●	●
Other recording capabilities							
Physical image	●	●	●	●	●	○	○
Virtual image	●	●	●	●	●	●	●
Drag-and-drop interface	○	●	●	●	●	●	●
Platforms besides Windows 3.1 available	○	DOS, Mac, OS/2, UNIX, Windows NT	Mac, OS/2, UNIX, Windows 95, Windows NT	Mac	Mac	Mac, UNIX, Windows 95	Mac
Service and support							
Free unlimited support	●	●	●	●	●	●	●
Toll-free phone support	○	●	●	○	○	○	●
Weekday phone support hours/weekend support	9.5/○	8/○	11/○	11/○	11/○	9/○	15/● [2]

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[1] List price.
[2] Saturdays only.

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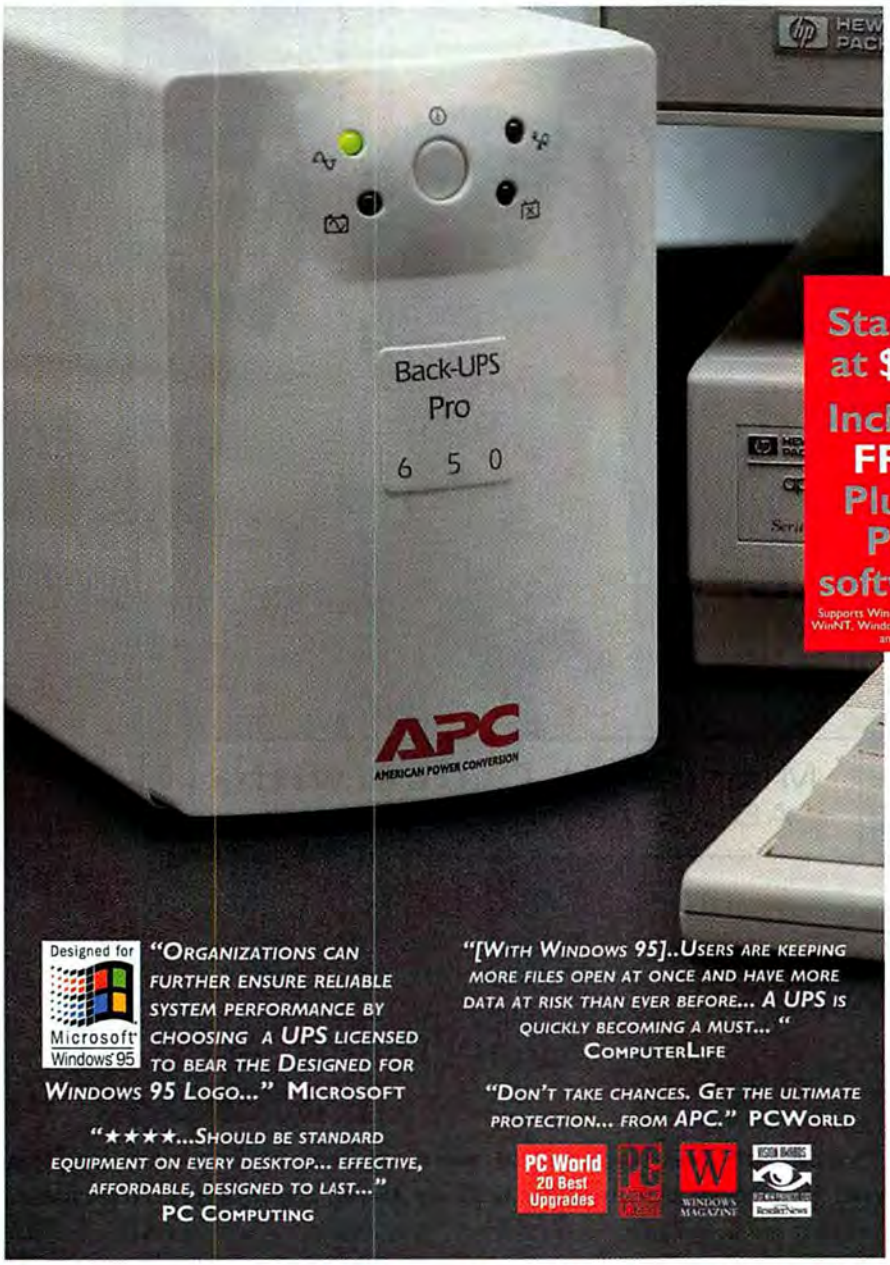
Windows® 95 puts the power of a server on your PC. The new Plug & Play Back-UPS® Pro™ will keep it there...



Plug & Play

If you're about to invest in a new multi-tasking operating system like Windows 95, experts say it may be time to invest in APC protection. Why? Because bad power is the largest single cause of data loss, and on a multi-tasking system, your vulnerability is multiplied. When full protection is as affordable as a new mouse, it just doesn't make sense to leave your premium machine unprotected.

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Protect against the inevitable power hit with new Back-UPS Pro, the one and only UPS designed for Windows 95. Automatic Voltage Regulation (AVR) provides the edge you need for full protection against extended brownouts or overvoltages without draining the battery, while CellGuard™ intelligent battery management extends battery life with fast recharge and deep discharge protection. The units even include built-in 10Base-T network cable/phone line surge protection for a bulletproof response to anything Mother Nature or Murphy's Law may send in your direction. Plus they're even backed by an up to $25,000 guarantee against surge damage to your equipment (see details).

All in all, you can't make a bad choice when you choose the company that protects more PC's than all other UPS vendors combined: APC.

For 6 minutes of runtime on a typical 486, choose BU Pro 280PNP. For Pentiums or more runtime, choose the BU Pro 420PNP or 650PNP. Call for a Free demo Disk, 60-page catalog, or visit our PowerPage™ at http://www.apcc.com

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CONSUMER SURVIVAL GUIDE

The Digital Advocate

Finances need fixing? Looking for legal advice? Want to file a complaint? Help is just a keystroke away. By Leslie Crawford

Have you ever found yourself wondering if your pickup truck was included in that fire-danger recall you heard about? Did you ever wish for a consumer advocate to help you after the gold on your brand-new "Rolex" watch washed off in the rain? Or have you ever had to pick your jaw up off the floor when a prospective lawyer quoted her fees? If so, you know just how difficult it can be to get timely, accurate consumer information for a reasonable price.

Well, you're in luck. That PC on your desk can do more than just crunch a spreadsheet or fight a cosmic battle. It's also the consummate consumer resource, at once acting as your personal legal counsel, consumer advocate, and financial adviser. For this guide, we searched the Internet, commercial online services, and the latest in software and CD-ROM titles to find the most useful offerings. The list of resources includes information on preparing a will without a lawyer, making educated purchases, protecting your rights, planning your financial future, finding out what's happening in Washington, D.C.—even voicing your opposition.

But this isn't a static list. New CD-ROM titles are introduced daily, and there's no end to the number of new online sites. Some caveats, though: Be cautious about free advice and unbelievable offers. Many people use online services to fleece the unsuspecting. So always consider the source of any advice, and keep a sharp eye out for digital con artists.

SYMBOL KEY

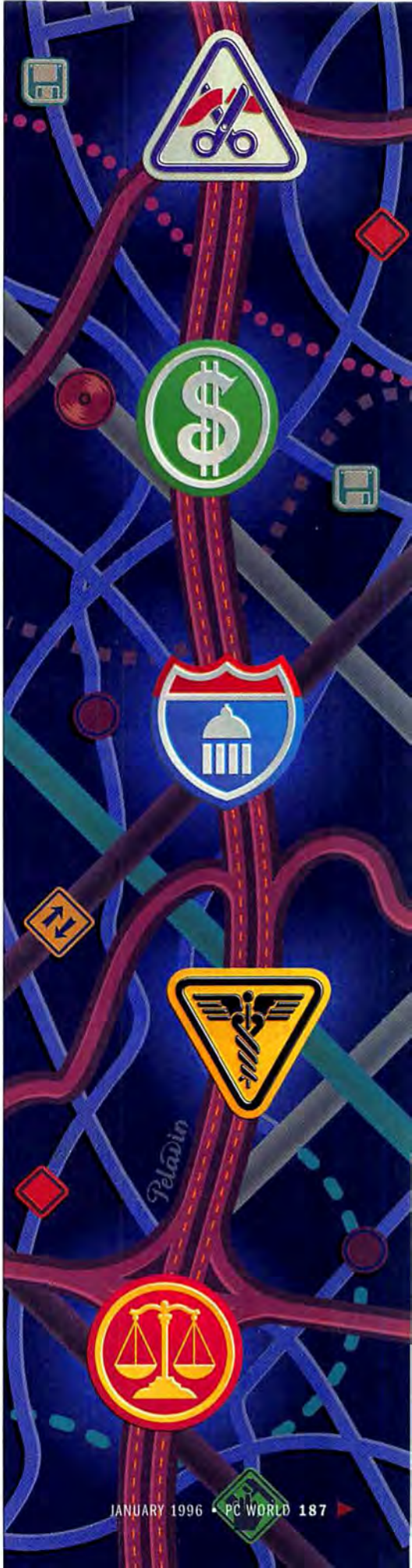
CD-ROM

DISK

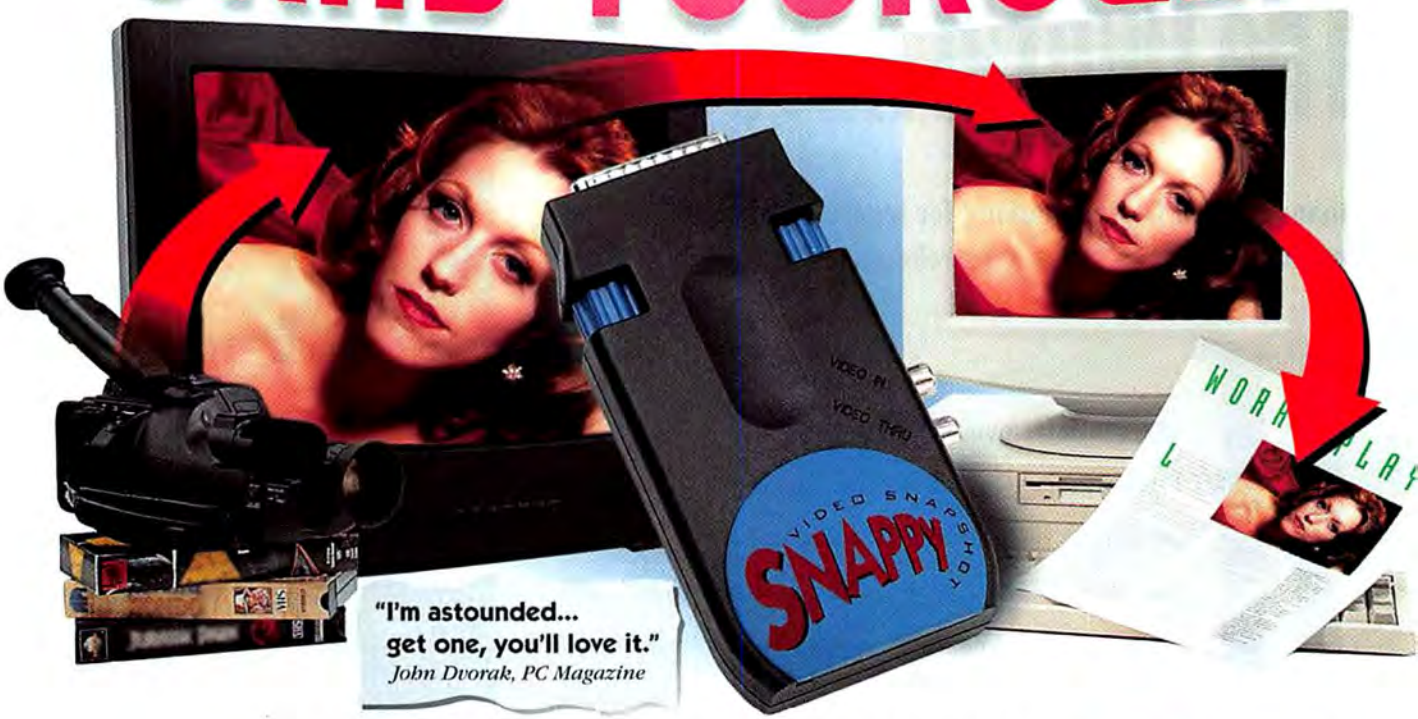
INTERNET

ONLINE

ILLUSTRATION: DANIEL PELAVIN



GRAB YOURSELF



SNAPPY Brings Stunning Pictures From Video Into Your PC

Snappy lets you grab sensational stills from any camcorder, VCR or TV right into your PC. It's easy! Just plug Snappy into the printer port on the back of your desktop or laptop PC. Then connect any video source to Snappy with the included cable. Watch the on-screen moving preview and when you see the picture you want, click *Snap*.

Snappy is guaranteed to grab the highest quality video stills you've ever seen on *any* computer at *any* price. Play's engineers developed a sophisticated new chip called the HD-1500 that captures sensational images in 16.8 million vibrant colors at breathtaking resolutions up to 1500 x 1125. It's perfect for thousands of uses from desktop publishing, presentations, databases, and Internet images, all the way to PC photo albums, school reports, real estate imaging or just morphing your friends into your favorite celebrities grabbed from TV.

Includes Award Winning Software

Each Snappy includes **Fauve® Matisse SE**, the outstanding paint, retouching and titling program. You also get **Gryphon Morph™ 2.5**, the same morphing, warping and special effects software used on the cover of *Time Magazine*.

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Demo also available for direct download (at up to 28.8K bps) from Play's BBS at 916.983.3288. Although Snappy Video Snapshot is an odd name, it's a trademark of Play Incorporated anyway. All other trademarks are the property of their respective holders.
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Buyer Protection Plans

Nobody wants to get taken, but who has the time to research every purchase and chase down every potential swindler? Here are our picks for the best resources when you want to check out the quality of a product or company or find the right agency to help you seek recourse if you've been mistreated. Remember that Internet sites can change their addresses without notice; if the site you're seeking seems to have disappeared, use your favorite search engine to track it down.

Clark Howard's Consumer Survival Kit is light on glitz (the only multimedia effects are videos of Howard talking), but it's loaded with practical tips on finding bargains and avoiding scams. You'll learn how to save money on travel packages, avoid scheming telemarketers, and prevent your laundry service from taking you to the cleaners. The CD-ROM includes form letters for everything from filing a complaint or getting your landlord to make repairs to removing your name from mailing lists. You also get a handy list of consumer-related phone numbers and addresses, including ones for local Better Business Bureau offices and the Federal Trade Commission. Clark Howard's Consumer Survival Kit $29.95 street; The IBM Multimedia Studio; 800/426-7235.

The Consumer Electronics Forums (go **cefo-rums**) on CompuServe are divided into three categories: Video (**cevideo**), Audio (**ceaudio**), and General Electronics (**cegeneral**). These technical consumer-to-consumer forums are aimed at electronics aficionados fascinated by the minutiae of, say, faulty laser discs or cable theft laws. The forums also contain consumers' evaluations of major brand-name products, which can be helpful to the layperson.

The Consumer Forum on CompuServe (go **save**) offers information on everything from dangerous food additives to cash-saving coupons. You can browse through one of its many libraries to learn about recalls issued by the Consumer Product Safety Commission, resolving a complaint via the Office of Consumer Affairs, and preventing check fraud with the help of the Consumer Information Catalog. Also check out consumer advocate David Horowitz's Fight Back columns.

Consumer Reports, the last word in consumer product testing, is available and searchable on America Online (keyword **consumer reports**), Prodigy (jump **consumer reports**), and CompuServe (go **consumer reports**); CompuServe, however, doesn't post the complete product test results. The format varies from service to service. On America Online, for instance, the articles are divided into five categories: Automobiles, for new-car ratings and recall information; Electronics, which covers CD players, VCRs, televisions, and so on; Food & Health, offering advice on such topics as pesticides in baby food and eliminating asbestos from the home; Money, for subjects such as the best and worst ways to borrow; and Home & Workshop, which reviews everything from bicycle helmets to fire extinguishers.

Consumer World, located at **http://www.consumerworld.org,** is the ultimate consumer venue on the Internet, with more than 600 resources to choose from. Savvy browsers can find a low-rate credit card, search for a nearby ATM machine, look up dealers' invoice prices on cars, get low airfares, connect with Better Business Bureaus, look up toll-free numbers, and shop at online factory outlets. You can even research consumer laws and find related news sites. And the What's News section alerts you to current product recalls and lets you check out the daily edition of *Money* magazine.

The U.S. Consumer Product Safety Commission, an independent federal regulatory agency, has jurisdiction over approximately 15,000 types of consumer products—from automatic-drip coffeemakers to lawn mowers. The CPSC is the place to go if you want to report a faulty product or check into recalled items. Access the commission via Gopher (**cpsc.gov**) or send specific questions by e-mail to **info@cpsc.gov.**

KATHERINE LAMBERT

BERNICE FRIEDLANDER

Acting director, U.S. Office of Consumer Affairs

"It's really exciting what a valuable resource online services can be for consumers. That's why the U.S. Office of Consumer Affairs has been active in getting America connected. The world is really looking to the United States to push this technology forward."

Favorite places: The Consumer Information Center in Pueblo, Colorado, (**http://www.gsa.gov/staff/pa/cic/cic.htm** or **catalog.pueblo@gsa.gov**) has its publications online, including the *Consumers Resource Handbook*. And the Consumer Product Safety Commission site on the Internet (Gopher to **cpsc.gov**) lets you download information about product safety and recalls.

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PLUG AND PLAY	Designed for Microsoft Windows 95

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intel inside pentium™ PROCESSOR | SCO OK | yes NetWare Tested and Approved | MICROSOFT WINDOWS NT COMPATIBLE | yes UnixWare Tested and Approved | PC WORLD BEST August - November 1995 QUIN 354/P75

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Watch Your Wallet

We could fill a magazine with the multitude of programs and online services designed to help money jocks and investors increase their wads. Instead, we focus on the resources that offer solid advice for the average breadwinner. Note, however, that new financial forums are introduced almost daily; our picks represent the best products and online sources available at press time.

The American Association of Individual Investors (keyword **aaii**) is perfect for beginning investors who want to start taking charge of their finances. This AOL site helps you organize your financial portfolio, plan for retirement, buy insurance, and even deal with your stockbroker.

The Investors Forum is a CompuServe haven (go **invforum**) where experienced and green investors alike can join in on stock talk and discuss money matters. Check out the message section Novice Investor to glean advice on family financial planning and learn more about real estate, futures, and commodities.

Investor's RoundTable (go **invest**) is a lively forum on GEnie. It's a great online site for discussing money and investment strategies with others and for gleaning plenty of smart, free advice, regardless of your level of financial expertise.

Jonathan Pond's Personal Finance Planner features practical advice from a nationally recognized financial planning expert. It also simplifies the daunting task of organizing your financial portfolio. Interactive quizzes help you assess your financial situation and give you customized advice. Pond pops up now and again with bons mots on financial prudence. Jonathan Pond's Personal Finance Planner, disk $39.95, CD-ROM $49.95; Vertigo Development Group; 800/942-2848, 617/225-2065. **Reader service no. 741**

Mortgage and Financial Calculators, Information and Links (**http://ibc.wustl.edu/mort_links.html**) works out car or house mortgage payments, calculates how much you can reasonably spend on a house, and more. **Interactive Home Buying on the Web** (**http://www.maxsol.com/homes/calcsm.htm**) also calculates amortization schedules and mortgages and helps you compare fixed- and adjustable-rate options. **Mortgage Calculator** (**http://www.baynet.com/forms/mort.html**) and **Homebuyers' Fair Mortgage Calculator** (**http://www.homefair.com/homefair/mortcalc.html**) are tools for wannabe homeowners.

Personal Finance on America Online (keyword **finance**) is a good place to learn financial basics before moving on to confusing economic theories and complicated stock quotes. Among its highlights are the Wall Street SOS Forum, The Tax Forum, and AOL's Real Estate Center (keyword **real estate**). Or head to the Morningstar Mutual Funds Forum (keyword **morningstar**) for the latest information on those funds.

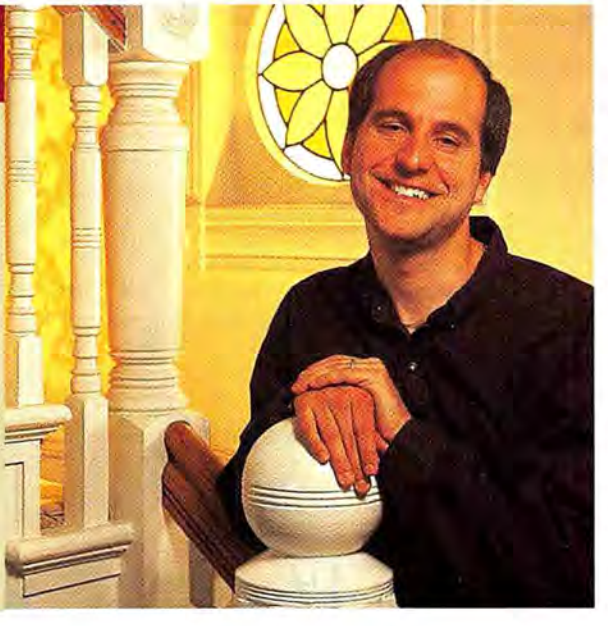
Personal Finance on Prodigy (jump **personal finance**) is a source of advice on taxes, borrowing money, banking, and securing a car loan. From there, hit the Money Talk bulletin board (jump **money talk**) to find and share tips on stocks and investing.

Quicken Financial Planner. Want to retire at 50? This CD-ROM puts you in the driver's seat. It's loaded with information about risk taking, allocating investments, reducing debt, and saving for retirement *and* the kids' college tuition. The program walks you through the process of creating a retirement plan, then develops an action plan for meeting your goals—from eating out less often to adopting a more aggressive investment strategy. Quicken Financial Planner $39; Intuit; 800/624-8742, 415/322-0573.

Your Money (keyword **your money**) is an AOL forum hosted by certified financial planner Richard A. Allridge. It's an ideal spot for getting practical guidance on individual debt and credit management, insurance, retirement, and estate planning. The Tips, Tricks & Scams area is a great meeting ground for sharing good deals and discussing rip-offs. Also handy is the data on financial publications and services, including names and addresses.

GERRY GROPP

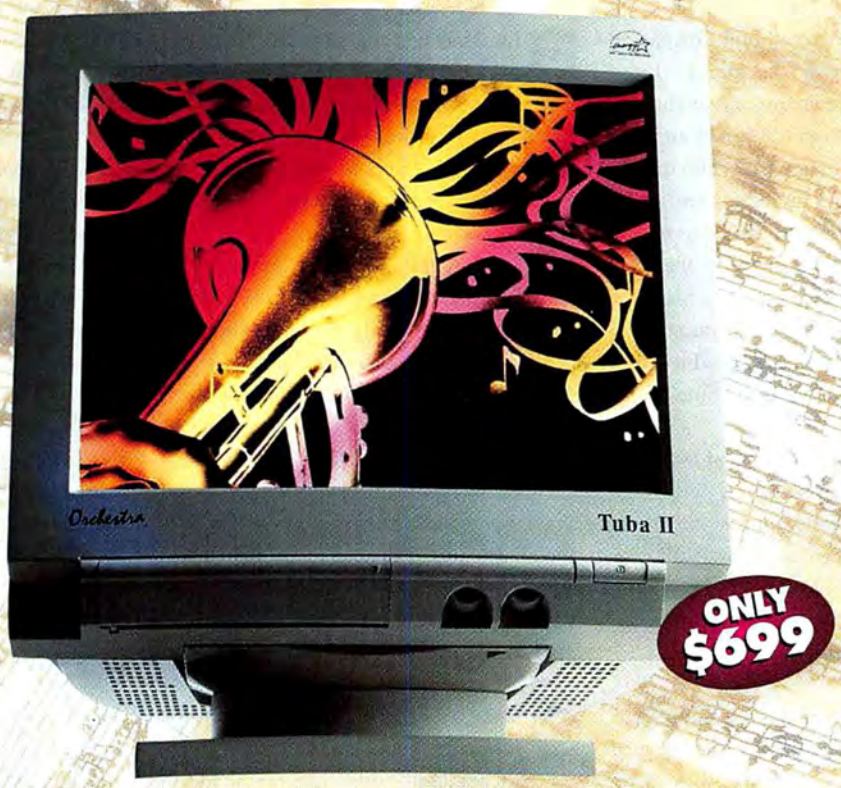
ERIC TYSON
Author, *Investing for Dummies*



"I will echo the advice your parents gave you: Don't believe everything you read—particularly online, where you can't even identify who you're chatting with. People can disguise who they are and their motives. They can be recommending things that aren't in your best interest. This is true in the real world, too, but it's compounded online by the anonymity."

Favorite product: "Quicken. I've always thought it was great for simplifying bill paying, tracking investments, and basic financial planning. And I like it even more now that I'm one of the experts featured on the 1996 version."

SWEET 17.



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Tilt/Rotation Control	•	•		•	
Pincushion Control	•	•		•	•
Color Balance Control	•	•			•
Color Temp. Control	•	•			•
Microprocessor Controls	•	•		PARTIAL	PARTIAL
On-screen Controls	•	•			•
Viewable Screen Size	15.9	15.9	15.9	16.1	15.9
Detachable 15 Watt Speakers		•			
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The Body Politic

There may be no better avenue for taking the pulse of the government, filing a complaint with a federal agency, or reaching your legislators than using online services. Although the resources profiled here are predominantly found online, we also discovered a useful CD-ROM that helps you shrink big government to fit on your desktop.

Federal Government: Executive Branch lets you search White House documents, peruse listings of cabinet-level departments, and get information on the EPA, NASA, and other agencies (**http://lcweb.loc.gov/global/executive.html**). You'll also want to check out the Library of Congress's Web page, particularly the Library of Congress Indexes to Other WWW Services, with links to a wealth of government resources (**http://lcweb.loc.gov/homepage/lchp.html**).

The FedWorld Information Network, sponsored by the National Technical Information Service, acts as a gateway to more than 130 publicly accessible government BBSs. The service's noteworthy consumer resources include BBSs for the Federal Communications Commission, the Health and Human Services Department, the Labor and State Departments, and even the White House itself—where you can read about bills, treaties, and executive orders. The Web address is **http://www.fedworld.gov/**; Telnet to **fedworld.gov**; or you can dial the FedWorld BBS at 703/321-3339.

Information USA features Matthew Lesko, the online world's answer to Ralph Nader, telling everything he knows about government services for the consumer. This award-winning CD-ROM holds three of Lesko's software packages: The Great American Gripe Disk, Federal Database Finder, and Federal Domestic Assistance. You can also find his advice on CompuServe's Information USA forum (go **lesko**), where he tells you how you can reach elected officials and put your tax dollars to work. Information USA $39 street; Infobusiness, Inc.; 800/657-5300, 801/221-1100. **Reader service no. 743**

Politics, AOL's spirited and heavily visited forum (keyword **politics**), is a terrific place to engage in political chitchat with other citizens. Post your opinions about current legislation and domestic and international issues on the message boards, or access the ACLU (keyword **aclu**) and C-SPAN (keyword **c-span**) online sites. You can also tap into a list of the e-mail addresses and phone and fax numbers of politicos, and you can send your gripes right to the president, vice president, and cabinet members.

Politics is a Prodigy service (jump **political**) that helps you find senators and representatives by name, party affiliation, special interest category, or congressional committee membership. You can also read biographies of members of Congress, see how your legislators voted on a particular issue, and research which special interest groups contributed to a campaign.

Social Security Online offers news, press releases, speeches, and legislation on Social Security issues. Policy handbooks are also available through this Web site. The page (**http://www.ssa.gov**) also links to other Social Security resources. In the Feedback forum, you can send concerns and complaints directly to the Social Security Administration—much less frustrating than waiting in line.

Thomas, created "in the spirit of Thomas Jefferson," is a Library of Congress Internet server that makes legislative information available to the general public. Visitors can, for example, bone up on how laws are made or peruse a database that contains House and Senate bills and e-mail addresses for all the senators and representatives. For access, **http://thomas.loc.gov/**.

White House Memo on Prodigy offers unedited White House briefings and transcripts of speeches (jump **whitehouse**). If you're ruffled by what you read, send a message directly to the White House at the provided e-mail address. Or try out the White House's own Web site, which not only lets you hear the plaintive meow of Socks the First Cat, but also invites you to send e-mail to the administration. For access, **http://www.whitehouse.gov/**.

KATHERINE LAMBERT

RALPH NADER

Consumer advocate

"The Internet is more than just a collection of databases. It's the interaction of a large community of people who see themselves as citizens rather than customers. The political activity on the Internet is a positive resurgence of democracy."

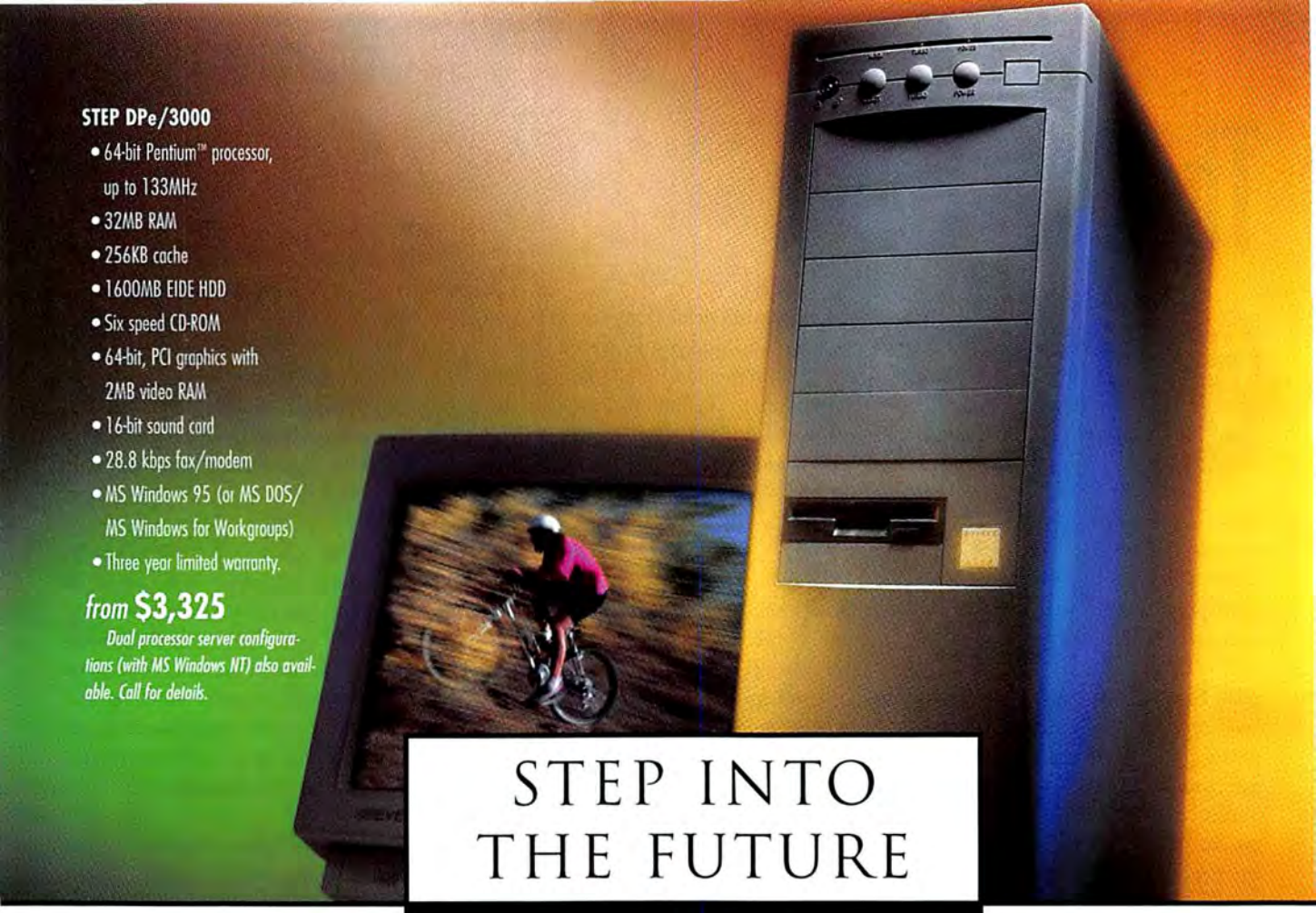
Favorite place: The Essential Information Gopher and Web site (**http://www.essential.org**) provides access to information from a number of citizens' groups.

STEP DPe/3000

- 64-bit Pentium™ processor, up to 133MHz
- 32MB RAM
- 256KB cache
- 1600MB EIDE HDD
- Six speed CD-ROM
- 64-bit, PCI graphics with 2MB video RAM
- 16-bit sound card
- 28.8 kbps fax/modem
- MS Windows 95 (or MS DOS/ MS Windows for Workgroups)
- Three year limited warranty.

from **$3,325**

Dual processor server configurations (with MS Windows NT) also available. Call for details.



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PC WORLD

Designed for Microsoft Windows 95

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WINDOWS MAGAZINE 1994 RECOMMENDS

yes It runs with NetWare

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- 64-bit Pentium™ processor, up to 133 MHz
- 16MB RAM
- 256KB cache
- 1275MB EIDE HDD
- Six speed CD-ROM
- 64-bit, PCI graphics with 2MB video RAM
- 3D sound card
- 28.8 kbps fax/modem
- MS Windows 95 (or MS DOS/MS Windows for Workgroups)
- Three year limited warranty.

from **$2,495**

Dual Processor server configurations (with MS Windows NT) also available. Call for details.

STEP Pro

- 64-bit Pentium™ processor, up to 133 MHz
- 16MB EDO RAM
- 256KB synchronous cache
- 850MB EIDE HDD
- Six speed CD-ROM
- 64-bit, PCI graphics with 1MB video RAM
- 16-bit sound card
- 28.8 kbps fax/modem
- MS Windows 95 (or MS DOS/MS Windows for Workgroups)
- Three year limited warranty.

from **$2,095**

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Legally Speaking

From the wide array of software and online advice, we culled our picks for resources that are easy to use and that help give nonlawyers a solid legal education.

The Internet Legal Resource Guide, a nonprofit Web site, is a good place to start (**http://uts.cc.utexas.edu/~juris/index.html**). Both legal experts and novices will find useful information, including indexes of nonprofit legal services, federal judicial rulings, and government resources.

Legal dot Net is a Web site that offers solid, one-stop shopping for practical legal info (**http://www.legal.net/**). Check out Legal Chat, a real-time forum for lawyers and laypeople looking to discuss the law. You can also access Legal Links, a directory to additional legal help on the Web.

The Legal Forum (go **lawsig**) is CompuServe's stomping ground for legal pros and laypeople alike. If you have a legal question, post it here. Though CompuServe stresses that subscribers shouldn't use this forum to solicit free legal advice, you can pick up info on anything from custody cases to copyright laws.

Legal Information Network on AOL (keyword **lin**) offers discussion topics in more than 150 folders. It has a folder for each state, as well as for topics such as Multimedia Law; Landlord-Tenant Law; and Probate, Estates & Trusts. You'll find a fair dose of legal gobbledygook but also plenty of material nonlawyers can understand.

LivingTrust Maker 2.0 is written by a team of lawyers committed to helping you save money in legal fees. It gives you more than just templates, guiding you through every choice in plain English. An outstanding package, it explains how living trusts fit into an estate plan and creates and prints out a living trust. Another Nolo winner, **WillMaker 6.0,** creates wills that are valid in every state except Louisiana. As a bonus, this Windows program helps you save money on taxes, resolve debts, and name an executor. LivingTrust Maker 2.0 $45 street, $55.96 direct, WillMaker 6.0 $40 street, $48.96 direct; Nolo Press; 800/992-6656, 510/549-1976. **Reader service no. 744**

Managing Your Money's Personal Attorney takes your responses to a series of straightforward questions and enters them in a master file. There the information is accessible to 16 legal forms, including a bill of sale, a demand letter for money owed, and a bad check notice. This process lets you quickly create ready-to-sign documents. The program has a good tutorial. Managing Your Money's Personal Attorney $9.95 street; Meca Software; 800/288-6322, 203/255-1441. **Reader service no. 745**

Nolo Press Self-Help Law Center (**http://www-e1c.gnn.com/bus/nolo/**) is an archive of *Nolo News* articles. You'll find fact sheets on legal topics, an update service that summarizes important court decisions, and a profusion of lawyer jokes. In addition, you can now access Nolo's Law Center through America Online (keyword **nolo**). Along with two Nolo publications, *Neighbor Law* and *Nolo's Pocket Guide to Family Law,* the site features sample chapters from Nolo books.

Personal Advocate generates more than 40 types of letters to credit, consumer, and government agencies, and its on-screen help answers questions about consumer rights. Best of all is the database of addresses for credit bureaus; state authorities; health, environmental, and social-welfare organizations; and Better Business Bureau and consumer protection offices. Personal Advocate $19 street; Parsons Technology; 800/223-6925, 319/395-9626. **Reader service no. 746**

Quicken Family Lawyer features a collection of expertly crafted letters, including credit rating challenges, debt demand letters, and complaints to the Better Business Bureau. It also gives you 61 legal documents and offers pointers on finding an attorney. Quicken Family Lawyer $29 street; Parsons Technology; 800/223-6925, 319/395-9626. You can also order a copy through CompuServe (go **parsons**). **Reader service no. 747**

San Francisco–based writer Leslie Crawford specializes in home and home office computing.

DAN PEEBLES

ROBERTA COOPER RAMO

President, American Bar Association

"People should be cautious about taking advice when they go online—anybody on the Internet can say they're a lawyer. But computers offer a remarkable opportunity. We're just starting to figure out how computing gives lawyers a better opportunity to communicate with clients."

Favorite place: Where else? The ABA's Web site (**http://www.abanet.org**), which includes related publications, events, and education. There's also a page on domestic violence and one on lawyer referral services. Coming soon: an e-mail directory, the ability to make secure purchases, and legal-topic discussion groups.

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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
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TO DO
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MEETINGS
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Software for the Perpetually Overworked

A personal information manager is essential for busy people. It can help you free up time, maintain contacts, maybe even stay sane.

THE TRICK: finding the package that matches the way you work.

BY PETER SCISCO

Admit it: Getting organized can seem like a pipe dream. One minute you're trying to find that phone number or figure out exactly when and where your next meeting is. Then *bang!*—the day is done, and your desk is a wasteland of sticky notes, phone messages, and half-completed address cards.

How to reduce the mess? If you've got Oscar Madison–style work habits, a personal information manager won't magically turn you into Felix Unger. You'll only be converting a paper-based disaster into an electronic one. But if you're willing to put a little effort into reaching neatness nirvana, the right PIM can help.

Different Users, Different PIMs

For this review, we evaluated a bevy of PIMs: Symantec's Act 2.0 for Windows, Franklin Quest's Ascend 5.0, NetManage's Ecco Pro 3.0, Elan's GoldMine 2.5a, Janna Systems' Janna Contact 95, Lotus Organizer 2.1, Microsoft's Schedule+ for Windows 95, and Starfish's Sidekick 95. Janna Contact, Schedule+, and Sidekick are the first three PIMs designed for Windows 95; the others here are Windows 3.1 products.

The PIM is coming into its own as a basic office application, a trend reflected in the fact that all three of the major office software suites now include one. (Lotus SmartSuite has Organizer, Microsoft Office 95 has Schedule+, and Novell PerfectOffice has InfoCentral, the last of which we cover in "More Ways to Get Organized.") These products' abilities to manage schedules, phone lists, and similar information have come to the fore as corporate America shed support staffers in a drive to cut costs.

More than any other type of application, PIMs stress the "personal" in personal computer. Some PIMs resemble spiral-bound paper organizers; others look like electronic address-card files. Target audiences also vary: Among the eight products reviewed here, you'll find PIMs aimed at everyone from casual users to high-powered salespeople.

Despite their myriad approaches, most PIMs fall into two broad types: time managers and contact managers. Time managers, which typically cost around $100, boast strong features for juggling the events that fill your calendar, and flexible to-do lists for tracking the tasks you need to complete. By contrast, contact managers (which can cost $200 or more) are optimized for the special needs of workers who deal constantly with customers and other people outside their own organization. Like time managers, these programs offer calendars, but their core feature is a sophisticated address book, with a focus on business relationships built on phone calls and follow-through.

Of the products in this roundup, Act, GoldMine, and Janna Contact are contact managers, and Ascend, Organizer, Schedule+, and Sidekick

PETER HOEY

are time managers. Ecco Pro is a chameleon that doesn't fit neatly into either category. To choose the one that's right for you, think about how your work gets done. If you live and die by your people connections, a contact manager makes sense. If, on the other hand, you're interested primarily in managing meetings, tasks, and deadlines, then a time manager is what you need.

If your business survives on teamwork, a workgroup PIM that can automatically check multiple schedules, find an appropriate meeting time, and send e-mail invitations can be invaluable. The only PIMs here that can't do this are Act, Janna Contact, and Sidekick.

Oddly, even PIMs with group scheduling usually don't excel at sharing other types of information, such as address books. While all the packages here except Ascend can distribute such data by letting you place shared PIM data on a network server, only Ecco Pro and GoldMine really make sharing such data easy and hassle free.

Time Management à la Windows 95

The three Windows 95 PIMs here take advantage of the new operating system's strengths—notably by integrating with the Exchange mail client—but they don't knock the best Windows 3.1 PIMs out of the running. In fact, our two Best Buys, Ecco Pro and Lotus Organizer, are Windows 3.1 applications. All of the Windows 3.1 PIMs reviewed here worked well with Windows 95 in our tests, and Windows 95–specific versions of them all are in the works.

Networked users should also consider other technical issues. You need a package that works with your e-mail and network setup, so your LAN manager should help choose the product that's best for your company.

Locating a PIM that's compatible with your hardware isn't hard, but finding one that's compatible with *you* requires work. Analyze your philosophies about organization, then narrow your search to products that share your outlook. If possible, try several before making a commitment. Selecting a PIM for workgroup use is especially tricky: No group PIM can do its job unless all the people in the office like it enough to use it.

Is there a perfect personal information manager? Sure. His name is Jeeves, and he's the all-knowing valet in the novels of British author P. G. Wodehouse. You can't hire Jeeves to run your affairs, but the right PIM can be the next best thing: a trusty assistant with a flawless memory and a personality that matches the way you work.

Peter Scisco is a freelance writer in Winston-Salem, North Carolina. Catherine Kenny is an associate editor and Harry McCracken a senior associate editor for PC World.

For more information about all products in this article, circle reader service no. 908.

Best Buys

Selecting a PIM for Best Buy honors is a tough job. These products' emphasis on the personal means one worker's intuitive interface is another's impenetrable gibberish. Product goals also differ widely—the field includes everything from simple schedulers to high-end contact managers.

That said, Lotus Organizer 2.1 is our choice as Best Buy for PIM newcomers and others who want to get up and running as quickly as possible. It's not the most feature rich contender, but you can start using most of its options—including group scheduling—right away, without cracking the manual. For its flexibility, power, and outstanding workgroup capabilities, Ecco-Pro 3.0 also gets a Best Buy, despite its sharp learning curve. Once you've mastered it, the program can be customized in almost any way imaginable to fit whatever business you're in.

None of the three contact managers—Act, GoldMine, and Janna Contact 95—qualifies as a Best Buy, but Act comes close. It's both powerful and easy to use; only its lack of group scheduling and weak document-management features keep it from grabbing the prize.

Act 2.0 for Windows

PROS: Strong contact management tools, built-in word processor, solid e-mail support

CONS: No automated workgroup scheduling, limited document management features

If you firmly believe it's who you know—rather than what you know—that matters, this $199 contact manager may be just what you need to stay well connected. Although it lacks group scheduling capabilities, Act is otherwise an indispensable, easy-to-use tool for salespeople, real estate agents, and others who rely on constant customer contact.

Unlike time managers such as Organizer and Schedule+, Act revolves around your address book rather than your calendar. Each appointment, project, and phone call is linked to a person in Act's contact database, and you can view a log of all the past activities associated with any person. Act is not quite as powerful as GoldMine, but it's friendlier, with an interface that always makes clear what your options are.

The program's address book imports data neatly and accurately, and a wide array of printed output options are also available, including the ability to generate reports, such as call reports for a sales team. Along with Sidekick 95, Act is one of only two products here that includes a simple built-in word processor, which you can use to quickly write, fax, or e-mail anyone on your contact list. You can also attach the letters you create to a contact's record, but that's the extent of Act's document management features—it won't let you associate, say, an Excel spreadsheet with a contact.

Symantec says Act users tend to be out on the road visiting customers, not at the office meeting with coworkers. That may explain why the package lacks built-in group scheduling. It can't automatically locate a block of time when everyone's free and a conference room is available, then notify attendees that a meeting has been planned. Act does interface nicely with popular e-mail systems, giving you an in-box and out-box as well as the tools you need to create messages and attach files, contact data, and schedule entries.

Act's focus on contacts may be an unnecessary complication if you just want a simple calendar and phone book, and its lack of group scheduling makes it unsuitable for handling in-house meetings. Still, it's a top

choice for independent types who rely upon business relationships to get the job done. *Symantec, 800/441-7234, 408/253-9600* **Reader service no. 711**

Ascend 5.0

PROS: Long-range goal-planning, built-in database and daily journal

CONS: Weak workgroup features, address book isn't customizable

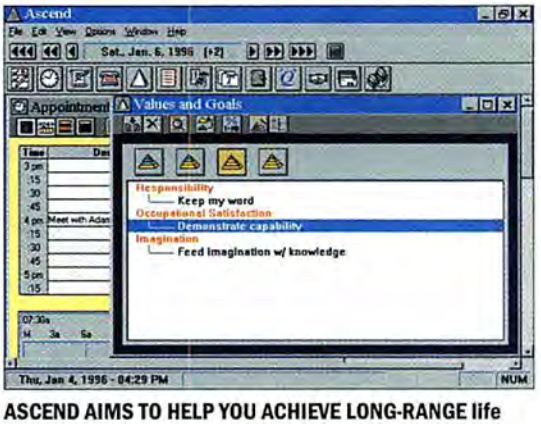
This $109 time manager comes from Franklin Quest, a leading manufacturer of paper-based organizers that views its products as a way to achieve personal well-being. You don't need to buy into this philosophy to use Ascend, but it will appeal primarily to folks who believe that daily tasks are organized most effectively as part of a long-range plan.

Given Franklin Quest's line of notebook organizers, you might logically expect Ascend to resemble a spiral notebook. Instead it more closely resembles Sidekick 95, but with a unique set of tools. These include a simple general-purpose database and a journal for recording thoughts and ideas.

Ascend's personal-improvement approach is reflected most strikingly in the way it helps you track both your personal goals and the short-term strategies needed to accomplish them. For example, you might define "sense of achievement" as a long-term aim and "conquer a debilitating habit" and "take a class" as intermediate steps toward accomplishing that aim; Ascend could then remind you each day about tasks related to these goals.

When it comes to more typical PIM features, Ascend does a respectable job of importing data and giving you control over printed output's look. However, there's no way to link outside files to calendar entries, and you can't customize the contact database's predefined fields.

Ascend's group-scheduling feature shows you everybody's schedules, finds available times, and and can reserve resources such as overhead projectors. The program also has a useful e-mail front end that lets you drag and drop meetings and tasks into mail messages. But Ascend has weak tools for limiting access to your calendar, and it's the only PIM here that can't share information other than data about schedules. *Franklin Quest, 800/877-1814, 801/975-9992* **Reader service no. 712**



MARK ALCAREZ

ASCEND AIMS TO HELP YOU ACHIEVE LONG-RANGE life goals, not just get you to your next meeting.

REAL PEOPLE AND THEIR PIMS

USER: Louise Reilly Sacco, marketing consultant, Needham, Massachusetts

SOFTWARE: Act 2.0

As a loyal Act user of three years' standing, Louise Reilly Sacco isn't about to change contact managers. Act is perfect for maintaining her network of clients and building new contact databases as part of her job as a marketing consultant. "For a lot of business development, it's really important to be persistent and consistent in communicating with people," she says. "With Act's focus on the contact, I can set up a good discipline." Sacco particularly likes the program's built-in word processor, which she uses each morning to dispatch faxes, letters, and e-mail.

Juggling several Act databases has its drawbacks: Sacco would like an integrated search function that would let her print a global to-do list covering all her databases. And when it comes to maintaining a personal schedule, Sacco still prefers her Day-Timer paper notebook.

Ecco Pro 3.0

PROS: Advanced linking tools and task management, Internet address book, strong workgroup features

CONS: Outline approach can be tough to learn and use

Powerful links, compelling group capabilities, and Internet features are among the tools that make Ecco Pro a $99 bullet train for power PIM users—and one of our two Best Buys. While the program's radically unorthodox style may derail some new users, a better interface makes this version easier to climb aboard than earlier Ecco releases.

Ecco Pro's address book now sports a familiar Rolodex-like look, and its calendar follows standard appointment-book style. Still, the program's real power resides in its unconventional Notepads—free-form databases with no fixed design. You can enter information any way you like, using an outlining metaphor and notebook-style tabs to sort and navigate through items. Once you master Notepads, you can track and cross-reference almost any kind of data. But getting accustomed to Notepads can be tough, especially if you're familiar with the typical task/contact approach of other PIMs.

Ecco Pro is an excellent document manager that lets you link external files such as word-processing documents with any appointment, contact, or Notepad entry, then launch the appropriate application to view and edit the file. Importing ASCII data from other applications into Ecco databases is a quick and easy routine, and you can either create your own printed forms or choose ready-made ones for common paper organizers (such as Day-Timers). A unique feature is the customizable Internet directory of more than 2000 World Wide Web sites. Double-click the site you want, and Ecco launches your Web browser and directs it to that site.

Only GoldMine approaches Ecco's range

MANAGING YOUR ECCO PRO PHONE BOOK IS EASIER now, thanks to the PIM's new card-file look.

of options for specifying which data you want to share with—or hide from—your coworkers. In contrast to GoldMine's tricky group setup, however, Ecco walks you through the process, so sharing all sorts of information is easy. Workgroup scheduling is also simple, and works over an unusually broad range of e-mail systems.

If you're just looking for an easy entry to electronic organizing, the learning curve of Ecco's Notepads may intimidate you. If you need a package you can customize to fit any job, though, the time it takes to master this infinitely flexible PIM is well worthwhile. *NetManage, 800/457-4243, 408/973-7171*
Reader service no. 713

GoldMine 2.5a

PROS: Powerful contact management and sales analysis features, strong workgroup options
CONS: Somewhat clunky interface, no tools for random information

If you live off your professional relationships, then GoldMine could be the just the PIM for you—especially if you're part of a close-knit sales force. If your needs are more basic, though, this $220 sales-oriented package is a less appropriate fit.

As a full-fledged contact manager, GoldMine uses your database of contacts as its centerpiece, associating each appointment, phone call, or other scheduled event with a person from the contact database. Its address book resembles a tabbed card file; each contact entry contains several cards covering personal and business information plus a log of past interactions with that person. These cards are highly customizable, but you can't store free-form information that's not associated with a contact.

Unlike the other products here, GoldMine is a workgroup product from the ground up; all information is public unless you tell it otherwise. That's not to suggest you can't keep confidential matters private: Its options for selectively hiding information—so you can make your calendar public but hide your phone log, for instance—are among the most powerful, although the complex setup process requires some network expertise.

Other GoldMine workgroup features meet the needs of managers. You can track how active other users' workdays are, for example, as well as delegate jobs to others, then keep track of whether they're completed. The program's e-mail module is handy for exchanging notes with other users, though you can't attach files to a message.

Where GoldMine stumbles somewhat is in usability. Importing data files may involve using programming commands, and printing options don't include formats for popular paper organizers. Also, the program is more keyboard intensive and character based than most. For instance, while most programs let you create appointments entirely with the mouse, GoldMine makes you type in certain information. Just the same, this package is a serious contender for telemarketers and other contact-oriented businesspeople, especially those who require stronger group features than Act provides. *Elan Software, 800/654-3526, 310/454-6800* **Reader service no. 714**

Janna Contact 95

PROS: Strong document management
CONS: Slow, poor group tools, inaccurate manual

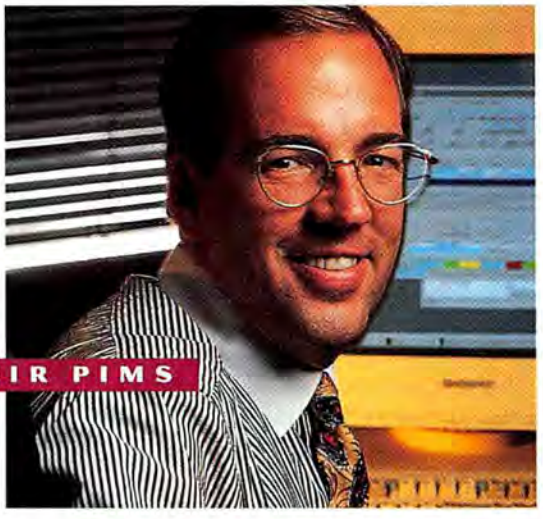
If you've upgraded to Windows 95, you're probably eager to get your hands on some applications that are designed especially for it. Unfortunately, Janna Contact 95, one of the first Windows 95 PIMs, would have benefited from another month in the shop.

First, the good news. Microsoft Office 95 users will feel at home in the $99 Janna Contact—it's Office compatible and looks like Office's programs. But unlike Office's Schedule+, Janna is a true contact manager that can associate tasks with contacts.

Janna lets you store documents created in other programs as objects, so you can view them along with the contact or task they relate to. Using OLE 2.0, it even lets you perform in-place editing using other OLE 2.0–compatible applications; the other pro-

REAL PEOPLE AND THEIR PIMS

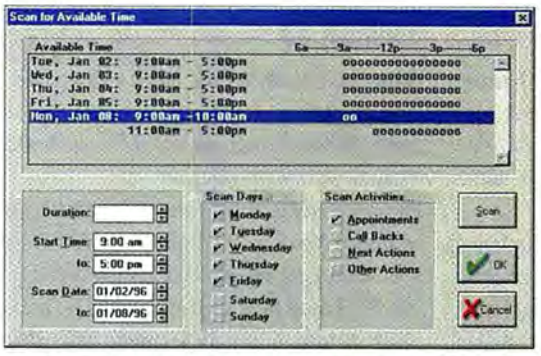
USER: Steve Bell, business consultant, Cupertino, California
SOFTWARE: Ecco Pro 3.0



ROBERT HOLMGREN

Despite the challenge of mastering Ecco 1.0, with its unorthodox approach to PIM design, Steve Bell stuck with the task. Bell, head of a data-communications consulting company, now uses Ecco Pro 3.0 to coordinate his eight-person staff. "Ecco's cross-reference capabilities are unsurpassed," he says, adding that it's the most frequently accessed program on the company's network. "People use it to see what's going on inside the company."

Bell was drawn to Ecco's outlining metaphor, which differs radically from typical PIM design. "I like the way the spreadsheet-style columns link the information so you can look at it from different perspectives," he says. In future versions, he'd like to see more reporting and printing tools. Better documentation wouldn't hurt, either. As much as he likes Ecco, he says that mastering it still requires time and effort.



GOLDMINE'S CAPABLE SCHEDULER uses ugly strings of zeros, rather than colored bars, to show blocked-out time.

gram's menus temporarily replace Janna's.

These features are appealing, but Janna's performance was extremely poor in our tests. Even on a Pentium PC with 16MB of RAM, it ground away at the hard disk to perform most tasks. Also, the printed and online help are bedeviled by inaccuracies and references to nonexistent features.

Janna includes integration with Schedule+ that's designed to let the latter program handle the details of group scheduling. But changes you make in your Janna schedule show up only in Schedule+, not the other way around. The upshot is that you have to maintain two separate schedules—your personal one in Janna, and a Schedule+ one for meetings initiated by your coworkers.

Despite its promise, this initial version of Janna Contact 95 doesn't deliver. At press time, Janna was working on improving the package; users of version 2.0—the most recent Windows 3.1 version, which offers better Schedule+ integration and brisker performance—should wait until Janna works out the kinks before upgrading. *Janna Systems, 800/268-6107* **Reader service no. 715**

Lotus Organizer 2.1

PROS: Familiar interface, drag-and-drop linking of information, easy to import existing address books

CONS: No advanced contact-sharing features, security options somewhat inflexible

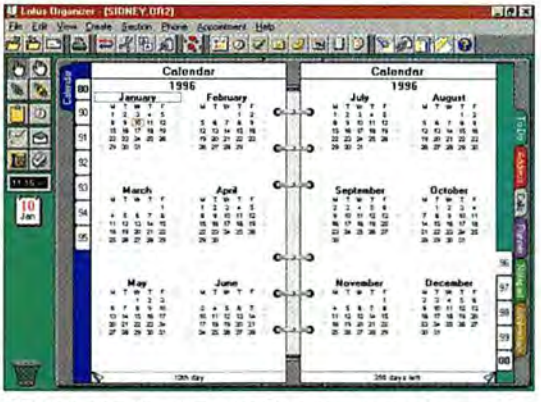
Lotus's $99 PIM—best known as a member of the SmartSuite office bundle—has a familiar tabbed-notebook interface that may be its greatest strength. Organizer's combination of an intuitive interface and respectable personal and workgroup organization tools makes it our choice as Best Buy for PIM neophytes.

Organizer looks like a spiral-bound paper organizer, so the transition is easy if you're just now moving to a PC-based planner. But with Organizer, you can quickly build connections between contacts, tasks, and other information simply by dragging items from one page to another. For example, you can schedule meetings by dragging names from the Address page to the Calendar tab.

You can jot down random information quickly in Organizer's Notepad section, and a slick conversion utility speeds importing address books from other PIMs. Printing options include numerous predesigned choices plus the ability to create new layouts.

Organizer does a good job of displaying other team members' schedules, finding free time during everyone's workday, and lining up resources such as meeting rooms. However, you can't give another user full rights to your schedule without also giving access to your tasks and contacts, and the program lacks heavy-duty features for sharing contact data with coworkers. Rather than offering a built-in e-mail facility, Organizer lets you jump to Lotus's cc:Mail or Notes by clicking an icon.

Organizer is far from the fanciest PIM on the market, but it's easy to learn and handles most routine tasks well. Offices that have standardized on SmartSuite needn't



THERE'S NOTHING INTIMIDATING about Lotus Organizer's spiral-bound notebook-style interface.

More Ways to Get Organized

If none of the eight PIMs in this review sound like a match for your work habits, don't worry. Here are some more choices, including specialized packages, as well as ones not available in time for a full review. Unless otherwise noted, all are Windows 3.1 programs.

If you're switching to a computer PIM from a Day-Timer paper organizer, you'll be totally comfortable with the look and feel of the $59.95 Day-Timer Organizer 2.0. New features in this version include the ability to do text searches of your contacts and drag and drop tasks across multiple users' schedules. Day-Timer Technologies, 800/225-5005. Reader service no. 720

InfoCentral is no longer available as a standalone product, but it still comes with Novell's PerfectOffice suite. (A Windows 95 version will be included in the Windows 95 upgrade to PerfectOffice, due in January.) Using an outline metaphor, it lets you assign your PIM data to specific categories. To find an item later, simply go to the category to which you assigned it. The beauty of InfoCentral is that it lets you view data in whatever way makes sense to you. Novell, 800/451-5151. Reader service no. 721

Micro Logic's $149 Info Select for Windows has always been the ideal PIM for disorganized types. It boasts blazing search speed, and its unstructured approach is like having an infinite supply of sticky notes in your PC. In version 3.0, Info Select adds standard PIM features such as a calendar, plus an outline view that lets you browse rapidly through databases. Micro Logic, 800/342-5930. Reader service no. 722

Long a popular PIM for Mac users, Now Up-to-Date has arrived in Windows 3.1 and Windows 95 versions. This $99 package lets you peek at your PIM data without even launching the program, using a toolbar that sits on your Windows desktop. Up-to-Date's contact and document-management tools are advanced for its price, and its group scheduling works with both the Windows and Mac versions. Now Software, 800/722-5963. Reader service no. 723

—Catherine Kenny, Harry McCracken, and Peter Scisco

SCHEDULE+'S PROJECT MANAGER–LIKE TO-DO LIST can track what percentage of a task is complete.

shell out more bucks for another PIM, unless their work requires more robust contact management. *Lotus Development, 800/343-5414, 617/577-8500* **Reader service no. 716**

Schedule+ for Windows 95

PROS: Simple time-management, Meeting Wizard for easy scheduling, project manager–style to-do list

CONS: No document-management tools

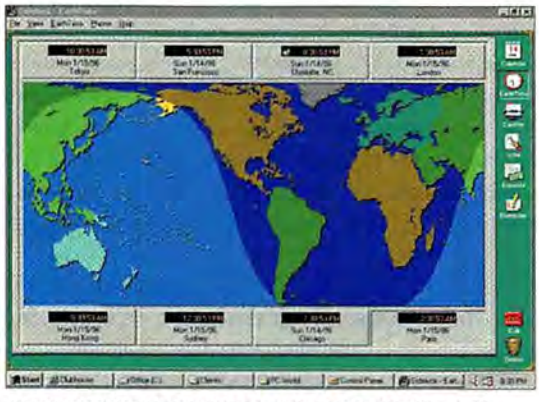
Formerly a group scheduler without any address book features, Microsoft's Schedule+ is now a true PIM, available both as a standalone product and as part of the Microsoft Office 95 bundle. This easy-to-use $99.95 time manger fits somewhere between Sidekick 95's simplicity and the contact-intensive world of Act and GoldMine.

Like Organizer, Schedule+ provides a tabbed interface that makes it simple to move from view to view. But it lacks some of the features that make Organizer a Best Buy entry-level PIM: It has no facility for storing random data (such as Organizer's Notepad), and you can't link external documents to your PIM items. Also, when importing contact data, you can verify only that the first record has been converted correctly, so some fields may go astray.

Schedule+'s more unusual features include support for the Timex Data Link wristwatch and a wizard that helps you plan goals using Stephen R. Covey's trendy *7 Habits of Highly Effective People* philosophy. The program's to-do list resembles a mini project manager; you can rank tasks by criteria such as priority and percentage complete.

A Meeting Wizard conveniently walks you through creating a meeting, including allowing time for everyone to get to the meeting from other appointments. As befits a Windows 95 PIM, the program also provides instant access to your Exchange e-mail in-box. However, the features for sharing contact data are limited and unintuitive.

Schedule+ gives Windows 95 users an efficient way to manage basic calendar and address book data, and those who are already using Microsoft Office for Windows 95 should try this PIM on for size before investigating other options. But those who also want to manage documents from within their PIM or share contact data with their coworkers will be better served by other products, such as Ecco and GoldMine. *Microsoft, 800/426-9400* **Reader service no. 717**



AVOID WAKING YOUR EUROPEAN CONTACTS AT 3 A.M. with Sidekick's multiple–time-zone support.

Sidekick 95

PROS: Simple to learn and use, built-in word processor, low price

CONS: Minimal workgroup support, can't attach files to entries, limited free phone support

Packed on two floppy disks, Sidekick 95 is a compact Windows 95 time manager that's a good choice for people taking their first step into PC-based time management. The price is right, too: under $50—about half what you'd pay for most time-management–oriented PIMs. (On the other hand, it's the only product here that doesn't offer free phone support after you're up and running; you shell out $2 per minute to get post-installation questions answered.)

At first glance, little distinguishes Sidekick 95 from its Windows 3.1 predecessor beyond the use of an Exchange in-box for routing e-mail and TAPI support for dialing

BRIAN SMALE

REAL PEOPLE AND THEIR PIMS

USER: Charles Suissman, newsletter publisher, New York

SOFTWARE: Organizer 2.1

Charles Suissman, a publisher (and undercover restaurant critic), has been using Lotus Organizer since he saw version 1.0 at a trade show in 1992. "I ran to the store to get it," he says. "I was a FiloFax user—the old-fashioned kind—and [Organizer] seemed like the ideal transition for me."

As the publisher of *Manhattan User's Guide*, an about-town newsletter for New Yorkers, Suissman uses Organizer to store facts about everything from restaurant openings to bicycle repair shops. He creates tabbed pages to hold the information, then works the information into Organizer's contact database after confirming its accuracy. Suissman likes Organizer's simplicity and easy customizing options, but he'd prefer a more robust notepad with word-processor tools like font control. One more thing: He misses the feel and smell of his FiloFax. "Organizer is less fun to hold."

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Circle 96 on reader service card

and receiving calls. But several new tools, such as a world clock and an expense report writer, are welcome additions. Also new is a handy built-in word processor, complete with control over fonts and color.

Sidekick lets you view and log appointments, phone calls, and other activities associated with a particular contact. And its respectable printing options provide plenty of templates, as well as tools for designing your own layouts. But don't expect all the features of costlier packages. For instance, it doesn't let you associate external files such as faxes with your calendar or address book. Also, Sidekick assumes the first record in a delimited ASCII file contains field names, which can make a mess of imported records.

Placing Sidekick data on a network server allows you to do some basic data sharing, but this PIM doesn't claim to offer real workgroup features; Starfish plans to release a network version in early 1996. *Starfish Software, 800/765-7839, 408/439-0942* **Reader service no. 718**

FEATURE COMPARISON PIMs for All Purposes

●=Yes ○=No

Standard features	Act 2.0 for Windows	Ascend 5.0	Ecco Pro 3.0	GoldMine 2.5a	Janna Contact 95	Organizer 2.1	Schedule+ for Windows 95	Sidekick 95
Street price [1]	$199	$109	$99	$220	$99	$99	$99.95	$49.95
Hard disk space required (MB)	6	8	6	6	8	8	6	4
OLE support (version)	○	1.0	1.0	○	2.0	○	2.0	○
Import formats [2]	ASCII, dBASE	ASCII	Act, ASCII, Organizer, Schedule+	Act, ASCII, dBASE, SDF	ASCII, dBASE, FoxPro	ASCII, dBASE	ASCII, Sharp Wizard [3]	ASCII, dBASE, DIF, Paradox, Cardfile
Expense tracking	○	○	●	○	●	●	○	●
Text searches	●	●	●	contacts only	●	●	●	●
Attach notes to entries	contacts only	●	●	●	●	contacts only	●	●
Attach files to entries	○	contacts only	●	contacts only	●	●	○	○
Assign categories to entries	contacts only	contacts and to-do's only	●	contacts only	●	●	to-do's only	to-do's only
Contact and schedule management								
Custom fields	●	○	●	●	●	●	●	●
Phone dialer/phone log	●/●	●/●	●/●	●/●	●/●	●/●	●/○	●/●
Built-in word processor	●	○	○	○	○	○	○	●
Link contacts to schedule	●	●	●	●	●	●	○	●
Calendar views: D = day, W = week M = month, Y = year, C = custom	D, W, M	D, W, 6-W, M	D, W, M, Y, C	D, W, M, Y, C	D, W, M, Y	D, W, 2-W, M, Y	D, W, M, Y, C	D, W, M, Y, C
Predefined holidays	○	●	●	●	●	○	●	●
Multiple priority levels for tasks	●	●	●	●	●	●	●	●
Recurring tasks	●	●	●	●	●	●	●	●
Workgroup features								
Automated group scheduling	○	●	●	●	○	●	●	○
Share contacts across network	●	○	●	●	●	●	●	●
E-mailed contacts, to-dos	●	●	●	●	●	●	○	○
Mark entries as confidential	●	●	●	●	●	●	●	○
E-mail front-end	●	●	●	●	●	○	○ [4]	○
E-mail compatibility	cc:Mail, MS Mail, Notes	cc:Mail, MS Mail	cc:Mail, Chameleon, MHS, MS Mail, Notes	cc:Mail, MS Mail	Exchange	cc:Mail, Notes	Exchange, MS Mail	Exchange
Service and support								
Free support (days)/toll-free	90/○ [5]	unlimited/○	unlimited/○	90/○	60/○ [6]	90	unlimited/○	[7]/○
Weekday support (hours)	9	12	10	9	12	12	12	11
Weekend online/fax support	○ [5]/●/●	○/●/●	○/●/●	○/●/●	○/●/○	○/●/●	○/●/●	○/●/●

BEST BUY

[1] Vendor estimate.

[2] Excluding filters for earlier versions of product.

[3] Filters for Access, Excel, Organizer, and others planned by end of 1995.

[4] Uses Windows 95's Exchange in-box.

[5] Toll-free and weekend support available at extra cost.

[6] First 10 minutes toll free.

[7] Free for installation and configuration only; $2 per minute thereafter.

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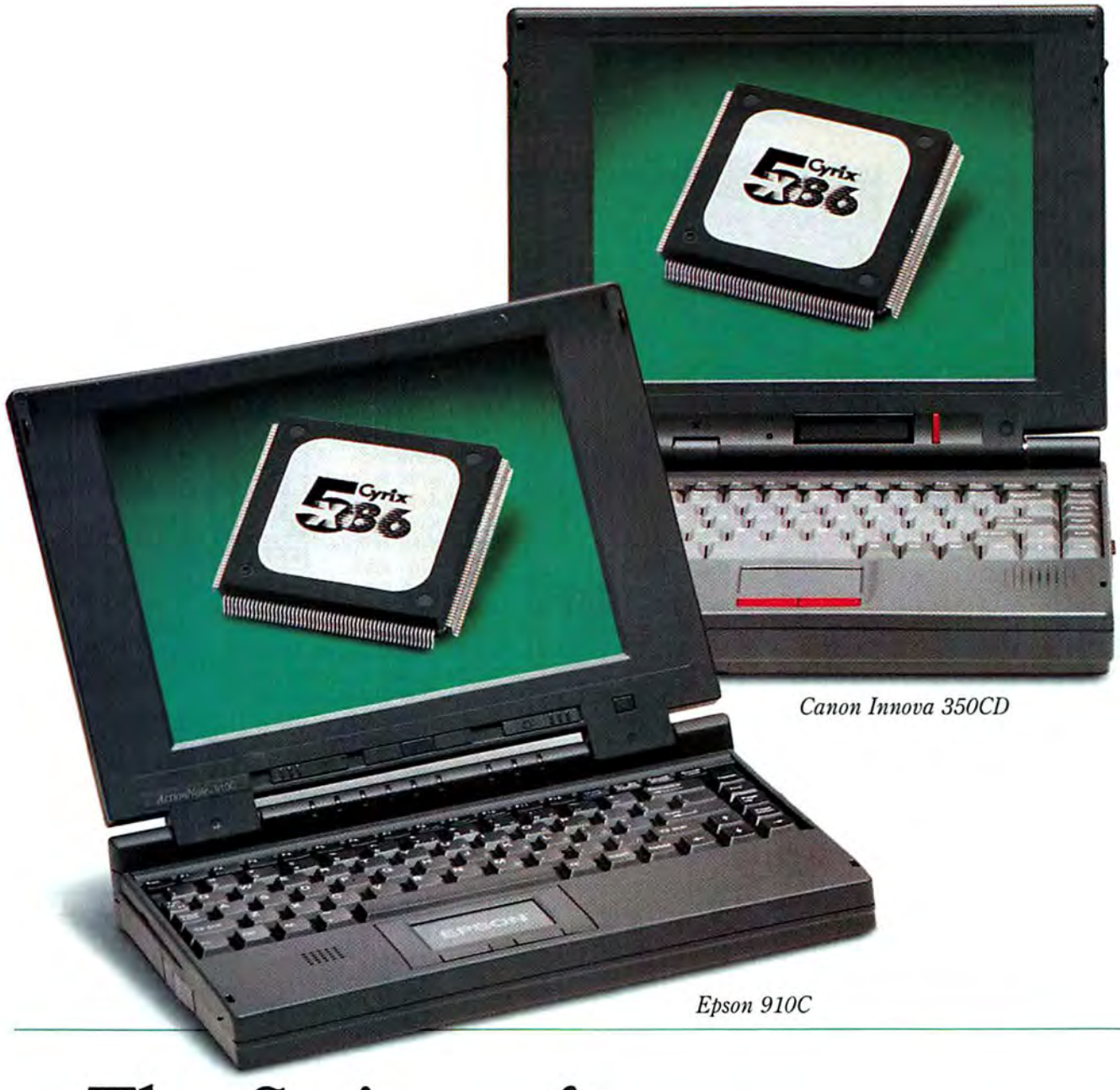

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Performance Benchmarks[1]

Winstone 95[2]

5x86/100	127
75 MHz Pentium® processor	117

Power Meter v 1.8 MIPS

5x86/100	40
75 MHz Pentium® processor	39

Norton System Information Version 8.0

5x86/100	264
75 MHz Pentium® processor	238

(1) All systems tested with 256K L2 cache.
(2) All systems tested with identical hard drive & graphics card.

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Cyrix® Advancing the Standards

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There's a fire sale going on as new processors drive down the cost of today's high-end systems.

Red-hot Pentium desktops are selling for up to $700 less than last month.

Low-cost PCs like CompuTrend's Cyrix-based Premio 5x86-100 (top) help force big price cuts on such power systems as the Austin PowerPlus 120 (left) and the Dell Dimension XPS P120c (right).

It's a Buyer's Market

BY BRAD GRIMES

Those price cuts we reported in November have really kicked in, and we've reason to believe there are more to come. Over half the systems on this month's Power Desktops Top 20 chart are selling for less than last month. Micron's Millennia line is about $100 less expensive, while the Austin PowerPlus 120, CompuAdd C133MHz, and Dell Dimension XPS P120c enjoy price drops of $400 to almost $700.

But the bottom hasn't fallen out yet. In October, almost a month earlier than scheduled, Intel announced price reductions across its Pentium line: Volume prices of P-133 and P-100 chips dropped 25 percent, while P-120 prices fell almost 40 percent. You can expect even more cuts at the beginning of 1996 when Intel's introduction of 150-MHz and 166-MHz Pentium processors prompts the company to slash prices even further. Besides new Intel chips, additional variety will bring a little spice to your buying decision as CPU makers Cyrix and AMD set their sights squarely on the Pentium market. This month marks the first appearance on our charts of systems based on Cyrix's 100-MHz 5x86 processor. Both the CompuTrend Premio 5x86-100 and the Micro Express MicroFlex-PCI/586 cost just $1799 and perform on a par with Pentium-75 systems. Moreover, the less

THE TOP 20
POWER PG. 214
BUDGET PG. 222
NOTEBOOKS PG. 230

ROBERT CARDIN

expensive chips that these PCs use allow the vendors to load them with 16MB of RAM and roomy 1080MB hard drives, which are larger than you get with P-75 systems in the same price range, such as the Dell Dimension P75t and the Gateway 2000 P5-75. Systems based on AMD's latest AmDX4-120 processor also deliver Pentium-level performance. This month we tested Diamond Technologies' $1600 DT-AS120, which proved to be faster than most Pentium-90s we've seen (and is a lot less expensive), but it just missed the Top 20 because of the company's below average service and reliability ranking (see Desktop Snapshots).

Hot Features: What to Look For

Desktops

EDO RAM—It's faster than regular memory, and more vendors are putting it in their systems. Dell, Gateway 2000, and Micron incorporated EDO memory months ago, while other vendors have just recently jumped on the bandwagon.

VRAM-based graphics cards—Once considered too expensive for the average PC user, faster VRAM cards are becoming more prevalent.

Video accelerators—Graphics cards like the Diamond Stealth64 Video have built-in features that help play back full-motion video clips at full screen without dropping too many frames.

Voice/data/fax-modems—Compaq and IBM have been using them in their home PCs for a while, but now several other vendors offer them in business models. With bundled software you can set up your PC to handle voice mail. Also look for these multifunction modems in notebooks like IBM's ThinkPad.

Notebooks

EDO RAM—What's good for desktops quickly becomes good for notebooks. Toshiba has already put EDO memory in several Satellite models.

External volume control—With more notebooks incorporating sound, it's nice to set the volume without going into a software program. Notebooks from IBM and Toshiba have these controls.

Infrared ports—When more peripherals like printers incorporate infrared functions, you'll be able to transmit data without wires. Texas Instruments' TravelMate line is among several that include infrared ports.

New and improved displays—Today's notebook screens are bigger (11.3 inches and up), brighter (up to 16.8 million colors), and better (supporting 800 by 600 resolution). The Austin Vista Notebook has an 11.3-inch screen; Toshiba's Satellite Pro 400CDT supports true color; and AST's newest Ascentias have Super VGA displays.

More for Less

Thanks to these recent developments, our Budget Top 20 looks like an econo-autobahn where systems priced under $2500 race at speeds up to 120 MHz. Of the seven systems making their first appearance on the budget chart this month, five are based on 100-MHz, Pentium-level CPUs, and one is based on a Pentium-120. The $2499 Gateway 2000 P5-120, which ranked as a power system last month, is now the fastest budget machine on the chart—so fast, in fact, that it outperforms seven units in the Power Top 20.

Another example of onetime power systems being priced into the budget category is the Dell Dimension XPS P90, which dominated the Best Buy ranks of the Power Top 20 for much of 1994 and 1995. At $2499, the XPS P90 is one of only two budget PCs to come with a 17-inch monitor.

Pentium Portables

Last summer we got our first taste of Pentium notebooks; now they occupy seven of the ten spots on our Power Notebook chart. The $4649 Toshiba Portégé 610CT and $5399 Dell Latitude XPi P90T, both Pentium-90 portables, remain our Best Buys, though their prices, and the prices of other Pentium notebooks, are still awfully high. But as new chips have done in the desktop market, a new mobile processor is set to drive down the cost of today's Pentium notebooks: Intel's P-120 should be featured in systems from Compaq, Dell, Gateway 2000, Hewlett-Packard, and Toshiba by the time you read this.

One thing is for sure: Not all Pentium notebooks are created equal. It takes a lot of advanced power management to keep them going and going, and many vendors just don't have what it takes. Of the eight new Pentium notebooks we tested this month, four lasted less than 3 hours on our battery tests and three lasted less than 2 hours. But the $4049 AST Ascentia 950N/75 and the $4649 Toshiba Satellite Pro 400CDT—both Pentium-75s—are two new notebooks that made the chart thanks in part to their long battery lives of almost 5 hours.

The Multipurpose PC

Even if you think you'll never replace your desktop PC with a notebook, several portables we'll be reviewing in coming months may change your mind. Zenith Data Systems is just one of several vendors that will begin selling Pentium-120 notebooks with 1GB hard disks and quad-speed CD-ROM drives. The ZDS Z-Note GT will also come with an 11.3-inch, Super VGA, active-matrix color screen, plus an optional internal MPEG-1 playback card. IBM's 90-MHz ThinkPad 760CD has the industry's first 12.1-inch color display, which comes close to that of a 14-inch monitor, as well as MPEG-2 and video capture hardware. But be prepared to fight off sticker shock: The 90-MHz version of the ZDS lists for $5898, while the ThinkPad 760CD goes for a whopping $7449.

Brad Grimes is an associate editor for PC World. *He can be reached on PC World Online (see page 12 for contact information).* PC World *staff member Angela Freeman and freelance writer Geoffrey Coffey contributed to this article. Testing by Ulrike Diehlman and Mike Salayko; research and support by Andrew Hawn and Julian Weatherby.*

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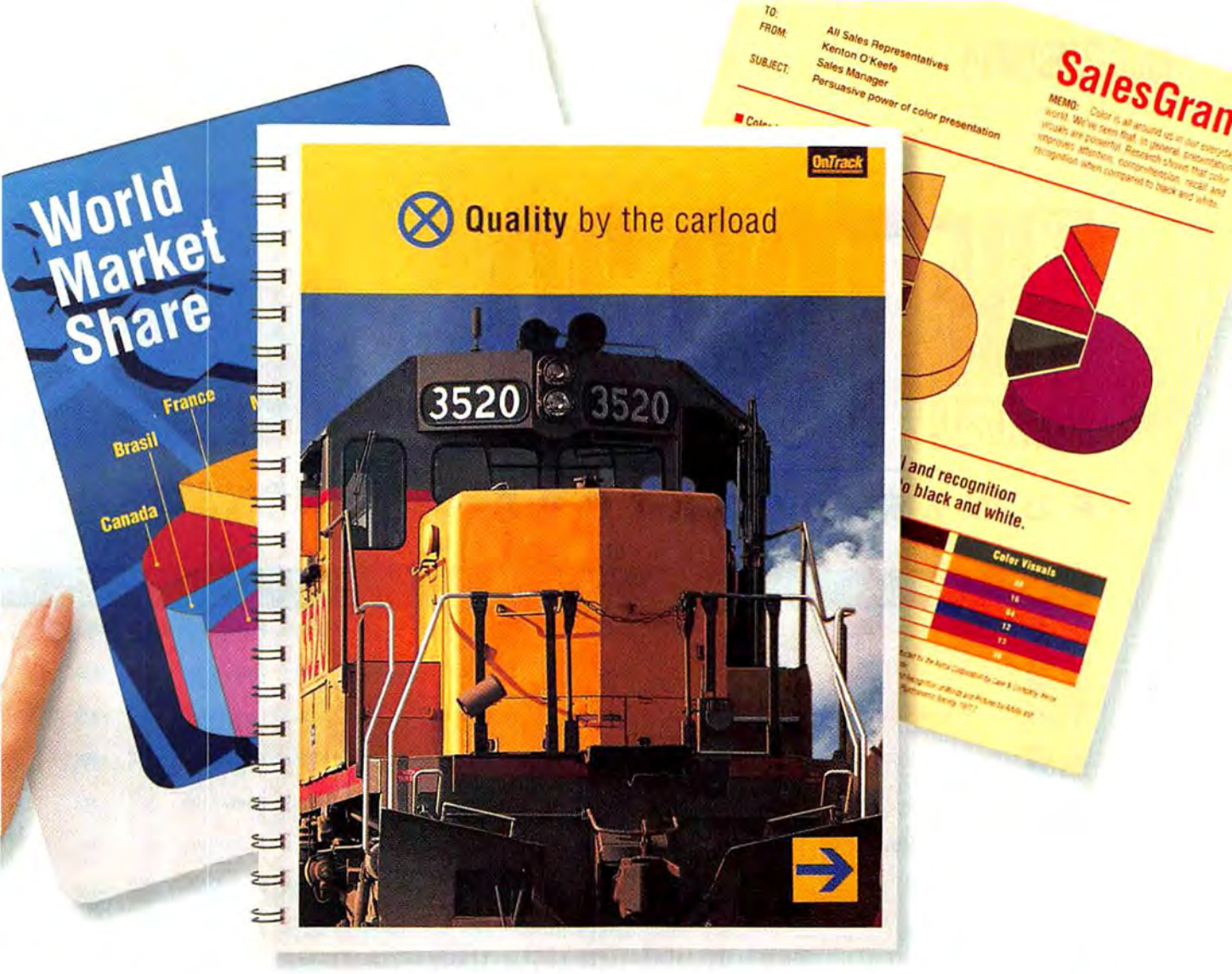

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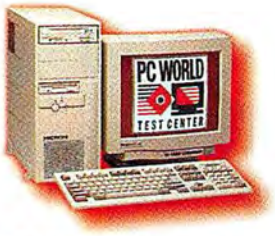
THE TOP 20

PC WORLD POWER DESKTOPS



1 Micron P133 Millennia
High-velocity multimedia.

	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	1	6	Aug 95	87	119	75/68	$3499	Pentium-133	16	1624
2 Dell Dimension XPS P133c	3	3	Nov 95	87	115	73/69	$3515	Pentium-133	16	1600
3 Micron P120 Millennia	2	8	Jun 95	86	111	75/68	$2899	Pentium-120	16	1278
4 Dell Dimension XPS P120c	5	5	Sep 95	85	111	73/69	$3280	Pentium-120	16	1080
5 Micron P100 Millennia	4	6	Aug 95	85	107	75/68	$2799	Pentium-100	16	1278
6 Dell Dimension XPS P100c	6	6	Aug 95	84	100	73/69	$2648	Pentium-100	16	1083
7 CompuAdd C133MHz	8	2	Oct 95	84	119	71/67 [2]	$3584	Pentium-133	16	1624
8 Gateway 2000 P5-120XL	7	8	Jun 95	83	113	66/64	$3299	Pentium-120	16	1624
9 Gateway 2000 P5-133XL	9	6	Aug 95	82	120	66/64	$3999	Pentium-133	16	1624
10 Austin PowerPlus 120	18	2	Sep 95	82	108	64/69 [2]	$3313	Pentium-120	16	1278
11 DTK Quin-54M/P133	10	2	Dec 95	81	111	73/68	$3390	Pentium-133	16	1080
12 Austin PowerPlus 133	12	3	Nov 95	81	112	64/69 [2]	$4199	Pentium-133	16	1625
13 Tangent MediaStar 5133	14	3	Nov 95	81	126	[2]	$3295	Pentium-133	16	1080
14 Quantex QP5/133 SM-2	—	1	current	80	117	60/63	$3399	Pentium-133	16	1624
15 Gateway 2000 P5-100XL	13	8	Jun 95	80	111	66/64	$3199	Pentium-100	16	1083
16 Austin PowerPlus 100	32	2	Jul 95	80	101	64/69 [2]	$3024	Pentium-100	16	1278
17 Everex Step Pro P133	16	3	Nov 95	80	117	62/66 [2]	$3695	Pentium-133	16	1278
18 AST Bravo MS P/133	17	2	Dec 95	80	99	72/68	$2980	Pentium-133	16	1624
19 Micron P90 Power Station	19	12	Feb 95	79	86	75/68	$2699	Pentium-90	16	1080
20 Digital Celebris XL 590	21	8	May 95	79	86	75/69	$4149	Pentium-90	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 Dell Dimension XPS P133C
Big hard drive, monitor.

3 Micron P120 Millennia
Speedy P-133 alternative.

4 Dell Dimension XPS P120c
Dell power for less.

5 Micron P100 Millennia
Fast Pentium-100.

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	643	Another $100 off keeps fast P-133 with state-of-the-art CD-ROM drive no. 1.
4X	ISA, PCI	17"/.28	800/613-3355	3299	644	Fast, well-built minitower comes with new, bigger hard drive.
4X	ISA, PCI	15"/.28	800/223-6571	3242	645	$100 price drop makes this P-120 a great alternative to pricier P-133s.
4X	ISA, PCI	17"/.28	800/613-3355	3281	646	With 17-inch monitor (and $419 off), it's a better graphics PC than Micron's offerings.
4X	ISA, PCI	15"/.28	800/223-6571	3267	647	Good price, great 100-MHz performance, solid configuration—a fine value.
4X	ISA, PCI	17"/.28	800/613-3355	3265	648	One of the best P-100s we've seen is now $100 cheaper. Sound is a $99 option.
4X	ISA, PCI	15"/.28	800/627-1961	3307	650	Huge $568 price drop from last month on fast, roomy minitower.
4X	ISA, PCI	17"/.25	800/846-2000	3244	649	Value-priced P-120 has hot performance, great configuration, and CD-ROM changer.
4X	ISA, PCI	17"/.25	800/846-2000	3269	651	Superfast Pentium-133 with CD-ROM changer is feature-laden.
4X	ISA, PCI	17"/.26	800/752-1577	3311	652	$650 price cut puts P-120 with fast modem, bigger hard drive on par with no. 7 Gateway.
4X	ISA, PCI	17"/.26	800/289-2385	3306	653	Combines high-quality components with much-improved reliability.
6X	ISA, PCI	17"/.28	800/752-1577	3303	654	Most expensive P-133 on chart, but loaded with 6X CD-ROM drive and fast modem.
4X	ISA, PCI	17"/.28	800/342-9388	3300	655	One of least expensive Pentium-133s is also fastest PC we've ever seen.
4X	ISA, PCI	17"/.26	800/896-4898	3322	656	New EDO RAM and pipeline-burst cache make for a fast, low-cost P-133.
4X	ISA, PCI	17"/.25	800/846-2000	3245	657	Fastest Pentium-100 system we've tested has multimedia and fax-modem.
4X	ISA, PCI	17"/.26	800/752-1577	3254	658	$600 price drop bodes well for speedy P-100 with 28.8-kbps fax-modem.
4X	ISA, PCI	17"/.28	800/821-0806	3302	659	Decent price for quick, spacious, sturdy multimedia tower.
—	ISA, PCI	15"/.28	800/876-4278	3310	660	Only Top 20 power desktop with no CD-ROM drive, but has fine reliability and service.
4X	ISA, PCI	15"/.28	800/223-6571	3184	661	Solid P-90 with fine multimedia, but higher-powered PCs are as inexpensive.
4X	ISA, PCI	17"/.26	800/722-9332	3223	662	$100 price drop helps this high-powered PC, but it's awfully expensive for a P-90.

Report, $9.95; available December 22). 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. 905.

Top 20 Power Desktops

WHILE THE TOP FIVE REMAIN THE SAME THIS month, a couple of systems have flip-flopped. With a roomier hard drive, the Dell Dimension XPS P133c moves up to number two, ahead of the Micron P120 Millennia, while the Dimension XPS P120c takes over the number four spot. Prices for Micron's Best Buy systems have been cut by $100, further establishing them as top-notch values. You'll notice, however, that the Micron machines have 15-inch monitors, which the company still sells with several high-end systems. To get an idea of how Micron's prices compare to other PCs ranked here, add $300 for a 17-inch monitor.

The only brand-new PC on the chart is Quantex's souped-up QP5/133 SM-2, which uses EDO RAM and pipeline-burst cache to increase performance 15 percent over the previously reviewed QP5/133 SM-1. At just $3399, the QP5/133 SM-2 is also a terrific buy.

1 Micron P133 Millennia

REVIEWED: August 1995

PROS: Fast system with huge hard drive, 6X CD-ROM drive

CONS: One-year warranty

Another $100 drop in price, to $3499, helps the P133 Millennia hold on to the top spot. Of course, lighting-fast performance, 16MB of EDO RAM, and a huge 1624MB hard drive don't hurt either. The company also throws in all the multimedia trimmings and a software bundle that includes Microsoft Office Professional. But Micron is still shipping mainly 15-inch monitors, rather than the 17-inch models most vendors on the Power Top 20 are selling. A 17-inch monitor from Micron costs $300 extra.

2 Dell Dimension XPS P133c

REVIEWED: November 1995

PROS: Fast performance, first-class components, excellent reliability and service records

CONS: On/off button looks too much like a floppy eject button

This Dell minitower now ships with a 1600MB hard drive, moving it up one spot to number two on the chart. The Dimension's other quality components include an NEC quad-speed CD-ROM drive, Creative Labs Sound Blaster AWE32 wavetable sound card, Number Nine 9FX Motion771 full-motion video accelerator, and an internal U.S. Robotics 28.8-kbps V.34 fax-modem. Dell also offers one of the best service and support packages in the business—reflected in its high reliability and service scores.

3 Micron P120 Millennia

REVIEWED: June 1995

PROS: Very fast P-120 performance, excellent expandability, full multimedia

CONS: One-year warranty

Micron lopped yet another $100 off the price of the P120 Millennia, bringing the total to $2899. It ships with 16MB of EDO RAM, a roomy 1278MB hard drive, and a 64-bit Diamond Stealth64 PCI graphics card with 2MB of VRAM. Micron's reliability and service ratings have improved recently, but the company still offers only a one-year standard warranty.

4 Dell Dimension XPS P120c

REVIEWED: September 1995

PROS: Great performance, 28.8-kbps fax-modem, full multimedia

CONS: On/off button can be mistaken for floppy eject button

Dell has dropped the price on its powerful Pentium-120 minitower by more than 10 percent. The $3280 Dimension XPS P120c has 16MB of EDO RAM, a 1080MB hard drive, a 17-inch monitor, a 28.8-kbps fax-modem, and a 2MB VRAM Number Nine 9FX Motion771 graphics board with full-motion video acceleration.

5 Micron P100 Millennia

REVIEWED: August 1995

PROS: Fast, big hard drive, full multimedia

CONS: One-year warranty

Like the Millennias before it, this Pentium-100 minitower enjoys a $100 price drop this month. At $2799, it features 16MB of EDO RAM, a 1278MB hard drive, and a Diamond Stealth64 Video card with 2MB of VRAM. Our advice: Put the cost savings towards a 17-inch monitor.

6 Dell Dimension XPS P100c

REVIEWED: August 1995

PROS: Good performance, new $2648 price, great service

CONS: On/off button can be mistaken for the floppy eject button, no sound

7 CompuAdd C133MHz

REVIEWED: October 1995

PROS: New lower $3584 price, speedy performance

CONS: No free SIMM sockets, one-year warranty

8 Gateway 2000 P5-120XL

REVIEWED: June 1995

PROS: Price drop to $3299, very fast, big 1624MB hard drive, full multimedia

CONS: No guaranteed turnaround time for factory repairs

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9 Gateway 2000 P5-133XL

REVIEWED: August 1995

PROS: Lightning fast, huge 1624MB hard drive, 17-inch monitor, multimedia package

CONS: No set turnaround time for repairs

10 Austin PowerPlus 120

REVIEWED: September 1995

PROS: 17 percent price drop, 28.8-kbps fax-modem, now comes with 1278MB hard drive

CONS: None

11 DTK Quin-54M/P133

REVIEWED: December 1995

PROS: Reasonable $3390 price for a Pentium-133, full multimedia configuration

CONS: Documentation could be better, no weekend technical support available

12 Austin PowerPlus 133

REVIEWED: November 1995

PROS: Big hard drive, 6X CD-ROM drive, good tech support policies

CONS: Pricey at $4199, no free SIMM sockets for easy memory upgrades

13 Tangent MediaStar 5133

REVIEWED: November 1995

PROS: Unmatched performance, good $3295 price for a P-133, fine multimedia components

CONS: No bundled software.

14 Quantex QP5/133 SM-2

NEW THIS MONTH

PROS: EDO RAM for great speed, huge hard drive, good software

CONS: One-year warranty, limited add-in card options

Quantex has joined the ranks of computer vendors souping up their systems with the latest memory technologies in order to boost speed. The QP5/133 SM-2, which replaces the SM-1 we reviewed two months ago, turned in a performance rating 15 percent higher than its predecessor and has a $3399 price tag that beats much of the competition in its CPU class.

Quantex SM-2

The new SM-2 is loaded with 16MB of EDO RAM, 256K of pipeline-burst secondary cache, and a giant 1624MB hard drive. Fully equipped for multimedia, the SM-2 includes a Toshiba quad-speed CD-ROM drive, an Ensoniq 16-bit sound card, and a pair of 14-watt speakers with subwoofer. For great graphics, the SM-2 has an ATI Technologies video board with 2MB of fast, dual-ported VRAM, and a programmable 17-inch MAG Innovision DX17F monitor (16-inch viewable area) with a fine, .26mm dot pitch. There's even a 28.8-kbps internal fax-modem for speeding through cyberspace. The software bundle is the icing on the cake: It includes Novell's PerfectOffice application suite, Intuit's Quicken, and a variety of multimedia titles.

We found the midsize tower's interior somewhat cluttered. Of the three free PCI slots, one was blocked by cables and another shared an opening in back of the PC with an ISA slot that already housed the sound card. To access the latter PCI slot, you'll have to move the sound card to a dedicated ISA slot. Fortunately, it's far easier to make use of the seven open drive bays and two free SIMM sockets. The user manuals are well-written, and there's even a quick-start folder with information about system setup, warranties, and tech support policies.

Quantex's one-year warranty is subpar, though on-site service is free during that year. If your PC can't be fixed on-site, Quantex promises to repair and return the system by the next business day. Toll-free tech support averages 11 hours: 12 hours Monday through Thursday, 9 hours on Fridays, and 6 hours on Saturdays. Readers responding to our fax-back survey give Quantex average marks for reliability and service, but there's nothing average about the deal you can get on the SM-2.

15 Gateway 2000 P5-100XL

REVIEWED: June 1995

PROS: Fastest Pentium-100 system we've tested, quad-speed CD-ROM drive, fax-modem

CONS: No free SIMM sockets for easy memory upgrades, no set turnaround time for repairs

16 Austin PowerPlus 100

REVIEWED: July 1995

PROS: Good performance, quality monitor, 28.8-kbps fax-modem, multimedia

CONS: None

17 Everex Step Pro P133

REVIEWED: November 1995

PROS: Fine performance, roomy hard drive, full multimedia, sturdy construction

CONS: No free SIMM sockets for easy memory upgrades, no weekend support available

18 AST Bravo MS P/133

REVIEWED: December 1995

PROS: Great price at $2980, big 1624MB hard drive

CONS: Slow for a Pentium-133 system, only desktop in Power Top 20 without a CD-ROM drive

19 Micron P90 Power Station

REVIEWED: February 1995

PROS: Fast Pentium-90 performance, good reliability and service

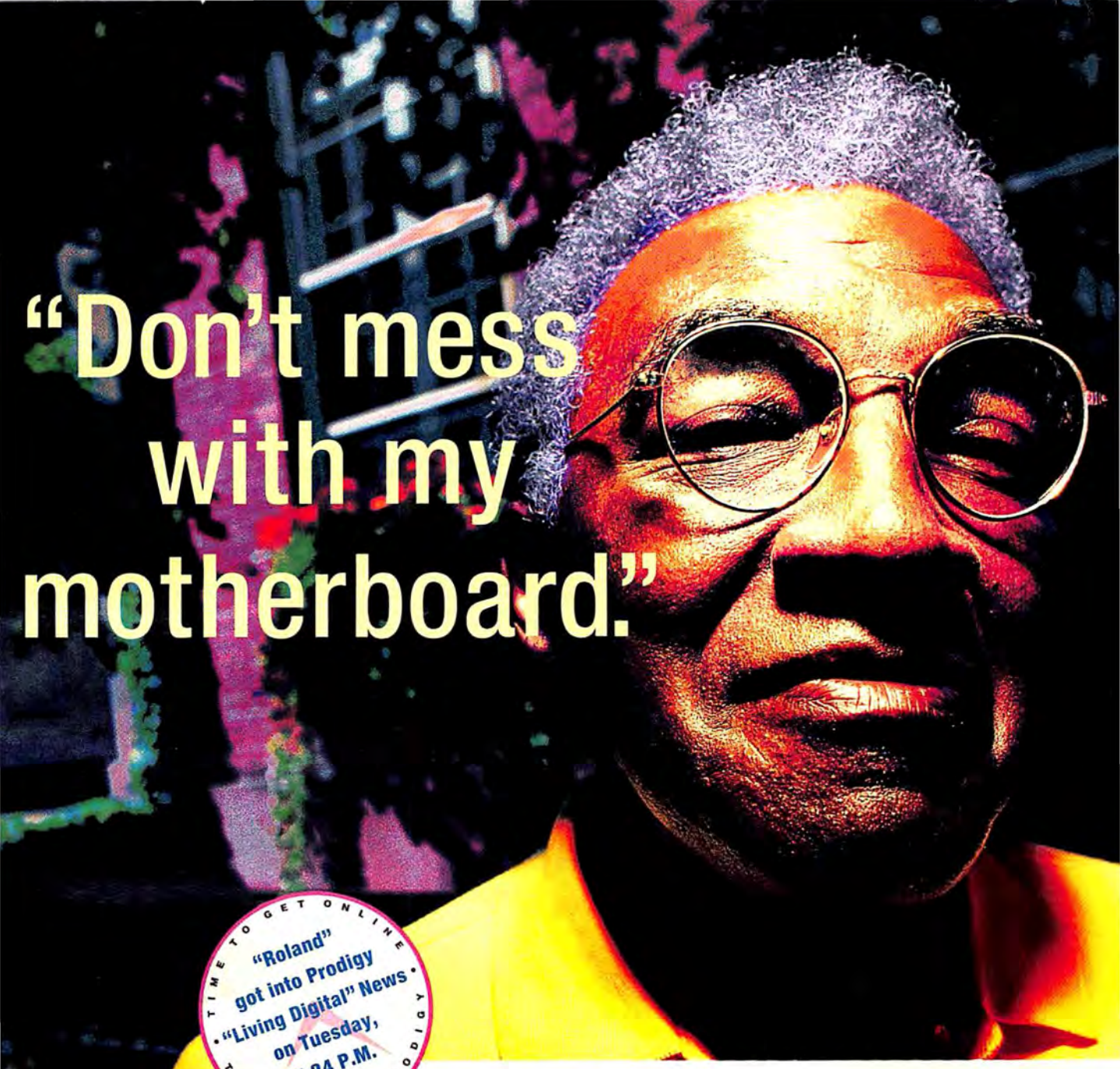
CONS: One-year warranty is minimal these days

20 Digital Celebris XL 590

REVIEWED: May 1995

PROS: Free socket for a second CPU, quad-speed CD-ROM drive, high reliability rating

CONS: At $4149 it's extremely expensive for a Pentium-90



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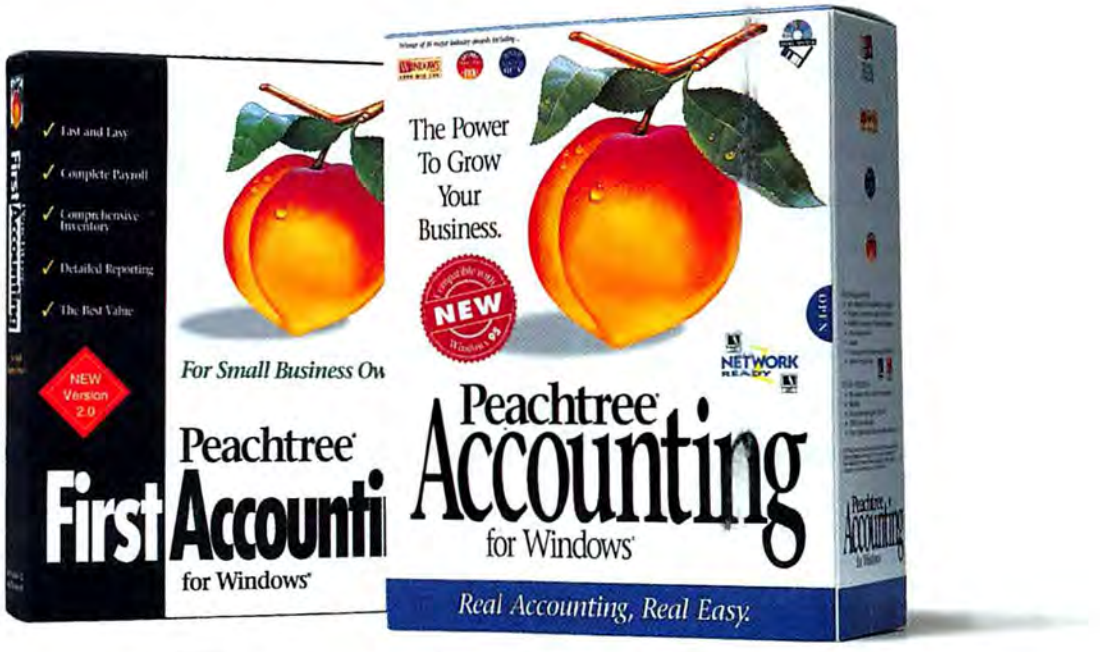

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THE PC WORLD TOP 20

BUDGET DESKTOPS

1 Dell Dimension P75t
Top PC priced for everyone.

	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	2	Dec 95	85	75	73/69	$1679	Pentium-75	8	540
2 Micron 4100 Magnum	2	6	Aug 95	84	70	75/68	$1799	DX4-100	8	1278
3 DTK Quin-35M/P75	3	6	Aug 95	82	70	73/68	$1850	Pentium-75	8	1083
4 Micron P90 Home MPC	4	6	Aug 95	82	74	75/68	$2099	Pentium-90	8	850
5 Dell Dimension XPS P90	–	1	Sep 95	81	93	73/69	$2499	Pentium-90	8	1080
6 CompuTrend Premio 5x86-100	–	1	current	80	77	[2]	$1799	Cyrix 5x86-100	16	1080
7 Gateway 2000 P5-75	8	2	Dec 95	80	67	66/64	$1739	Pentium-75	8	850
8 Gateway 2000 P5-120	–	1	Dec 95	80	110	66/64	$2499	Pentium-120	16	1083
9 Micro Express MicroFlex-PCI/586	–	1	current	80	70	63/61 [2]	$1799	Cyrix 5x86-100	16	1080
10 Vektron Multimedia P-100	–	1	current	80	88	[2]	$1995	Pentium-100	8	852
11 Tempest Pentium Giga Media P5-100	–	1	current	80	86	[2]	$1988	Pentium-100	16	1270
12 Vektron PCI P-75	9	7	Jul 95	79	74	[2]	$1550	Pentium-75	8	852
13 Netis 5100 Media	–	1	current	79	103	[2]	$2390	Pentium-100	16	1624
14 Gateway 2000 P5-100	5	2	Nov 95	79	104	66/64	$2479	Pentium-100	16	1084
15 Polywell Poly 4120P8	7	2	Dec 95	79	73	[2]	$1895	AmDX4-120	8	1080
16 Compaq ProLinea 575	20	2	Sep 95	79	69	77/72	$1959	Pentium-75	8	630
17 Quantex QP5/75 M-1	16	5	Sep 95	78	65	60/63	$1699	Pentium-75	8	850
18 Quantex QP5/90 M-3	19	2	Mar 95	78	79	60/63	$2128	Pentium-90	16	1083
19 Austin PowerPlus 75	6	4	May 95	78	69	64/69 [2]	$1999	Pentium-75	8	850
20 Digital Venturis 575	21	1	Sep 95	78	82	75/67	$2169	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
Good speed, fully loaded.

3 DTK Quin-35M/P75
Tower power on a budget.

4 Micron P90 Home MPC
For the office or family room.

5 Dell Dimension XPS P90
More power, less money.

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	663	Despite small hard drive and no sound, P-75 minitower is great PC from top company.
4X	ISA, PCI	15"/.28	800/223-6571	3273	664	Last DX4-100 on chart makes it to no. 2 thanks to full multimedia and huge hard drive.
4X	ISA, PCI	15"/.28	800/289-2385	3274	665	Good performance, attractive price, fine reliability on tower system.
4X	ISA, PCI	15"/.28	800/223-6571	3275	666	Full multimedia, fax-modem, and software bundle make P-90 suited for home.
4X	ISA, PCI	17"/.28	800/613-3355	3282	667	Once a dominant power system, now priced for the budget-conscious.
4X	ISA, PCI	15"/.28	800/677-6477	3323	668	Speedy, low-cost processor, plus features needed for power computing.
4X	ISA, PCI	15"/.25	800/846-2000	3317	669	Well-built system is a good value, but lacks secondary cache and sound.
4X	ISA, PCI	15"/.28	800/846-2000	3309	670	Most powerful PC we've tested in this price range. Sound costs $99 extra.
4X	ISA, PCI	15"/.28	800/989-9900	3324	671	P-75 performance and a good Win 95 configuration at an ultralow price.
4X	ISA, PCI	15"/.28	800/725-0026	3325	672	Great deal for multimedia machine with 4MB of fast video memory.
4X	ISA, PCI	15"/.28	800/818-5163	3326	673	Incredible price considering all the memory, storage, and multimedia extras.
—	ISA, PCI	15"/.28	800/725-0026	3257	674	Superlow price for fast desktop reflects lack of CD-ROM drive and sound.
4X	ISA, PCI	15"/.28	800/577-7526	3327	675	Perhaps the greatest bang for your buck, but unproven service and reliability.
4X	ISA, PCI	15"/.25	800/846-2000	3314	676	Look for a price cut soon to differentiate this solid P-100 from its P-120 sibling.
4X	ISA, PCI	15"/.28	800/999-1278	3316	677	Strong, low-cost alternative to Intel-based systems performs like a Pentium-75.
—	ISA, PCI	15"/.28	800/345-1518	3318	678	Solid system with great support from PC leader, but small hard disk and no CD-ROM drive.
4X	ISA, PCI	15"/.28	800/896-4898	3284	679	Multimedia PC is good value, especially after $100 price cut.
4X	ISA, PCI	17"/.26	800/896-4898	3200	680	14.4-kbps fax-modem and nice 17-inch monitor.
4X	ISA, PCI	15"/.28	800/752-1577	3315	681	Well-configured Pentium-75 with multimedia and fax-modem.
4X	ISA, PCI	14"/.28	800/722-9332	3328	682	A $230 price drop makes a good bargain, despite small monitor.

Report, $9.95; available December 22). 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. 906.

Top 20 Budget Desktops

THE MOST SIGNIFICANT ADDITION IS THE Gateway 2000 P5-120, which becomes the first Pentium-120 we've tested to cost under $2500. Last month the P5-120 was a power system, but a $200 price drop lands it on the budget chart.

Five systems tested this month, all equipped with 100-MHz processors, make their way onto the Budget Top 20. Three newcomers—the Netis 5100 Media, the Tempest Pentium Giga Media P5-100, and the Vektron Multimedia P-100—use 100-MHz Pentiums. The other two—the CompuTrend Premio 5x86-100 and the MicroExpress MicroFlex-PCI/586—run on the Cyrix 5x86-100 chip, which performs like a Pentium-75 but costs less.

1 Dell Dimension P75t

REVIEWED: December 1995

PROS: Low price, good performance, three-year parts warranty

CONS: On/off button looks like a floppy eject button, no sound

For $1679, you can get a Pentium-75 minitower from one of the top vendors on the power chart. The Dimension P75t comes with 8MB of RAM, a smallish 540MB hard drive, a 15-inch monitor, and a quad-speed CD-ROM drive. Add $99 if you want sound capabilities. As with all Dell systems, this budget PC is backed by excellent service and support.

2 Micron 4100 Magnum

REVIEWED: August 1995

PROS: Fast for a DX4-100 desktop, big hard drive, full multimedia

CONS: One-year warranty

The 4100 Magnum's new price of $1799 (down $100) is actually more than Dell's top-ranked Pentium-75, but the Magnum comes with a roomy 1278MB hard drive and a full set of multimedia components. Moreover, Micron's reliability and service ratings are on the rise, even if its one-year warranty is short.

3 DTK Quin-35M/P75

REVIEWED: August 1995

PROS: Good price, solid performance, roomy hard drive

CONS: Cluttered motherboard, no money-back guarantee

The $1850 DTK Quin-35M/P75 comes with 8MB of RAM, a 1083MB hard drive, and a quad-speed CD-ROM drive. Readers who responded to our survey rate DTK's reliability on par with some of the top vendors. Unfortunately, if you don't like the system or it just won't work right, DTK won't refund your money—it will only send a replacement.

4 Micron P90 Home MPC

REVIEWED: August 1995

PROS: Great price for a fast budget PC with lots of extras

CONS: Sluggish performance for a P-90, one-year warranty

Micron's Pentium-90 home PC now sells for just $2099, down from $2249 last month. That figure includes 8MB of RAM, an 850MB hard drive, a quad-speed CD-ROM drive, and a 15-inch monitor. The extras include a 2MB DRAM Diamond Stealth64 graphics controller and a 14.4-kbps U.S. Robotics fax-modem.

5 Dell Dimension XPS P90

REVIEWED: September 1995

PROS: Scorching performance, 17-inch monitor, excellent service

CONS: On/off button looks like the floppy eject

Once a Best Buy power desktop, the $2499 Dell Dimension XPS P90 now qualifies as a fast budget machine. With 8MB of RAM, a 1080MB hard drive, and a quad-speed CD-ROM drive, it is a great buy—even if it's not the most powerful PC on the market. It's also one of only two budget systems with a 17-inch monitor.

6 CompuTrend Premio 5x86-100

NEW THIS MONTH

PROS: Decent speed, great price, lots of features

CONS: Poor monitor with low refresh rates, haphazard design

Of the three desktop systems we tested this month that are based on Cyrix's alternative to the Pentium, the CompuTrend Premio 5x86-100 was the fastest—on par with the top Pentium-75 desktops we've tested. The best news is that the Premio costs just $1799 in a power desktop configuration: 16MB of RAM, 256K of secondary cache, 1080MB hard drive, and full multimedia including a quad-speed CD-ROM drive. Similarly priced P-75 systems on the Budget Top 20 usually have less memory, smaller hard drives, and no sound capabilities.

CompuTrend

On some fronts, though, you get what you pay for. The graphics system in our test machine reflects a shortcoming we've found in too many budget desktops: The video board far outclasses the monitor. The Premio came with a Number Nine 9FX Motion531 with 2MB of DRAM, which can handle high resolutions and refresh rates as well as accelerate full-motion video clips. However, the Premio 15-inch monitor (the actual viewable area is under 14 inches) supports only a pitiful 56-Hz refresh rate at 800-by-600 resolution.

The Premio's compact desktop design also has problems. Our test unit had just one free SIMM socket, and we found that the

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motherboard bent alarmingly under stress, which makes for a tense experience when installing boards in the PC's free slots (three ISA and two PCI). CompuTrend's service and support policies are so-so. You get a two-year parts and labor warranty. On-site service is available, but at a price of $169 for three years. And while toll-free tech support is available 10 hours a day, Monday through Friday, there are no weekend hours. In the end, Premio exploits the Cyrix processor by delivering decent performance and features at a low price. Although the assembly seems hasty and the support is marginal, this CompuTrend is a strong value.

7 Gateway 2000 P5-75

REVIEWED: December 1995

PROS: Low price, quality monitor, good hard drive

CONS: No sound card, speakers, or secondary cache

8 Gateway 2000 P5-120

REVIEWED: December 1995

PROS: Spectacular $2499 price tag, 16MB of RAM, big hard drive

CONS: No sound card or speakers

9 Micro Express MicroFlex-PCI/586

NEW THIS MONTH

PROS: Great price, big hard drive, decent speed

CONS: No sound or speakers

Micro Express is known for selling PCs at affordable prices. It's no wonder, then, that the company seized on Cyrix's new low-cost Pentium alternative, the 5x86, in an effort to keep the deals coming. The 5x86 runs at 100 MHz, but it's not as fast as a Pentium-100. The MicroFlex PCI/586 performs more like a Pentium-75, which is about what we've seen from Cyrix 5x86-100 systems in general. But thanks to the less expensive processor, Micro Express can arm its new MicroFlex with the power to run Windows 95—16MB of RAM, 256K of secondary cache, and a 1080MB hard drive—and charge just $1799.

Micro Express

The MicroFlex PCI/586 also comes with a 15-inch monitor (14.1-inch viewable area), a Toshiba quad-speed CD-ROM drive, and an STB Velocity 64V video card with 2MB of fast VRAM. Our system didn't have a sound card and speakers, however, so make sure Micro Express includes them if you choose to buy; the extra cost is minimal, and it's a necessary expense if you want to use the CD-ROM drive for multimedia. Overall, this minitower is well built, with a strong, uncluttered motherboard. You can install either two PCI and four ISA cards or three PCI and three ISA cards depending on how you use the system's shared slot. There are also four extra drive bays and two free SIMM sockets. Micro Express's support policies are above average: two-year warranty, free on-site service from GE, 30-day money back guarantee, and round-the-clock phone support. But note: If you call after business hours or at certain times on the weekend, you'll have to leave a message, and someone should get back to you that day. While we don't have enough survey responses from Micro Express customers to gauge service and reliability, early returns indicate the company is doing an average job. If it can meet users' needs as quickly as it adopts the latest processors, Micro Express will continue to be news on the budget chart.

10 Vektron Multimedia P-100

NEW THIS MONTH

PROS: Inexpensive, 4MB of video RAM, 14.4-kbps fax/data/voice-modem

CONS: One-year warranty

The only thing more remarkable than the Vektron's $1995 price tag is the fact that the standard version sells for $200 less. We tested a P-100 loaded with 4MB of video memory, but for most people the usual 2MB is adequate and would save 10 percent off the price. The system doesn't have fast system memory or burst cache so it won't set any speed records, but it does perform like the average P-100 desktop we've tested, which means it can more than handle your applications.

Vektron

The Vektron comes equipped with 8MB of standard RAM, 256K of secondary cache, an 852MB hard drive, and a 15-inch monitor (13.5-inch viewable area). As its name indicates, it also features full multimedia, including a Toshiba quad-speed CD-ROM drive, 16-bit Creative Labs sound card, and Sound Blaster speakers. If you want to play video clips, its Diamond Stealth64 Video VRAM board will make them run smoothly. There's also a 14.4-kbps fax-modem; while it's not the fastest modem you can get these days, it features voice capabilities (the application software bundle includes Delrina's fax and communications combo as well as a simple voice-mail program). The minitower case houses room for two extra storage devices and five additional add-in cards, including up to three PCI cards. Vektron's one-year warranty is on the slim side, but the company bolsters it with 11 hours of toll-free support on weekdays and extra hours on Saturday. On-site service costs $50. We haven't received enough survey responses from Vektron customers to rate its service and reliability, but if you're a bargain hunter you can't ignore this multimedia offer.

11 Tempest Pentium Giga Media P5-100

NEW THIS MONTH

PROS: Great price, big hard drive, full multimedia

CONS: Low-quality monitor, no system manual

Check this PC's price against its features list and you won't believe your eyes: Pentium-100 processor, 16MB of RAM, 256K of secondary cache, 1270MB hard drive, 15-inch monitor, quad-speed CD-ROM drive, and 14.4-kbps fax-modem, all for $1988. That's about the most you'll find for the money on our budget chart. Its

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Diamond Stealth64 with 2MB of DRAM is a solid graphics card, even if it doesn't boast the video acceleration features we're seeing in more systems these days, and the software is mostly from Microsoft, including Works, Money, and Encarta.

On the downside, the Tempest Pentium Giga Media turned in slightly below average results for a P-100 desktop. Moreover, the 15-inch monitor (13.4-inch viewable area) is painfully generic, with one of the lowest horizontal scan rates of any bundled monitor we've seen, and the fax-modem and 16-bit sound card are not of the same quality as the ones we've seen in most other multimedia PCs. The full-size tower case has lots of space inside. If you want to install storage devices, you'll like the five open drive bays. There are also two free PCI and ISA slots each (one shared).

Tempest Pentium

Tempest's support policies leave a bit to be desired: one-year parts warranty, 30-day money-back guarantee, and two-day turnaround on factory repairs. Toll-free tech support is available for 10.5 hours on weekdays and seven more hours on Saturdays. You can purchase on-site service for up to three years at a cost of $149 per year—one of the most expensive on-site programs we've encountered. But that's the only time you'll hear the word *expensive* associated with Tempest's Giga Media. That the company can offer so much for so little is truly remarkable.

12 Vektron PCI P-75

REVIEWED: July 1995

PROS: New, superlow $1550 price, decent speed

CONS: No CD-ROM drive, one-year warranty, tech support during business hours only

13 Netis 5100 Media

NEW THIS MONTH

PROS: Great price, impressive performance, full multimedia

CONS: Crowded interior, one-year parts warranty

Power at a low price usually means that the vendor has skimped on features—but not so with the 5100 Media. Not only did this Pentium-100 powerhouse come loaded with 16MB of RAM, 256K of secondary cache, and a whopping 1624MB hard drive, it ripped through our performance tests, posting a score 13 percent higher than the typical P-100 we've tested. And at $2390, it's cheaper than our average P-100 systems.

For the multimedia enthusiast, the Netis 5100 Media includes a quad-speed CD-ROM drive and a Creative Labs 16-bit sound chip, as well as a Diamond Stealth64 Video PCI board with 2MB of speedy VRAM that can accelerate full-motion video clips and support resolutions up to 1600 by 1200. The system's 15-inch monitor (which has a 13.9-inch viewable area) is programmable and can support refresh rates up to 72 Hz at 800 by 600 resolution.

Netis 5100 Media

The compact desktop case houses slots for two extra PCI cards, two ISA cards, and one additional PCI or ISA card. There are also four free drive bays and two open SIMM sockets. But because of the compact design, which puts the CD-ROM drive in the topmost of the three externally accessible bays, you'll have to remove this drive to upgrade the bays below it. Netis's support policies are mediocre. The company offers a one-year parts, three-years labor warranty, and toll-free tech support is available 10 hours on workdays and 6 hours on Saturdays. A year of on-site service is free. While the support is average, the system is not—the 5100 Media is easy on the budget and powerful on the desktop.

14 Gateway 2000 P5-100

REVIEWED: November 1995

PROS: Good price, 16MB of RAM, big hard drive, lots of software, three-year warranty

CONS: No sound card or speakers

15 Polywell Poly 4120P8

REVIEWED: December 1995

PROS: Good price, big hard drive, full multimedia, great warranty

CONS: Cluttered interior makes it difficult to upgrade components

16 Compaq ProLinea 575

REVIEWED: September 1995

PROS: Well-built system from a company with excellent service and reliability

CONS: No CD-ROM drive, smallish 630MB hard drive

17 Quantex QP5/75 M-1

REVIEWED: September 1995

PROS: Just $1699 for a full multimedia system and lots of software

CONS: One-year warranty, limited expandability options

18 Quantex QP5/90 M-3

REVIEWED: March 1995

PROS: Good performance, 16MB of RAM, big hard drive, 17-inch monitor

CONS: One-year warranty

19 Austin PowerPlus 75

REVIEWED: May 1995

PROS: Full multimedia features, good documentation

CONS: Outdated 8-bit sound card, below-average reliability

20 Digital Venturis 575

REVIEWED: September 1995

PROS: Price down to $2169, good speed, excellent reliability and service

CONS: Small 425MB hard drive, supersmall 14-inch monitor

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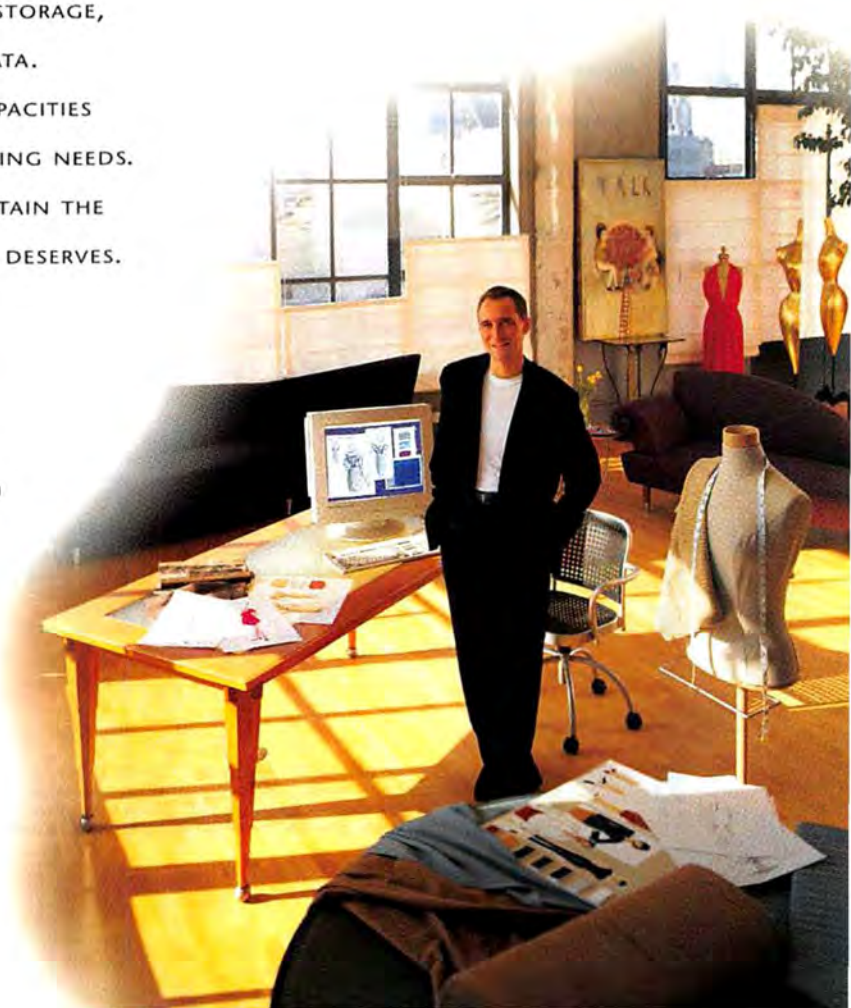

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THE TOP 20

PC WORLD

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	2	Dec 95	108	73	82/73	$4649	Pentium-90	8	720
2	Dell Latitude XPi P90T	2	3	Nov 95	106	71	77/73 [3]	$5399	Pentium-90	16	810
3	Dell Latitude XPi P75D	3	3	Nov 95	105	61	77/73 [3]	$3899	Pentium-75	16	810
4	Toshiba Satellite Pro 400CDT	–	1	current	104	65	82/73	$4649	Pentium-75	8	810
5	NEC Versa 2000C	4	2	Dec 95	103	46	68/71 [3]	$2795	DX4-75	8	540
6	Toshiba Satellite T2130CT	5	2	Dec 95	102	44	82/73	$3299	DX4-75	8	520
7	AST Ascentia 950N/75	–	1	current	101	63	67/68 [3]	$4049	Pentium-75	8	810
8	WinBook XP DX4-100	6	2	Dec 95	101	59	68/70	$4159	DX4-100	16	810
9	Texas Instruments TravelMate 5100	7	3	Nov 95	101	66	62/76 [3]	$5898	Pentium-90	16	1215
10	Texas Instruments TravelMate 5000	8	4	Oct 95	100	58	62/76 [3]	$4799	Pentium-75	8	810

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	3	Nov 95	96	50	77/73 [3]	$2629	DX4-100	8	420
2	Gateway 2000 Liberty DX4-100	–	1	July 95	95	54	67/72 [3]	$2599	DX4-100	8	352
3	MidWest Micro SoundBook II	–	1	current	95	51	66/[3]	$2299	DX4-100	8	720
4	Austin StepLite DX4-75	2	2	Sep 95	94	38	68/[3]	$2138	DX4-75	8	340
5	CTX EzBook 390T	–	1	current	93	43	[3]	$2399	DX4-100	8	420
6	Sharp PC-3010	3	5	Sep 95	93	33	[3]	$1899	Cx486DX2-66	8	324
7	Austin Vista Notebook	–	1	Oct 95	92	43	68/[3]	$2738	DX4-100	8	810
8	WinBook XPC	5	4	Oct 95	92	30	68/70	$2519	486DX2-50	16	351
9	CTX EzBook 200D	6	5	Sep 95	91	36	[3]	$2298	DX4-75	8	340
10	Acom Patriot 4000 F	7	3	Nov 95	91	49	[3]	$2150	DX4-100	8	543

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 December 22). Touch-tone phone required.

2 **Dell Latitude XPi P90T**
Pentium has a great battery.

1 **Dell Latitude LX 4100D**
Fast budget note.

2 **Gateway 2000 Liberty DX4-100**
Excellent price, battery life.

	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"	800/457-7772	3721	683	Ultrafast subnote has full-size features, long battery life, top-rated reliability.
	7.2	6:38	CA/10.3"	800/613-3355	3712	684	Speedy, lots of RAM, roomy hard drive, highly rated support.
	7.2	6:18	CD/10.4"	800/613-3355	3713	685	Not as fast as power Best Buys, but still quick and nicely priced for P-75.
	9	4:46	CA/10.4"	800/457-7772	3728	686	Sole multimedia note on chart is fast with good sound, 2X CD-ROM.
	7.8	6:28	CA/9.5"	800/632-4636	3722	687	Least expensive power notebook features good speed, long battery life.
	7.4	5:40	CA/10.4"	800/457-7772	3723	688	Well-rounded DX4-75 has roomy keyboard, internal power supply, excellent reliability.
	7.2	4:44	CA/10.3"	800/876-4278	3729	689	First Pentium in AST's well-regarded notebook line is a strong performer.
	7.6	4:01	CA/10.3"	800/468-2162	3724	690	Fastest DX4-100 we've tested; robust configuration, choice of pointing devices.
	7.6	6:09	CA/10.4"	800/848-3927	3714	691	Expensive P-90 has huge hard drive, lots of RAM, long battery life.
	6.4	5:47	CA/10.3"	800/848-3927	3710	692	Weighs like a subnotebook; fine display and good battery life.
	7.4	5:48	CD/10.4"	800/613-3355	3716	693	Adequate DX4-100 speed and long battery life; solid reliability and service.
	6.6	6:47	CD/10.4"	800/846-2000	3700	694	$400 price drop, light weight, and great battery life makes a Best Buy.
	7	2:56	CD/10.3"	800/871-9128	3730	695	Inexpensive, large hard drive, but battery life is short.
	6	6:19	CP/9.3"	800/321-1501	3726	696	Featherweight notebook with terrific battery life is also inexpensive.
	6.8	4:48	CA/10.4"	800/888-9052	3731	697	Lightweight, low-cost, long-lasting—and only color-active display on budget list.
	7.2	5:14	CD/10.4"	800/237-4277	3705	698	Least expensive on chart.
	7.8	4:02	CP/11.3"	800/321-1501	3732	699	Near-$300 price drop, roomy hard drive, large display.
	7.2	4:34	CD/10.3"	800/468-2162	3711	700	Budget offering is slowest Top 20 note but has lots of RAM.
	7.6	5:49	CP/10.3"	800/888-9052	3706	701	Solid performer has large screen and fine battery life.
	7.8	3:12	CP/10.2"	800/898-2665	3719	702	Performs well, but battery life could be longer.

[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. 907.

Top 20 Notebooks

WITH THE ADDITION THIS MONTH OF THE $4049 AST Ascentia 950N/75 and the $4649 Toshiba Satellite Pro 400CDT, the number of Pentium notebooks on the chart is up to seven. High prices still prevail, but expect them to fall as more vendors sell Pentium notebooks and as P-120 models begin to appear on the market.

The power quotient in the budget section is also on the rise. Over half the systems featured this month use a DX4-100 processor, including the new $2299 MidWest Micro SoundBook II and the $2399 CTX EzBook 390T. The lightweight Gateway 2000 Liberty DX4-100, with its remarkable battery life of nearly 7 hours, earns a Best Buy this month now that it sells for $2599. The Austin Vista Notebook, with its DX4-100, also adds power to the budget list after a $300 price drop.

Power Notebooks

1 Toshiba Portégé 610CT

REVIEWED: December 1995

PROS: Fast, compact design, over 5 hours of battery life, three-year warranty

CONS: Cramped keyboard

The $4649 Portégé 610CT subnotebook weighs just 6.4 pounds and delivers some of the best performance we've seen from a Pentium-90 portable. It comes with 8MB of EDO RAM, a 720MB hard drive, 16-bit sound, and a 9.5-inch active-matrix color display. Readers who responded to our survey rate Toshiba's service highly, but they absolutely love the reliability of Toshiba notebooks.

2 Dell Latitude XPi P90T

REVIEWED: November 1995

PROS: Fast, excellent battery life, good documentation, three-year warranty

CONS: Pricey

The $5399 price is a bit prohibitive, but there are no compromises with this notebook. It is 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. The bright 10.3-inch active-matrix screen displays up to 16.8 million colors, and Dell support is dependable.

3 Dell Latitude XPi P75D

REVIEWED: November 1995

PROS: Fast, over 6 hours of battery life, lots of RAM and hard disk space, three-year warranty

CONS: None

4 Toshiba Satellite Pro 400CDT

NEW THIS MONTH

PROS: Internal CD-ROM drive, infrared port, good battery life, top-rated reliability

CONS: Pricey

Yes, at 9 pounds the Toshiba Satellite Pro 400CDT is heavy, but it's a portable Pentium-75 with full multimedia, including an internal CD-ROM drive. Just leave the external floppy drive at home and the travel weight is down to 7.8 pounds. And sure, $4649 is a lot to pay for a notebook, but when you consider what you get, the 400CDT offers a major bang for your buck. And it's fast: On our benchmark tests, the 400CDT garnered the third-best overall performance score for a P-75 notebook. Everything you'd expect in a portable is here, including 8MB of EDO RAM and a generous (albeit not removable) 810MB hard drive. The system's lithium ion battery delivered 4.75 hours on our rundown tests, which is exceptional considering the hardware it supports.

Toshiba

The 400CDT features a 10.4-inch active-matrix color VGA display that supports up to 16.8 million colors, an infrared port for wireless data transfer, and two stacked Type II PC Card slots, which can alternately hold a single Type III card. A nice feature is an external volume control so you can play multimedia CDs through the sound system without having to go through software to adjust the volume. In addition, the keyboard is sturdy and large with a built-in, eraser-style trackpoint that works better than many we've seen. The software package is lean, consisting of little more than Toshiba's notebook utilities and some audio applications, but the user's manual is comprehensive and easy to follow. The company's support policies are okay, including a one-year warranty and round-the-clock technical support. Respondents to our fax-back survey give thumbs up to Toshiba for making reliable notebooks. At a lofty $4649, the 400CDT ain't cheap, but if your business requires full-fledged multimedia on the road, you'll be hard-pressed to do better.

5 NEC Versa 2000C

REVIEWED: December 1995

PROS: Good DX4-75 performance, 6.5-hour battery life, internal fax-modem

CONS: No weekend technical support

6 Toshiba Satellite T2130CT

REVIEWED: December 1995

PROS: 5.7-hour battery life, built-in sound, three-year warranty, no AC adapter

CONS: Active-matrix color screen hard to view at certain angles

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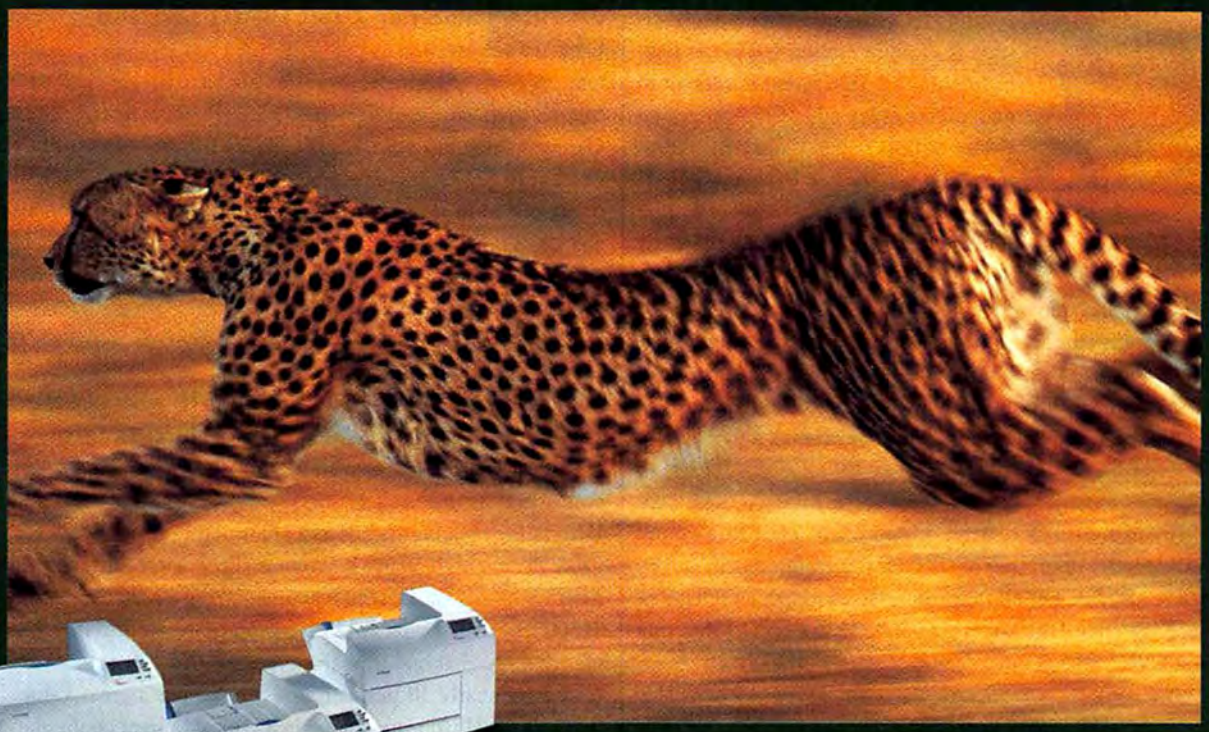

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Circle 178 on reader service card

7 AST Ascentia 950N/75

NEW THIS MONTH

PROS: Built-in sound and speaker, infrared capabilities, three-year warranty

CONS: Low ratings in reliability and service

At $4049, AST's Ascentia 950N/75 is a strong contender on our power notebook chart. It features a Pentium-75 processor, 8MB of RAM, 256K of secondary cache, and a roomy 810MB removable hard drive. Moreover, its performance ranks up there with P-75 notebooks from companies like Dell, IBM, and Toshiba.

As we've come to expect from the Ascentia line, the 950N/75 is well-built for the rigors of travel. It's a reasonable 7.2 pounds, and its lithium ion battery delivers a respectable 4.75 hours of operation (not the marathon battery life of previous Ascentias, but not bad for a Pentium notebook). The display is a 10.3-inch Super VGA active-color screen that can handle up to 65,536 colors. For cursor control, the Ascentia uses an eraser-style trackpoint embedded in the keyboard, but we often found it difficult to manipulate efficiently.

AST Ascentia

The 950N/75 has plenty of extras, including two stacked PC Card Type II slots that can also accommodate a Type III card, an infrared port for wireless data transfer, plus 16-bit sound and a built-in speaker and microphone. Power management is achieved with a keystroke (the system also suspends when the case is closed). The 950N/75 comes with excellent manuals and a range of bundled software, including Tranxit (for infrared data transfer), Delrina Win/Fax (for fax-modem communications), and a host of sound-related applications.

AST provides extensive support policies, including a three-year warranty, round-the-clock toll-free support, and a fast turnaround of one business day on factory repairs. However, our recent survey shows that readers are not entirely impressed with AST's reliability and service. Even so, the Ascentia 950N/75 is a good value in a power notebook.

8 WinBook XP DX4-100

REVIEWED: December 1995

PROS: Fast, 16MB of RAM, big hard drive, several pointing-device options

CONS: No voice software to go with voice-fax modem, one-year warranty

9 Texas Instruments TravelMate 5100

REVIEWED: November 1995

PROS: 6-hour battery life, huge 1215MB hard drive, multimedia configuration

CONS: Pricey

10 Texas Instruments TravelMate 5000

REVIEWED: October 1995

PROS: Lightweight, fast, long battery life

CONS: Documentation lacks detail, mouse buttons tough to master

Budget Notebooks

1 Dell Latitude LX 4100D

REVIEWED: November 1995

PROS: Fast, almost 6 hours of battery life, large screen, three-year warranty

CONS: Cramped keyboard

At $2629, the Latitude LX 4100D remains the top buy among budget notebooks, thanks in part to its 5.8-hour battery life. It weighs in at 7.4 pounds and features 8MB of RAM, a 420MB hard drive, and a 10.4-inch color dual-scan display. Readers are especially pleased with the reliability of Dell notebooks.

2 Gateway 2000 Liberty DX4-100

REVIEWED: July 1995

PROS: Inexpensive, lightweight, good performance, great battery life

CONS: Dull screen, awkward pointing device

Gateway 2000 has cut the price on its Liberty DX4-100 over 13 percent to $2599. It comes with 8MB of RAM and a 352MB hard drive, but most importantly, it runs for nearly 7 hours on a single charge. The 6.6-pound Liberty's color dual-scan display looked washed-out, but with a diagonal measurement of 10.4 inches, you can fit a lot on the screen.

3 MidWest Micro SoundBook II

NEW THIS MONTH

PROS: Terrific price, good performance for a DX4-100, excellent support policies

CONS: Flimsy design, small keyboard

With today's soaring speeds and plummeting prices, it takes a good value to rank high on our budget notebook list. Enter the MidWest Micro SoundBook II, which at an amazing $2299 is priced nearly $1500 less than a typical DX4-100 portable. Add to that a performance score that outstrips the average DX4-100 notebook we've tested by nearly 10 percent, and you've got a great value. The SoundBook II we tested came in a typical budget configuration—8MB of RAM, upgradable to 36MB, and 128K of secondary cache—but the note's 720MB hard drive is the largest on the budget chart. The nickel–metal hydride battery gave us 3 hours of life (relatively short), and the entire system weighed 7 pounds (6.4 pounds without the floppy drive).

MidWest Micro

The SoundBook II features a 10.3-inch dual-scan display that supports 640-by-480 resolution and up to 256 colors. It also comes with built-in 16-bit sound, speakers, and microphone, and two stacked Type II PC Card slots that can alternately hold a Type III card. The case isn't as sturdy as those of some better-known competitors, such as Dell and Gateway 2000, and the keyboard is smaller than optimal—we found ourselves accidentally hitting the touchpad pointing device located in the

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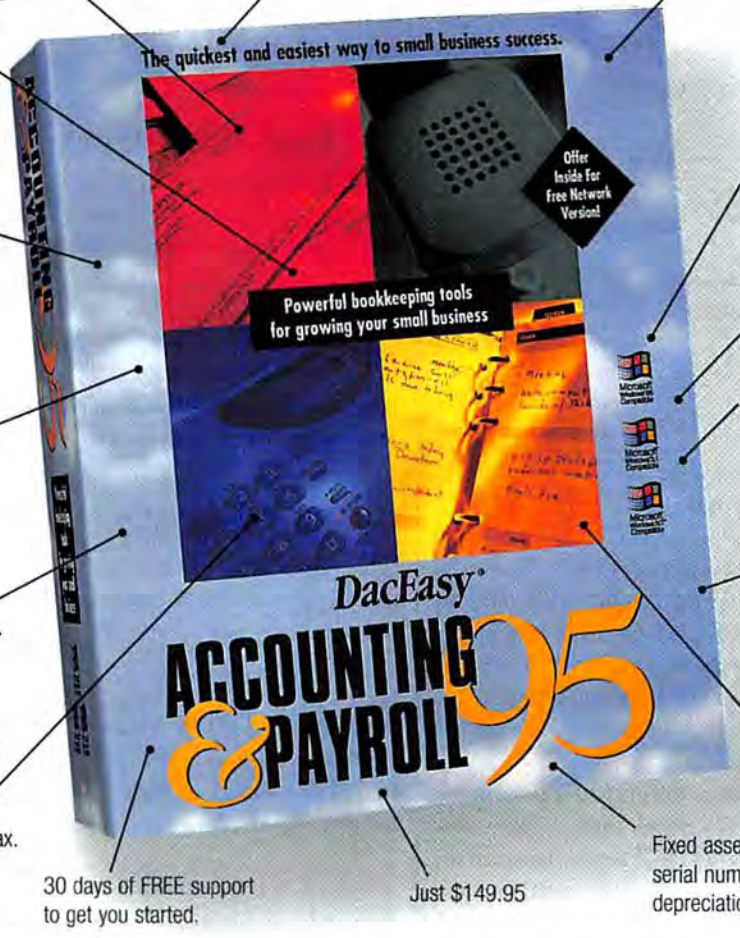

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Circle 77 on reader service card

wrist rest. The system charges while running on AC power and features a dedicated suspend button, but it won't automatically suspend when the case is closed.

MidWest Micro's support policies are comprehensive, including a three-year warranty on parts and labor, a 30-day money-back guarantee, and a three-day turnaround policy on factory repairs. Toll-free tech support is available 10 hours on weekdays and 6 hours on Saturdays. Though we haven't received enough survey responses from MidWest Micro users to fully evaluate the company's service and reliability, the evidence so far indicates that consumers are generally more happy with MidWest Micro's notebooks than with its desktop systems.

4 Austin StepLite DX4-75

REVIEWED: September 1995

PROS: Long 6.3-hour battery life, fax-modem, ethernet adapter

CONS: Performance lags a bit in some Windows applications

5 CTX EzBook 390T

NEW THIS MONTH

PROS: Great price, lightweight, good battery life

CONS: Sluggish performance, keyboard feels poorly crafted

The CTX EzBook 390T is a very good bargain if you're not intent on having the fastest portable on the block. For only $2399, this DX4-100 notebook delivers 8MB of RAM, a 420MB removable hard drive, and an active-matrix color screen that's easy on the eyes. In addition to its low price, the EzBook's slim, 6.8-pound design and 4.8-hour battery life are perfect for business on the road.

CTX EzBook 390T

The big, 10.4-inch display delivers sharp VGA graphics at up to 256 colors. A miniature LCD display between the screen and the keyboard provides information on such things as disk activity and battery status. With the EzBook, you can use a Type III card and still have room for a Type II card (most notebooks can handle either two stacked Type II slots or a single Type III card). The EzBook also has built-in sound, speaker, and microphone for basic multimedia applications, and a well-written system manual that includes a detailed addendum on the touchpad pointing device—a technology that can be tricky to use if you're unfamiliar with it. The keyboard, however, is a disappointment. Jammed close to the screen, it's uncomfortable to operate without inadvertently hitting the touchpad, which is built into the wrist rest. The keys have a cheap, unresponsive feel and are crowded together, making typing harder.

CTX's support policies have improved in recent months. The company offers a two-year warranty, round-the-clock toll-free support, and a 30-day money-back guarantee. Although we haven't received enough survey responses from CTX users to evaluate its service, our spot checks of CTX's technical support line turned up reasonable wait times and fairly knowledgeable assistance. While not a speed demon, the CTX EzBook 390T is light on the lap and extremely easy on the pocketbook. If you're looking for a lightweight notebook to complement your desktop PC instead of replacing it, consider the EzBook.

6 Sharp PC-3010

REVIEWED: September 1995

PROS: Inexpensive, long battery life, excellent screen, GlidePoint touchpad, infrared capability

CONS: Somewhat limited support policies

7 Austin Vista Notebook

REVIEWED: October 1995

PROS: Big 810MB hard drive, 11.3-inch display, 24-hour support available

CONS: Sluggish performance for a DX4-100 notebook, one-year warranty

8 WinBook XPC

REVIEWED: October 1995

PROS: Decent price, 16MB of RAM, 14.4-kbps internal fax-modem

CONS: Slow 486DX2-50 processor, one-year warranty

9 CTX EzBook 200D

REVIEWED: September 1995

PROS: Low price, good battery life, comfortable keyboard and touchpad

CONS: No weekend technical support available

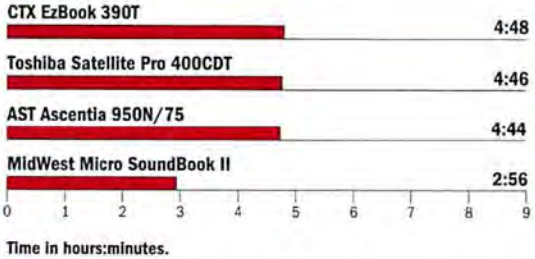
10 Acom Patriot 4000 F

REVIEWED: November 1995

PROS: Low price for DX4-100 with 543MB hard disk, good performance

CONS: One-year warranty, sparse documentation, awkward pointing device

TEST REPORT Battery Life



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.

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

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FEATURES COMPARISON This Month's Contenders–Desktops

● = Yes ○ = No

n/a = not applicable

Standard features	CompuTrend Premio 5x86-100	Micro Express MicroFlex-PCI/586	Netis 5100 Media	Quantex QP5/133 SM-2	Tempest Pentium Giga Media P5-100	Vektron Multimedia P-100
Street price as of 09/28/95 [1]	$1799	$1799	$2390	$3399	$1988	$1995
CPU	Cyrix 5x86-100	Cyrix 5x86-100	Pentium-100	Pentium-133	Pentium-100	Pentium-100
CPU or upgrade socket	237-pin ZIF	237-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF	320-pin ZIF
BIOS	AMI 10/10/94	Phoenix v4.04 Plug and Play v3.0 7/24/95	AMI v1.00.02 5/17/95	AMI v1.00.02 5/17/95	Award Plug and Play v1.0A 3/9/95	Award v4.50GP 1/10/95
Installed/maximum RAM (MB)	16/64	16/128	16/128	16/128	16/128	8/128
SIMM sockets/number free	3/1	4/2	4/2	4/2	4/2	4/2
Secondary RAM cache installed/maximum (K)	256/512	256/512	256/512	256/512	256/2048	256/256
Case style	compact desktop	minitower	compact desktop	tower	tower	minitower
Free externally accessible 3½-inch/5¼-inch drive bays	0/2	1/2	1/2	0/3	1/2	1/1
Free internal 3½-inch/5¼-inch drive bays	1/0	1/0	1/0	4/0	2/0	0/0
Free 16-bit ISA/8-bit ISA expansion slots	3/0	4 [2]/0	3 [2]/0	1 [2]/0	2 [2]/0	2 [2]/0
PCI or VL bus slots/number free	PCI/2	PCI/2 [2]	PCI/3 [2]	PCI/3 [2]	PCI/3 [2]	PCI/3 [2]
Hard disk	Quantum Fireball 1080A	Quantum Fireball 1080A	WD Caviar 31600	WD Caviar 31600	Samsung PLS-31274A	Conner CFA850A
Size (MB)	1080	1080	1624	1624	1270	852
Adapter	integrated	integrated	integrated	integrated	integrated	integrated
Floppy drives (MB)	1.44	1.44	1.44	1.44	1.44	1.44
Graphics adapter	Number Nine 9FX Motion531	STB Velocity 64V	Diamond Stealth64 Video VRAM	ATI Mach64	Diamond Stealth64 DRAM	Diamond Stealth64 Video VRAM
Installed memory (MB)/type	2/DRAM	2/VRAM	2/VRAM	2/VRAM	2/DRAM	4/VRAM
Monitor	Premio FS62DU	GVC Technology M1566	Proton GM-1563M	MAG DX17F	Sceptre	ADI MicroScan 4V/LM-1564
Tube/viewable area (diagonal inches)	15/13.8	15/14.1	15/13.9	17/16	15/13.4	15/13.5
Dot pitch (mm)	.28	.28	.28	.26	.28	.28
Modem speed for fax/data (kbps)	n/a	n/a	n/a	14.4/28.8	14.4/14.4	14.4/14.4
Sound board	Creative Labs Vibra 16	n/a	integrated 16-bit	Ensoniq 9525	OEM 16-bit	Creative Labs Vibra 16
CD-ROM drive	Goldstar GCD-R540B	Toshiba XM-5302B	Acer Sertek DCS Multimedia World C645	Toshiba XM-5302B	Mitsumi CRMC FX400C	Toshiba XM-5302B
Data transfer rate (K/sec)	600	600	600	600	400	600
Parallel/serial/mouse ports	1/2/0	1/2/0	1/2/0	1/2/0	1/2/0	1/2/0
Service and support						
Warranty for parts/labor (years)	2/2	2/2	1/3	1/1	1/life	1/1
30-day money-back guarantee	○	●	●	●	●	●
On-site service first-year price	$169 [3]	free	free	free	$149	$50
Repair turnaround policy (days)	5	2	3	1	2	3
Daily toll-free phone support (hours)	10	24	10	11	10.5	11
Weekend support	○	●	● [4]	● [4]	● [4]	● [4]
Online support sites	BBS	○	BBS, CompuServe, World Wide Web	BBS, Prodigy, World Wide Web	○	BBS, CompuServe, World Wide Web
Automated fax support	●	●	●	●	●	●

[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] On-site service available for three years only.

[4] Saturdays only.

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.

Acma sPower P90

PROS: PC Card bay, multimedia, voice/data/fax-modem

CONS: Only 1MB of graphics RAM, one-year warranty

The PC Card slots in this $2049 P-90 minitower are great for exchanging data with notebooks, but the drivers dragged down the PC's performance. Overall, it's a minimal Win 95 configuration, with 8MB of RAM and a 540MB hard drive. *Acma Computers, 800/786-6888* **Reader service no. 761**

AST Bravo LC P/75 850W

PROS: Performance compares with Pentium-75

CONS: Pricey, no CD-ROM drive, one-year warranty

Don't let its name fool you: The $2649 AST Bravo LC P/75 is based on a 100-MHz Cyrix 5x86 processor. It comes with 16MB of RAM and a 850MB hard drive, but it has no multimedia components and the graphics system is weak. *AST Computer, 800/876-4278* **Reader service no. 762**

Diamond DT-AS120

PROS: Low price, very fast

CONS: No sound card, 14-inch monitor, one-year warranty

Amazingly, the Diamond DT-AS120 with its AMD DX4-120 processor outperformed most P-90s we've tested. For just $1600 you get 16MB of RAM, a 540MB hard drive, and a quad-speed CD-ROM drive in a compact desktop case. If its reliability and service ratings were higher, it would have made the budget chart. *Diamond Technologies, 800/989-7253* **Reader service no. 763**

EPS P120 Pinnacle

PROS: PC Card bay, full multimedia, 28.8-kbps fax-modem

CONS: Poor marks for reliability and service

The $3795 EPS P120 Pinnacle we tested was loaded with extras, including 32MB of RAM and a tape backup drive. But the additional drivers slowed performance, and despite a three-year warranty, readers responding to our survey were disappointed in EPS's systems and support. *EPS Technologies, 800/447-0921* **Reader service no. 764**

IBM Aptiva 2144-M50

PROS: Multimedia, huge software bundle, three-year warranty

CONS: Extremely slow performance, limited upgrade space

This $2688 IBM Aptiva P-100 is built for the home, loaded with 8MB of RAM, a 1080MB hard drive, quad-speed CD-ROM drive, sound and speakers, a voice/data/fax-modem, an enviable software bundle, and IBM's highly regarded service and support. Unfortunately, this desktop system is over 20 percent slower than the average P-100, partly because it lacks a secondary cache. *IBM Personal Computer Co. 800/426-2968*

Robotech CobraXL DX4-120

PROS: Quad-speed CD-ROM drive, 16-bit sound, PerfectOffice

CONS: Slow for an AMD DX4-120, just 1MB of graphics RAM

Robotech's $1799 AMD-based DX4-120 desktop PC performs slower than the average Intel DX4-100 system we've tested. In addition, you may find its 8MB of RAM and 540MB hard drive on the sparse side when it comes to Win 95 computing. *Robotech, Inc., 800/533-0633* **Reader service no. 765**

SmartWorks MT54HI133S

PROS: Good performance, 1624MB hard drive, full multimedia

CONS: Poor-quality 15-inch monitor

SmartWorks' $3549 Pentium-133 minitower with quad-speed CD-ROM drive narrowly misses the Top 20. It comes with lots of graphics software, including CorelDraw, Asymetrix 3D F/X, and Digital Video Producer, but its two-year warranty, $65 on-site service, and 9-hour weekday support don't compare well with the big hitters. *SmartWorks, 800/441-2210* **Reader service no. 766**

Notebook Snapshots

These notebooks were tested and reviewed along with the others but didn't score high enough to reach the Top 20 charts.

AST Ascentia 950N/90

PROS: Built-in sound, infrared capabilities, Super VGA display

CONS: Expensive

A P-90 portable, the 7.2-pound Ascentia 950N/90 is just slightly faster than its P-75 sibling (number seven on the Power Notebooks chart), but at $4999 it's much more expensive. Its 4-hour battery life is good, but not what we've come to expect from the Ascentia line. *AST Computer, 800/876-4278, 714/727-4141* **Reader service no. 767**

CompuAdd P90 ColorScan

PROS: Big hard drive, 10.4-inch color-active screen

CONS: Poor battery life, cheap keyboard, one-year warranty

With its P-90 processor, 810MB hard drive, and decent performance scores, the $3875 CompuAdd P90 ColorScan looks like a serious contender. But spotty support policies and an appalling 1.3-hour battery life hurt this 8-pound notebook. *CompuAdd Corp., 800/627-1961* **Reader service no. 768**

Digital HiNote Ultra CT475

PROS: Lightweight, CD-ROM drive, great support

CONS: Pricey, small hard drive for a power notebook

With its CD-ROM attachment in place, the HiNote Ultra CT475 still weighs only 6.8 pounds. For a DX4-75 it's fast, and its battery delivers nearly 5 hours of operation. This multimedia notebook has a 528MB hard drive and a 9.5-inch active-matrix color screen, but for $4538 we expected both to be bigger. *Digital Equipment Corp., 800/344-4825* **Reader service no. 769**

IBM ThinkPad 755CX

PROS: Superior design, big hard drive, Super VGA display

CONS: Expensive, mediocre battery life

The new 7.2-pound ThinkPad 755CX has so much going for it, you want to overlook its $5249 price tag. It comes with a Pentium-75 processor, 8MB of RAM, 256K of secondary cache, and an 810MB removable hard drive. The keyboard is perhaps the finest we've ever seen on a portable PC, and its internal voice/data/fax-modem is ready for handling all your telephony needs. Performance is slightly below average for a P-75, though, and its 3-hour battery life is on the short side. *IBM Personal Computer Co., 800/426-2968*

Micro Express NP96P100

PROS: Great price, SVGA screen, 14.4-kbps PC Card modem

CONS: Heavy, short battery life

A $2999 price is great for a P-90 notebook with 16MB of RAM, an 810MB removable

hard drive, and a 10.1-inch active-matrix color display. But 8.8 pounds is heavy considering there's no CD-ROM drive, and the two NiMH batteries have only 2.4 hours of life. *Micro Express, 800/989-9900, 714/852-1400* **Reader service no. 770**

MPC CD-Note 900

PROS: Good price, CD-ROM drive, big display

CONS: Heavy, relatively short battery life, one-year warranty

At 9.4 pounds, the $2699 MPC CD-Note 900 is one of the bulkiest notebooks we've seen. This DX4-100 includes a CD-ROM drive and a large, 11.3-inch color dual-scan screen, but its cramped keyboard and 2.8-hour battery life make it a less than ideal choice for portable computing. *MPC Technologies, 800/672-9979* **Reader service no. 771**

FEATURES COMPARISON This Month's Contenders–Notebooks

●=Yes ○=No

n/a=not applicable

Standard features	AST Ascentia 950N/75	CTX EzBook 390T	MidWest Micro SoundBook II	Toshiba Satellite Pro 400CDT
Street price as of 9/28/95 [1]	$4049	$2399	$2299	$4649
CPU	Pentium-75	DX4-100	DX4-100	Pentium-75
Traveling weight (pounds) [2]	7.2	6.8	7	9
Width x depth x height (inches)	11.5 x 8.4 x 1.9	11.1 x 8.5 x 2.1	10.9 x 8.6 x 1.8	11.8 x 9.2 x 2.2
Installed/maximum RAM (MB)	8/40	8/32	8/36	8/40
Secondary RAM cache installed/maximum (K)	256/256	0/0	128/128	0/0
Installed/maximum hard disk (MB)	810/1200	420/810	720/720	810/810
Removable hard disk	●	●	○	○
Display type	color active	color active	color dual-scan	color active
Measured screen diagonal (inches)	10.3	10.4	10.3	10.4
Maximum colors of LCD	65,536	256	256	16.8 million
Simultaneous LCD and external monitor	●	●	●	●
Highest resolution of external monitor	1024 x 768	1024 x 768	1024 x 768	1024 x 768
Mouse/keyboard ports	●/● [3]	●/● [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	n/a	n/a
Docking station available	●	●	○ [4]	○ [4]
PC Card slot Type II/III	2/1 [5]	1/1	2/1 [5]	2/1 [5]
Power management				
Supports Advanced Power Management	●	●	●	●
Type of battery	lithium ion	NiMH	NiMH	lithium ion
Suspend button	●	●	●	●
Suspends when case closed	●	○	○	●
Service and support				
Warranty (years)	3	2	3	1
30-day money-back guarantee	○	●	●	○
On-site/replacement service first-year price	n/a	n/a	n/a	n/a [6]
Repair turnaround policy (days)	1	2	3	varies [6]
Daily toll-free phone support (hours)	24	24	10	24
Weekend support	●	●	● [7]	●
Online support sites	BBS, CompuServe, Prodigy	BBS, World Wide Web	BBS, World Wide Web	BBS, CompuServe
Automated fax support	●	●	●	●

[1] All notebooks priced as configured with DOS 6.0 or later version, Windows 3.1, VGA monochrome or better 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] $50 per year for 2-day turnaround.

[7] Saturdays only.

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There's one safety precaution you should observe before you travel: always use Kingston® memory in your laptop.

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Circle 128 on reader service card

Warning: Seat Belts Recommended.

If this doesn't bring you to the edge of your seat, nothing will. It's ViewSonic's 17EA 17" (16" viewable) multimedia monitor with sharp, crisp images and built-in stereo speakers that put you right in the middle of the action.

Here's how our engineers describe it: 85 Hz refresh rate at 1,024 x 768, resolutions up to 1,280 x 1,024, a 0.28 mm dot pitch and maximum refresh rate of 120 Hz.

Here's how our marketing people describe it: stunning visual and audio clarity, flicker free viewing, precisely focused screen image, sharp vivid colors and optimal viewing quality.

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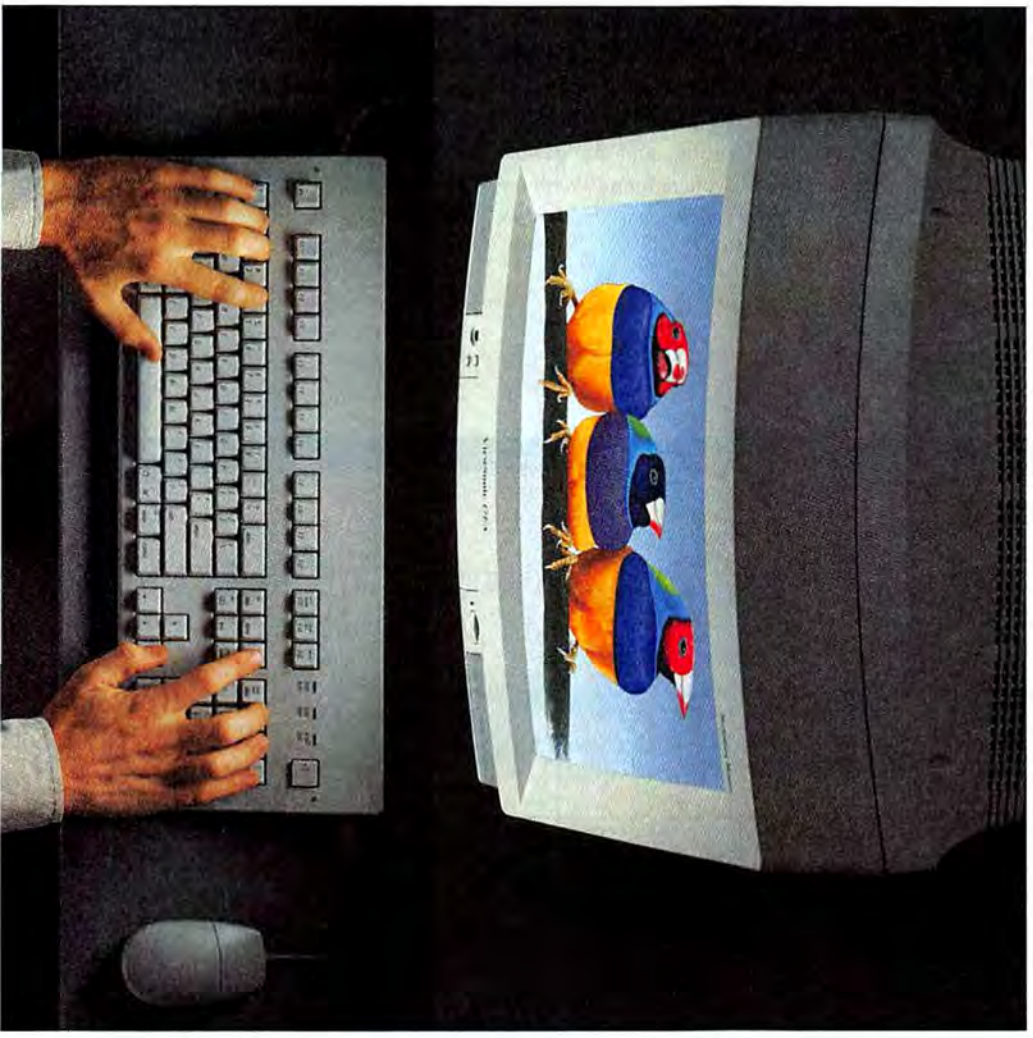

color control allows you to make precise color adjustments.

And here's one for the 'believe-it-or-not file.' We have an actual, living engineer standing by to answer your questions. Just call our toll-free number and we promise he'll talk to you in plain language, no techno-speak.

There's Plug & Play+ connectivity to support Windows® 95. Both PC and MAC® compatibility. And a limited 3 year warranty on parts, CRT and labor. We even offer an optional Express Exchange Service℠ program.*

We must be doing something right.

Until recently, we've concentrated on corporate America, selling millions of products to some of the country's most demanding customers. When VARBusiness magazine recently polled them on 17" (various viewable) monitors, ViewSonic finished first among a field consisting of the likes of Sony, NEC, MAG Innovision, and Samsung. After all the votes were tallied, ViewSonic was found to be "the perfect combination of low price and high quality."

The last thing you think about shouldn't be last.

If you're like most people, you're very particular about the computer system you choose, then you leave it up to the salesman to bundle it with a monitor, a keyboard and all the rest.

That's wrong.

You should have a choice when it comes to your monitor. And you do. Exercise it. After all, it's ultimately what you're going to be staring at and listening to for hours on end.

We could go on and on. But in the case of the ViewSonic 17EA, seeing and hearing is believing. So call (800) 888-8583 (Dept. 467) for a dealer where you can do just that. And hang on to your seat.

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• *Requires DDC-compatible video card. © 1996 ViewSonic Corporation. Corporate names and trademarks are the property of their respective companies.

Circle 224 on reader service card

Panasonic V41

PROS: CD-ROM drive, built-in sound and speakers

CONS: Very expensive, heavy, smallish hard drive

Except for its $4599 price tag, the 9.6-pound Panasonic V41 is a good multimedia notebook. Its 10.5-inch active-matrix color screen, 3-hour battery life, and three-year warranty are commendable, but its DX4-100 processor and 450MB hard drive can't compare with the processors and large storage capacities of other notebooks on the power chart. *Panasonic Personal Computer Co., 800/662-3537* **Reader service no. 772**

SwanNote Plus

PROS: Decent price, big hard drive

CONS: Short battery life, one-year warranty

The $3299 SwanNote Plus comes with a Pentium-90 processor, 8MB of RAM, 256K of secondary cache, an 810MB hard drive, and an infrared port. We liked its 10-inch active-matrix color display and 7.2-pound travel weight, but its 1.9-hour battery life was very disappointing, and its performance was below average for a P-90 notebook. *Swan Technologies, 800/554-6748* **Reader service no. 773**

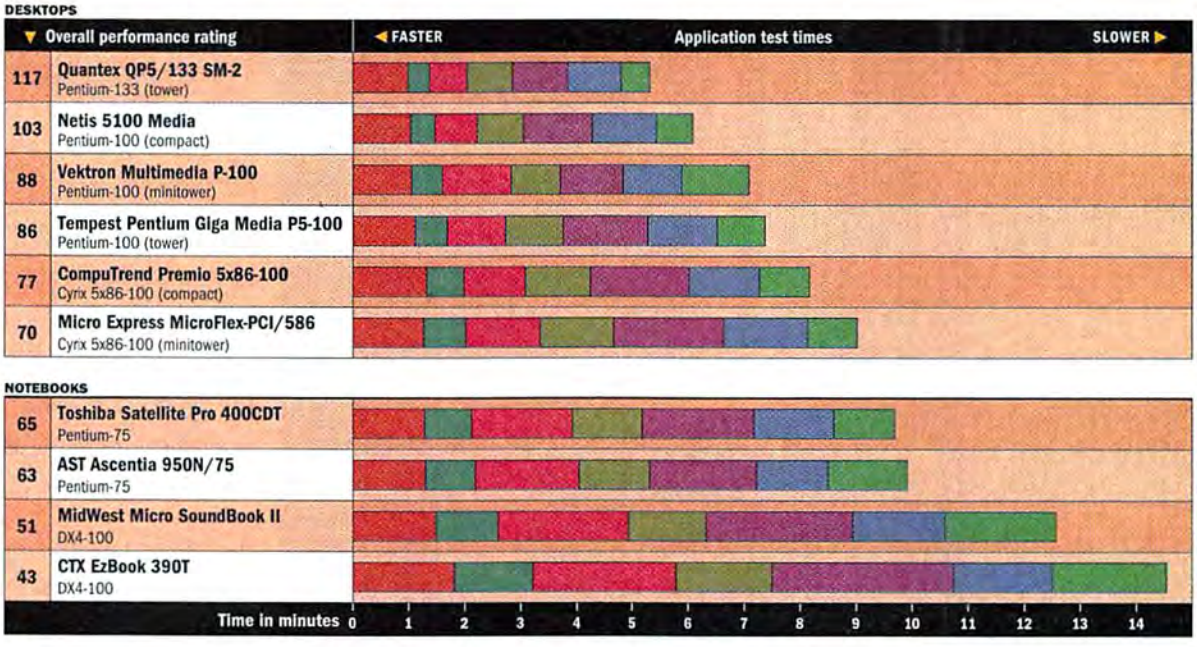
Twinhead Slimnote 890TX

PROS: Internal CD-ROM drive, infrared port, SVGA screen

CONS: Poor performance, short battery life, one-year warranty

The Twinhead Slimnote 890TX, although it comes with 16MB of RAM, a 524MB removable hard drive, a 10.25-inch active-matrix color screen, and other goodies, fails on four counts: It's expensive ($4795), weighs a hefty 10 pounds, fared poorly in performance tests against its Pentium-90 peers, and delivered a paltry 1.7-hour battery life. *Twinhead Corp., 800/995-8946* **Reader service no. 774**

TEST REPORT This Month's Contenders



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.

Introducing Adaptec EZ-SCSI 4.0 software.

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Circle 127 on reader service card

RELIABILITY AND SERVICE MONITOR

Win a Polywell Poly 4120P8

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 Polywell Poly 4120P8, a Best Buy AmDX4-120 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 1-SS, *PC World*, 501 Second St. #600, San Francisco, CA 94107-1496. Surveys must be received by January 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 (NCR) ○ 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
○ 91 ○ 92 ○ 93 ○ 94 ○ 95 ○ 96

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
○ 91 ○ 92 ○ 93 ○ 94 ○ 95 ○ 96

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 ○ 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.)

○ 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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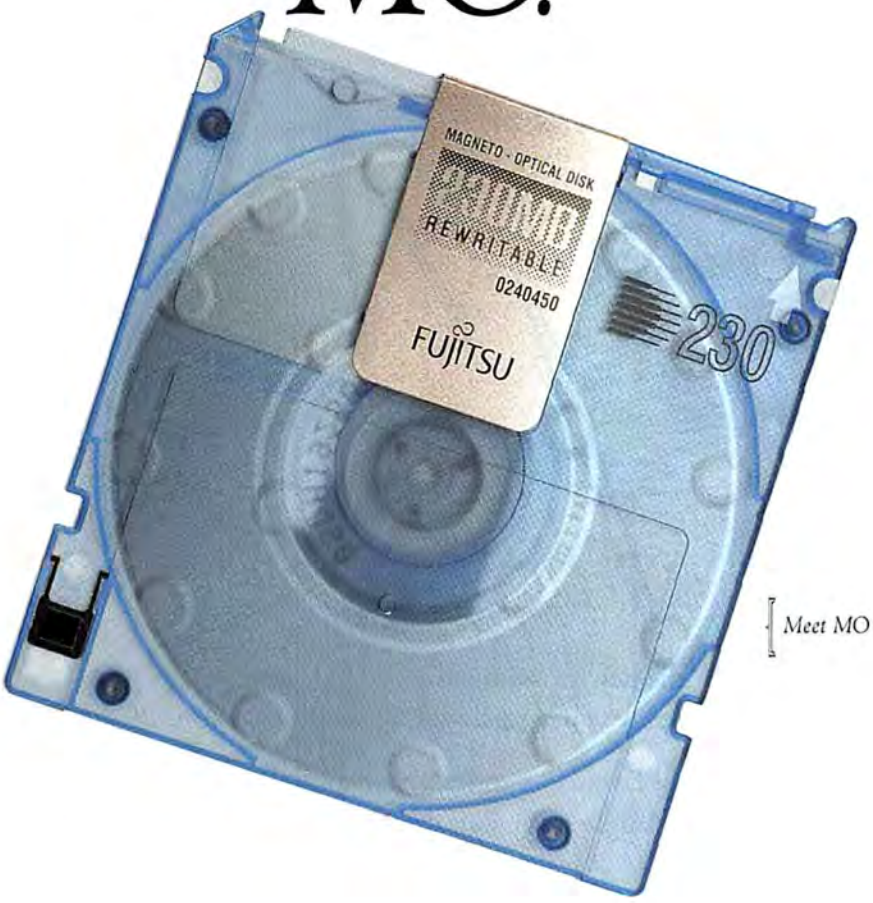

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Circle 24 on reader service card

Two Hot Numbers Debut: HP LaserJet 4M Plus and 4MV

A Workhorse with Oomph
Thanks to a hefty 12MB of RAM and a fast controller, the HP LaserJet 4M Plus is as fast as our Best Buy. It also comes with a JetDirect network card.

With the new year, we've made it over the decade's hump—and so has workgroup printer technology. Midrange network printers—those that print 8 to 16 pages per minute—are faster, smarter, and easier to use than they were five years ago, when the standard-setting HP LaserJet IIID was a 300-dots-per-inch, 8-ppm laser costing about $3595. Our monochrome Best Buy today, the Lexmark Optra R, offers high-quality 600-dpi, 12-ppm printing for $1487, less than half the price.

In the growing color category, price remains a sticking point. Lasers cost $4000 to $8000, although our Best Buy, the HP DeskJet 1600CM ink jet, costs just $1999. Nevertheless, the vendors have hit an important milestone: They all offer software that makes it easy for anyone to produce expert-looking output.

HP Lasers Make Their Mark

The monochrome chart shuffled noticeably this time around. A $75 price drop on the Okidata OL1200 caused it to switch places with the Brother HL-960; now the Okidata sits at fourth place, while the Brother takes fifth. Of the five printers we reviewed this month, only two HP lasers made it onto our monochrome chart. At $1899, the HP LaserJet 4M Plus, debuting in sixth place, is priced a few hundred dollars more than its 600-dpi, 12-ppm peers, but you get a lot for the money. Thanks to a faster 25-MHz controller and a hefty 12MB of RAM (most others come with 2MB or so), the 4M Plus matches the monochrome Best Buy Lexmark Optra R in speed and zips by the fifth-ranked Brother HL-960, even though the Brother uses the same Canon engine.

Despite its $2916 price, the highest on the monochrome chart, HP's LaserJet 4MV lands in seventh

TOP 10 WORKGROUP PRINTERS

	Last ranking	First reviewed	Type	Street price [1]	Overall rating	Output rating: Monochrome	Output rating: Color	Speed rating: Monochrome	Speed rating: Color	Features, ease-of-use rating	Reader service number		Comments
MONOCHROME													
1	1	Nov 95	laser	$1487	85	78	–	75	–	82	632	Lexmark Optra R 800/891-0331	Good speed and output on 600-dpi, 12-ppm printer.
2	2	Nov 95	laser	$1660	83	75	–	77	–	76	633	Texas Instruments microLaser PowerPro 800/848-3927	600 dpi, 12 ppm; fast, Apple LocalTalk standard.
3	3	Sep 95	laser	$2500	83	78	–	85	–	84	634	Lexmark Optra Lx 800/891-0331	Very fast, 600 dpi, 16 ppm; excellent software.
4	5	Nov 95	laser	$1199	83	76	–	76	–	64	635	Okidata OL1200 800/654-3282	Plug and Play; $75 price drop boosts rank.
5	4	Nov 95	laser	$999	82	73	–	49	–	72	636	Brother HL-960 800/276-7746	Needs external networking device; lacks PostScript.
6	–	current	laser	$1899	81	74	–	75	–	85	637	Hewlett-Packard LaserJet 4M Plus 800/752-0900	Network ready, 600 dpi, 12 ppm.
7	–	current	laser	$2916	81	71	–	95	–	84	638	Hewlett-Packard LaserJet 4MV 800/752-0900	Network ready, 16 ppm, prints full bleed at 11X17.
COLOR													
1	1	Nov 95	ink jet	$1999	76	63	57	29	81	75	639	HP DeskJet 1600CM 800/752-0900	Low cost, good plain-paper printing. A winner.
2	2	Nov 95	laser	$6499	73	85	85	23	47	82	640	Apple Color LaserWriter 12/600 PS 800/538-9696	Very slow but best color output; PostScript only.
3	3	Sep 95	laser	$5500	71	56	78	28	85	71	641	Xerox 4900 800/275-9376	New software has many tweaking options.

[1] Based on vendor estimates and PC World research.

BEST BUY

Methodology The ratings for features (which incorporates results of hands-on testing) and output quality weigh most heavily in the overall rating, 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. 904.

place. This printer, with a 16-ppm engine and a 33-MHz controller, is by far the fastest we've tested. Its versatile paper handling can take sizes from 5-by-7-inch to 11-by-17-inch. It can print full-bleed on ledger size, too—good for posters or fliers. Both HPs come with Ethernet and Localtalk standard.

The third monochrome laser we tested, QMS's new $3399 1660E, was too expensive and slow to make the chart. Tuned for graphics output, it can print at 1200 by 600 dpi resolution, and its maximum RAM capacity is a high 64MB. Even at 600 by 600 dpi, the 1660E's print quality was commendable, with fine line curves and gray-scale shading. But printers optimized for graphics often suffer in our business-oriented tests—so while the QMS printed briskly in CorelDraw, it bogged down in Excel and Word. The choice of network interfaces (ours came with Ethernet) is nice, but it adds to the cost.

You Want Fast? You Got It
HP's LaserJet 4MV is the fastest printer in the Top 10, and it can print full bleed on 11-by-17-inch paper. Its high price includes a standard JetDirect network card.

DeskJet 1600CM Stays on Top

The two new color lasers we reviewed this month—the Tektronix Phaser 540Plus and the Xerox XPrint 4920—were priced too high to make the Top 10. Our color Best Buy is still the HP DeskJet 1600CM color ink jet, which has very good 600-dpi print quality and a $1999 price that lasers can't beat.

Color workgroup printer vendors continue to struggle with high prices and slow speeds. But to their credit, they have made great strides in ease of use. With the recent introduction of Xerox's Intelligent Color software (on the new XPrint 4920 and retroactively on the third-ranked 4900), all printers now have sophisticated drivers that make your color output look great with little or no effort on your part. The software analyzes the different images on a page and prints each at its best quality—no more great text at the expense of smudgy photos or vice versa. The default settings we've tried print output that'll work just fine for general purposes. People who want to tweak the image can delve deeper to adjust tonal ranges, colors, and dot patterns.

The Xerox Xprint 4920 just missed a top spot due to its $7200 street price. Its output quality is very good, thanks in part to a finer grade of toner and the well-tuned default settings on its Intelligent Color driver. Unlike most color lasers, the 4920 prints on labels and envelopes, and it takes legal-size paper. Unfortunately, it does color printing on letter-size or A4 paper only, and its color performance was slow. Its sibling, the third-ranked 4900, has comparable output, costs less, and performed faster overall.

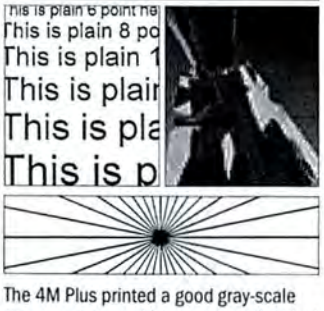
The $7645 Tektronix Phaser 540 Plus is a minor upgrade of its predecessor, the Phaser 540. Tektronix put in a faster processor and removed 8MB of RAM. The new hardware is a little faster, and its output quality is very good. The Tektronix has the reverse performance problem of the Xerox XPrint 4920, however: It prints fast in color but is extremely slow in monochrome. And despite a $500 price drop, the 540 Plus is still the most expensive color laser we've reviewed.

—Bill Underwood

Bill Underwood specializes in printer design, testing, and manufacturing. Testing performed by Ulrike Diehlmann of the PC World Test Center.

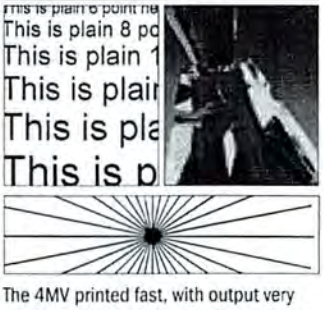
OUTPUT QUALITY SAMPLES A Trio of HPs—Two Lasers and the Best Buy in Color

HP LaserJet 4M Plus



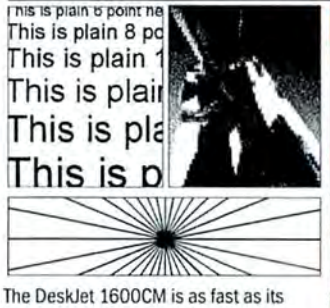
The 4M Plus printed a good gray-scale range and, as you'd expect, excellent text from its 600-dpi engine. The line art showed few bumps or wobbles.

HP LaserJet 4MV



The 4MV printed fast, with output very similar to that of its lower-price sibling at left. But it can print full-bleed on ledger paper–good for posters or fliers.

HP Deskjet 1600CM



The DeskJet 1600CM is as fast as its laser competitors and a lot cheaper. Its output is acceptable even on plain paper, and its color is especially nice.

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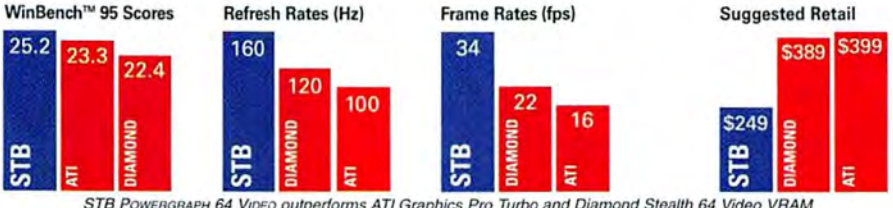

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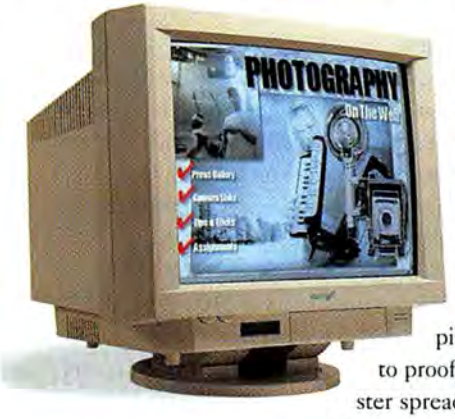
Circle 210 on reader service card

Epic Proportions: MAG Muscles Out Compaq



Simply MAGnificent: ***For true-to-life graphics quality and readable text for massive projects, the $1800 MAG MX21F beats down the competition to capture our top Best Buy.***

Although 19- to 21-inch monitors are synonymous with professional CAD use and document management, prices on these massive displays are falling. A low-end model costs as much as a high-end 17-inch monitor—around $1200. It's still a hefty chunk of change, and most smaller tubes offer a sharper focus and smaller dot pitch than larger models. But if you need to proof a full-page layout, read a whole monster spreadsheet without scrolling, or enhance a presentation in the conference room, a huge monitor can help. A 19- or 21-inch display can comfortably show up to four 640 by 480 windows simultaneously at 1280 by 1024 resolution. Not only do these big screens improve how you see your work, they may change how you get it done.

Of course, the trade-off for more screen area is less desk space. With many models weighing close to 75 pounds, make sure your desk is sturdy before wrestling one of these brutes out of the box. Also, before you move up to a big screen, check if your graphics card is capable of (at least) 24-bit color with a refresh rate of 75 Hz at 1024 by 768 or higher resolutions. If it can't, you can avoid screen-flicker eyestrain by upgrading to a higher-end graphics card that can match the refresh rates of the monitor.

Big Screen Bests

The best big monitor you can buy right now is the MAG MX21F at $1800. From viewing full-page layouts side by side to studying tiny legal print, top-notch image-quality scores make the MX21F a great choice. Its refresh rates are higher than most units—100 Hz at 1024 by 768 resolution—and the handy

TOP 10

19- TO 21-INCH MONITORS

		Street price	Overall rating	Text quality rating	Graphics quality rating	Features, ease-of-use rating	Viewable screen diagonal (inches)	Dot or stripe pitch (mm)	Max. refresh rate at 1024 X 768 (Hz)	Reader service number	Comments
1	MAG MX21F 800/827-3998	$1800	85	83	85	65	19.15	dot 0.28	100	621	Best graphics display, superb text, and high refresh; viewable area is smaller than other 21-inch screens.
2	Compaq QVision 210 800/345-1518	$2099	84	85	80	71	19.65	dot 0.26	85	622	Top text quality, excellent graphics, good refresh, Level 2b Plug and Play [1]; cumbersome on-screen menu.
3	NEC MultiSync XP21 800/632-4636	$2299	83	81	76	80	19.65	dot 0.28	76	623	Great text, very good graphics, Level 2b PnP, intuitive knobs and on-screen menu; standard refresh, expensive.
4	ViewSonic 21PS 909/869-7976	$1699	83	80	72	72	19.65	dot 0.25	104	624	Detailed text and graphics, high refresh, Level 2b PnP, ample on-screen menu; awkward user buttons.
5	CTX Multisync 2085 909/595-6293	$1229	83	69	72	60	18.8	dot 0.28	75	625	Great price for a 20-inch monitor, good graphics, Level 2b PnP, easy on-screen menu; standard refresh.
6	Mitsubishi Diamond Scan 20H 800/843-2515	$1549	83	62	67	83	19.1	dot 0.28	106	626	Low price, high refresh, extensive controls and image-adjusting software, Level 2b PnP; so-so text quality.
7	GoldStar 2010 201/816-2000	$1650	81	68	83	63	18.95	dot 0.28	80	627	Vivid graphics, good refresh rates, simple analog buttons and on-screen menu; text could be better.
8	Nanao FlexScan F221 800/800-5202	$2163	80	69	67	85	19.65	dot 0.28	115	628	Highest refresh, intuitive on-screen and button controls, Level 2b PnP; so-so text and graphics, expensive.
9	Sony MultiScan 20se 800/352-7669	$1999	76	81	73	56	19.1	stripe 0.3	100	629	Excellent spreadsheet detail, very good graphics, high refresh.
10	Smile CA 2111 800/876-4532	$1695	76	62	76	61	19.3	dot 0.28	76	630	Good graphics; so-so text quality, standard refresh at high resolutions.

[1] Plug and Play Level 2b adds a bidirectional capability between graphics card and monitor.

BEST BUY

Methodology We tested the monitors at a resolution of 1024 by 768 dpi, color depth of 65,536 colors, and a vertical refresh rate of 75 Hz. We used a Micron P90 PCI PowerStation with 16MB of RAM and a Diamond Stealth 64 PCI graphics adapter with 4MB of DRAM. Display quality accounts for 50 percent of the overall rating, features is 25 percent, price is 20 percent, and service and support is 5 percent. 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.

Full-Sized, Yet Compaq: ***Best Buy Compaq QVision 210 is superb for both text and graphics projects. Though its on-screen controls are a tad awkward, its 0.26 dot-pitch, Level 2b Plug and Play, and better-than-average refresh rates make this monitor a great choice.***

LCD display next to the control panel shows you the exact level of each adjustment, such as vertical and horizontal position, barrel distortion, and image tilt. Our only gripes: It's not Plug and Play capable, and the MX21F's viewable area measures 19.15 inches, making it the smallest 21-inch monitor in this roundup.

Our other Best Buy is the Compaq QVision 210. This 21-inch unit is second only to the MAG for accurate tonal highlights, shadow detail, and flesh tones in graphics, and it's tops with text, thanks to a tight 0.26-mm dot pitch. The QVision 210 is $299 more than the MAG, but you get Level 2b Plug and Play support and a 19.65-inch viewable area. However, it's not as easy to use as the MAG. Compaq's on-screen menu gives precise control over image geometry, but it took us seven button clicks to center the image, compared to pressing one button on the MAG.

NEC's 21-inch MultiSync XP21 earns the bronze, thanks to impressive spreadsheet detail and accurate-looking graphics. We also appreciated the full-featured yet easy-to-use design. Fiddling with the brightness and contrast is simple enough using the knob controls, but the Level 2b Plug and Play support and the breadth, precision, and simplicity of the Windows-based control menu make this monitor very easy to use, according to our panel of judges. For example, the automatic fill-to-edges command gives you a big image without distortion, and you can sharpen focus as the monitor ages. On the other hand, the MultiSync XP21 is the highest-priced unit on the chart—$2229—and refresh rates are a standard 76 Hz at both 800 by 600 and 1024 by 768.

A Gentle Giant: ***At $2299, the NEC MultiSync XP21 is pricey, but the excellent Windows-based on-screen menu lets you fine tune the display with surprising ease. Text is sharp, and graphics look very good.***

The fourth-place ViewSonic 21PS and the fifth-ranked CTX Multisync 2085 have aggressive prices and identical overall ratings, and they support Level 2b Plug and Play. But a look at the numbers shows different strengths and weaknesses. ViewSonic's forte is text, while the CTX's is graphics. For $400 more, the ViewSonic offers better features than the CTX (a 0.25-mm dot pitch versus the CTX's 0.28-mm dot pitch); significantly higher refresh rates (104 Hz versus 75 Hz at 1024 by 768); and, as a 21-incher, almost an inch more viewable area. We did, however, find the CTX much easier to use than the ViewSonic. The CTX's control buttons interact more logically with the on-screen menu, while the ViewSonic requires a cumbersome series of button pushes.

In a recent PC World survey, buying preferences for massive monitors were the same as for smaller 17-inch units: Image quality first, then price and features.

Sizing Up the Rest

Text didn't look as good as graphics on the Mitsubishi Diamond Scan 20H, but higher refresh rates, Level 2b Plug and Play, and a large 19.1-inch viewable area gave it the second best score for features. Our judges also liked the flexible set of image-adjustment and color-management utilities. And with a $1549 street price, the Diamond Scan 20H is one of the lowest priced monitors on the chart. For $100 more, the 20-inch GoldStar 2010 has a smart design that made the controls easy to tweak. Although text quality was only adequate, vivid images earned the 2010 the second-best graphics score of the pack.

Nanao's FlexScan F221 scores a Top 10 berth, thanks to a strong array of features such as extensive and easy-to-decipher controls, Level 2b Plug and Play, and the highest refresh rates around. However, we expected better text and graphics scores for this $2163 monitor; it's the second-highest–priced unit here.

You can expect great-looking spreadsheets, crisp graphics detail, and high refresh rates from Sony's MultiScan 20se, but a large .30-mm stripe pitch and cryptic control panel techniques hold this $1999 monitor down in ninth place. For $304 less, Smile's CA 2111, at the bottom of the chart, does a tad better with graphics and is easier to adjust than the MultiScan 20se—but its text score ties with the Diamond for lowest.

Just Off the Screen

We were surprised that some name-brand models failed to make this list. For example, the Panasonic Panasync Pro C-2192P is good with text and graphics, has a 0.25-mm dot pitch, and Level 2b Plug and Play, but awkward controls and standard refresh rates kept this $1750 unit off the Top 10. The Radius MultiView 21 has the same faults, costs $300 more, and is backed by a brief one-year warranty.

Next month, look for our recap of 15-inch monitors; in May we'll be back with an update of this list.

—Charles Seiter and John Goddard

Charles Seiter is a contributing editor for Macworld *and John Goddard is a staff editor for* PC World. *Testing by Susan Silvius of the PC World Test Center.*

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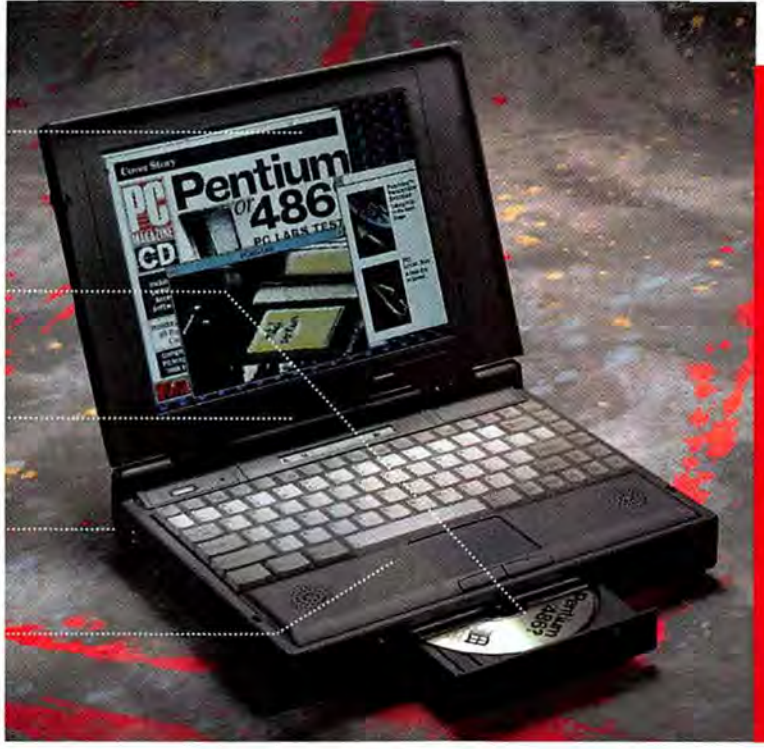

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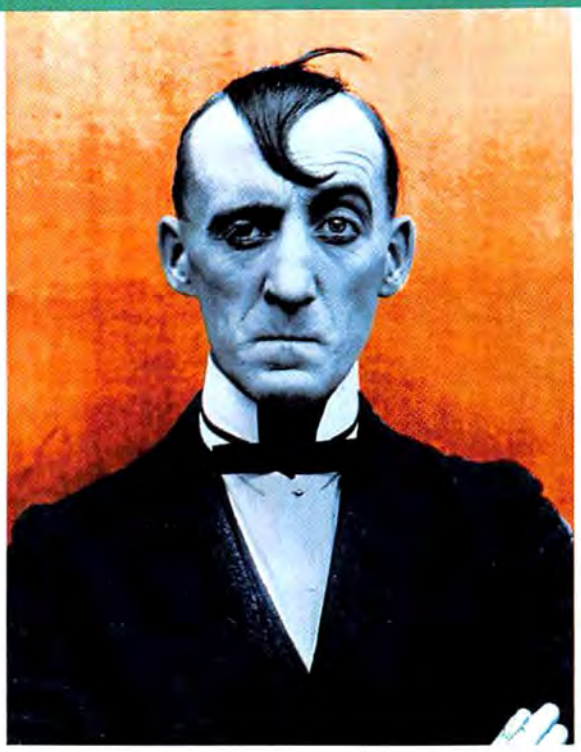

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STB Powers Its Way to Number 2

Back on Familiar Ground
The Powergraph 64 Video is the latest STB board to earn a Best Buy, thanks to solid performance and features.

Diamond's monopoly on Best Buys came to an end this month after we tested STB Systems' new $250 Powergraph 64 Video accelerator board. Both the Powergraph 64 Video, our new number 2 Best Buy, and the board it eked past, the Diamond Stealth64 Video 2201XL, use the same S3 Trio64V+ chip set, which has built-in support for MPEG playback and TV tuner cards. But the Powergraph does a better job of running business applications, which we weigh more heavily in our scoring. It also comes in a VESA local bus version that works in many existing 486-based systems.

Of the two other new boards we tested this month, the Hercules Graphite Terminator Professional came closest to joining the Powergraph on the chart. With 2MB of high-speed VRAM and the video-enabled S3 Vision968 chip, the Terminator turned in some of the fastest numbers ever in our business applications, as well as impressive scores in graphics apps. Moreover, Hercules' Touch software utilities, which control things like resolution and color depth, are among the finest we've seen. Only its $335 street price and cumbersome installation kept the Hercules board off the chart. The third new board we tested, the $189 Diamond Stealth64 Graphics 2201, was very slow in business applications and fell short of the Top 10.

This month we also tested new drivers for the ATI Graphics Xpression, Diamond Stealth64 Video 2200XL, and Number Nine 9FX Motion771. The Xpression showed enough improvement across the board to move up the chart slightly, while the 2200XL made big gains in QuarkXPress to hold its ground. The 9FX Motion771, however, tumbled down the chart due to significantly lower marks in CorelDraw and Freelance Graphics.

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	Sept 95	$269	84	83	85	120	S3 Vision968/ 2/VRAM	601	Top performance; has less software than Diamond's XL line.
2	STB Powergraph 64 Video 214/234-8750	–	current	$250	82	76	78	120	S3 Trio64V+/ 2/DRAM	602	Built-in MPEG and TV tuner support, EDO RAM, lifetime warranty.
3	Diamond Stealth64 Video 2201XL 800/468-5846	2	Nov 95	$233	81	72	85	100	S3 Trio64V+/ 2/DRAM	603	Built-in MPEG and TV tuner support, weekend tech support.
4	Matrox MGA Millennium 800/361-1408	4	July 95	$329	79	72	87	120	MGA-2064W/ 2/WRAM	604	Tops in graphics; 3-D acceleration, great software; no VL version.
5	Philips Paradise Bahamas 64 800/568-9272	5	Feb 95	$169	79	67	72	75	S3 Trio64/ 2/DRAM	605	Formerly sold by Western Digital; no video acceleration.
6	STB Velocity 64 Video 214/234-8750	6	July 95	$299	79	74	81	120	S3 Vision968/ 2/VRAM	606	Solid in business and graphics applications; lifetime warranty.
7	Diamond Stealth64 Video 2200XL 800/468-5846	7	July 95	$233	79	72	82	100	S3 Vision868/ 2/DRAM	607	July drivers are strong; big software bundle, weekend tech support.
8	ATI Graphics Xpression 905/882-2600 ext. 1	9	Sept 94	$174	79	65	78	75	ATI Mach64/ 2/DRAM	608	June drivers boost speed; good value; slow in business apps.
9	Number Nine 9FX Motion771 800/438-6463	3	July 95	$290	79	78	78	150	S3 Vision968/ 2/VRAM	609	High refresh rates; strong performer despite slower July drivers.
10	Umax Maxmedia Graphics 68D 800/562-0311	8	Dec 95	$180	78	66	81	120	S3 Vision868/ 2/DRAM	610	Low-cost, no-frills video card; slow in business applications.

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, and 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, street price, features, and support policies. For all ratings, higher is better.

Windows 95–certified Plug and Play.

For more information about all products in this table, circle reader service no. 901.

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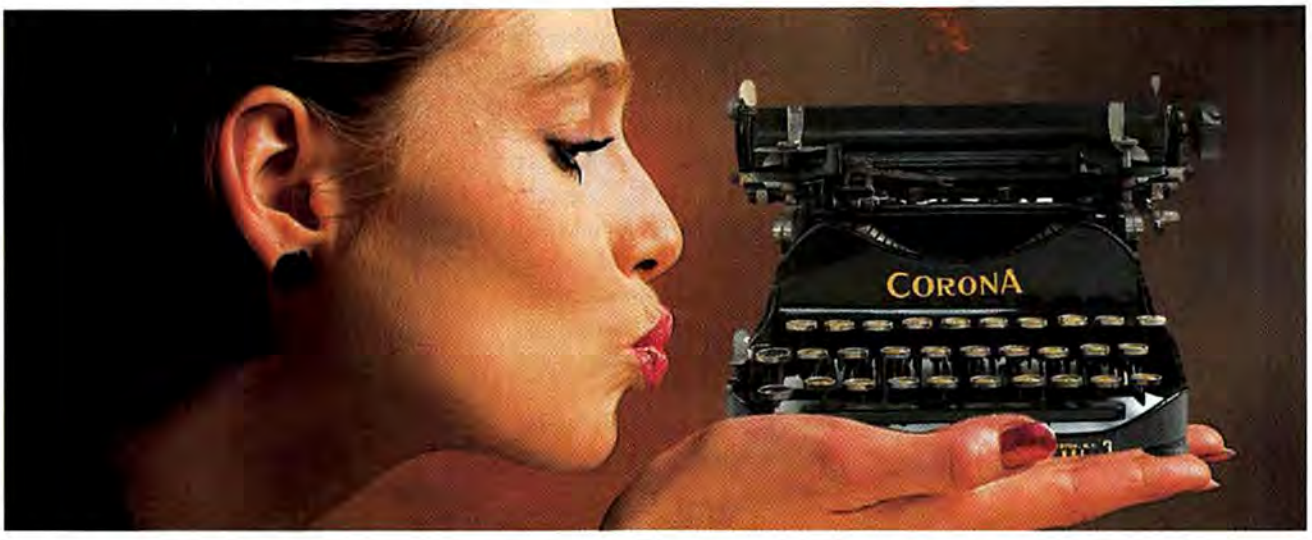

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U.S. Robotics' Courier: The Fastest in the Land

U.S. Robotics Courier V.Everything with V.34
Web wanderers take note: USR's latest and this month's number eight modem is the best performer we've seen yet, and it can connect at 33.6 kbps.

Even in marathons, lead runners often cross the finish line just seconds apart. Our top modems are in equally tight competition. While U.S. Robotics' Sportster maintains its narrow lead for a third month, MaxTech's recent support upgrade (the company added a World Wide Web site) and Practical Peripherals' reduction of the software bundle with its PC288LCD V.34 (it used to bundle QuickLink II and WinFax Lite 3.0; now it's just the former) helped to edge MaxTech's XM288E to a Best Buy. This $174 modem is a well-rounded package, and you'd be hard pressed to find one for less money. Practical Peripherals' $359 PC288LCD V.34, now in third place, is still ideal for those who want extra features such as an English-language status display.

The most exciting development this month is U.S. Robotics' souped-up Courier V.Everything modem. The company now includes 33.6 kbps in its latest Courier, so we put it back on the test bench—and got record-breaking results. This modem supports both the V.Fast Class and the much less prevalent V.32ter protocol—hence the name *V.Everything*. Only a few modems offer 33.6 kbps now, but we should see more of them show up over the year when 33.6 kbps becomes part of the official V.34 specification. This month's contenders that fell short of the chart are: Archtek's SmartLink 2834A ($209), Ven-Tel's Passport 288 ($225), and MultiTech's MultiModem II MT2834BA ($459) and MultiModemZDX MT2834ZDX ($219).

What about Plug and Play? The bad news: None of the modems we've tested has received Microsoft's Plug and Play certification yet. The good news: If you run Windows 95, installing an external modem is easy. We expect to see the first Plug and Play external modems within a few months.

TOP 10 MODEMS

Last ranking		First reviewed	Street price external/internal (ISA)	Overall rating	Throughput rating	Connect rating	Features, ease-of-use rating	Reader service number	Comments
1	U.S. Robotics Sportster V.34 Faxmodem 800/342-5877	1	Nov 95	$219/ $199	86	77	88	78	611	Top combo of performance, low price keep this tiny titan at no. 1 for third month straight.
2	MaxTech XM288E 800/936-7629	3	Nov 95	$174/ $145	85	81	73	76	612	Hard-to-beat price for a solid unit, and has VoiceView voice-data switching.
3	Practical Peripherals PC288LCD V.34 770/840-9966	2	Nov 95	$359/ –	84	85	82	81	613	Expensive, but fast—and one of the easiest-to-use modems we've tested.
4	Motorola ISG Power 28.8 Data/ Fax Modem 800/566-3266	4	Nov 95	$300/ –	83	78	92	74	614	Basic, but has excellent performance and superb support.
5	AT&T DataPort Express 800/482-3333	5	Nov 95	$219/ $199	83	80	72	73	615	Decent performance, quality support, and low price add up to solid value.
6	Microcom DeskPorte Fast V.34 800/822-8224	6	Nov 95	$391/ –	83	75	90	85	616	Pricey, but packed with unique features such as parallel port connect.
7	Zoom Telephonics V.34X 800/631-3116	7	Nov 95	$199/ $149	83	79	70	73	617	The price is right, and you get long support hours, but connect reliability could be better.
8	U.S. Robotics Courier V.Everything with V.34 800/877-2677	–	current	$400/ $390	83	85	90	82	618	Revamp of pricey, full-featured modem is best performer yet and now has 33.6 kbps.
9	Boca Research BocaModem V.34 28,800 External 407/997-8621	8	Nov 95	$221/ $199	83	75	80	75	619	Good performance, feature set; affordable; added World Wide Web site for support.
10	Practical Peripherals PM288MT II V.34 770/840-9966	9	Nov 95	$229/ $209	81	81	66	72	620	Attractive price and well supported, but had low connect reliability in our tests.

BEST BUY

Methodology We tested each modem using a pair of identical units, one at each end of a simulated public-service telephone network from Telecom Analysis Systems. We tested throughput and connect rates using a variety of file types and line conditions outlined in the Telecommunications Industry Association's TSB-37A and 38 specifications. We used vendor-supplied initialization strings. Data based on tests designed and conducted by the PC World Test Center. All rights reserved.

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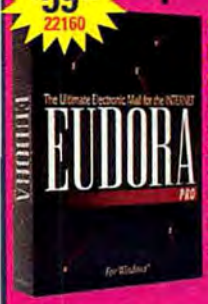

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HELP LINE Q&A

Put That Fax Machine to Work

Q Can I print to my fax machine from my PC's fax-modem (on the same phone line) and scan images into the computer from the fax machine?
Alex Eggenberger, Vancouver, British Columbia

A Infinity Computer Products makes Scan-By-Fax, a hardware-software combo that turns your fax machine into a general-purpose scanner/printer. About the size of a double audio CD set, Scan-By-Fax works with either one or two phone lines and comes with a 9-volt AC adapter and the Bit-Fax Professional communications program from Cheyenne Software.

However, printing and scanning resolution and overall quality are still determined by your fax machine. This might mean that you'll get a resolution as low as 200 dots per inch on thin, curly fax paper. If you have a plain-paper fax machine you're in luck, since they usually have resolutions of 300 dpi. You might also be limited to line-art scans only: Photographs and color art may well turn out like Rorschach images. Still, if you have a fax machine but no printer or scanner, and you don't mind the potentially poor quality, Scan-By-Fax is a worthwhile low-cost solution.

- **Scan-By-Fax** about $100 through mail order suppliers; Infinity Computer Products, Inc.; 800/275-7227, 610/539-9494
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What's at (General Protection) Fault?

Q When I try to run certain Windows 3.*x* applications, I get a General Protection Fault. For example, when I ran a Windows 95 demo, I got the message 'Application error. W95DDA8B caused a General Protection Fault in module W95DEMO.EXE at 0066:0129'.

What is a General Protection Fault, and what can I do to fix the problem?
Ben Lowrey, Rochester, New York

A Unfortunately, a General Protection Fault is just that—general. It means that a piece of code running on your computer has stepped on another's

Shortcut Keys Let You Open Applications From Anywhere

A WINDOWS 95 SHORTCUT KEY IS HANDY for opening an application that's on the desktop rather than on the taskbar and when another application is open and maximized. To assign a shortcut key, right-click the application's icon on the desktop, select Properties from the resulting menu, and click the Shortcut tab in the Properties dialog box. With the cursor in the Shortcut key edit box, enter a key combination beginning with Ctrl or Alt, or both. You cannot use the following in the combination: Esc, Enter, Tab, Space Bar, Print Screen, or Backspace.

You can also specify how the application should be opened on the desktop: as a button on the taskbar (minimized), in a full screen (maximized), or in a normal window.

For more information on the other settings in the Properties dialog box, right-click each setting's label, then click the What's This? button that pops up.

GORDON STUDER

toes, or more specifically, has attempted to write to another program's memory space. The error message you received indicates that the victim is w95demo.exe, but it's nearly impossible to tell what caused the problem. Chances are, it's another running program, but it could also be a DLL (a program module loaded behind the scenes) from w95demo.exe, or a hardware device driver.

If you save your files frequently, GPFs won't cause data loss, but they can drive you crazy. If you're willing to expend a little effort, you can probably track the culprit down by removing programs and drivers that are likely suspects one at a time until you can make the problem go away, then adding them back one at a time until you can make it reappear. Since you might have more than one GPF-causing piece of code, or the problem could result from a combination of pieces, this could take a lot of experimentation. On the other hand, you might get lucky and isolate the troublesome program or driver in just a few minutes. Once you've nailed down the source of the trouble, you can contact the program or driver manufacturer to see if a bug-free version is available.

Since you experience GPFs with a variety of programs, it's likely the problem is being caused by a driver that's always running. Video board drivers in particular are notorious for causing GPFs. You can rule this possibility out by installing the generic Windows VGA driver (for 16-color 640 by 480 resolution) in Windows' Setup program. If the problem persists, try skipping the contents of the start-up group when you launch Windows by holding down **<Shift>**, and make sure no programs launch through win.ini's 'load=' and 'run=' entries. If even that doesn't solve the problem, try booting your computer with config.sys and autoexec.bat files that contain only the bare minimum of entries.

Monitor Moderation

Q Does leaving the monitor on for days at a time, with only the screen saver software running, shorten its life? Wouldn't constantly turning it on and off do this too?
Karl Taeuber, Grosse Pointe, Michigan

A *Moderation in all things* are words to live by. Both activities you describe contribute to monitor wear and tear. A good compromise is to turn it off when you'll be gone for more than an hour. That way, the monitor will continue to work at least until it becomes obsolete.

Banish the Scarlet Letter

Q Somewhere in the course of evaluating new software, I have acquired a mysterious program icon—a red lowercase *a*, which appears briefly when Windows starts up. I have removed any new items from my start-up group and have checked the 'load=' and 'run=' lines in my win.ini file for programs, to no avail. Also, I am unable to switch to the renegade by <Alt>-<Tab>ing to it. Do you have any idea what it is?
Phil Mitchell, Boston

A It's Adobe Type Manager, which probably came with a program you installed. Like a few other Windows utilities, ATM installs itself as a Windows device driver, and it adds an icon for its Control Panel to Program Manager's Main group. If you want to use PostScript fonts along with Windows' TrueType fonts in your applications, leave ATM alone, and make sure that the 'Show Only TrueType Fonts in Applications' setting in the TrueType dialog box in Windows' Control Panel's Fonts applet is unchecked.

You can turn ATM off by using its own Control Panel, but you'll still see the icon when Windows starts. It will have a big *X* over it, letting you know that ATM is still installed but inactive. To banish the program entirely, open

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Adding a Second Hard Disk Without a Hitch

1. Turn off your computer, and install the new hard disk as the second (slave) drive following the instructions provided by the manufacturer.

2. Close and power up the computer. Following the drive manufacturer's instructions, enter the new drive's settings in your system's CMOS setup program. These days, most drives will autoconfigure; if so, just set the type to Auto. While you're there, write down the settings for the current drive. Save the settings and continue.

3. Enter fdisk at the DOS prompt to partition the new drive (see June and September 1995 *Help Line* for tips).

4. After rebooting, at the DOS prompt type format d: /s, where d: is the drive letter of the new hard disk.

5. If you're using Windows 3.*x* or Windows for Workgroups 3.*x*, click the 386 Enhanced icon in the Control Panel, select Virtual Memory • Change • Type, and set the swap file type to *Temporary* in the Virtual Memory dialog box.

6. From the DOS prompt or Windows' File Manager, locate and delete the following: orphaned .tmp files (you can enter set at the DOS prompt to find your system's temp directory); .chk files, which usually wind up in the root directory; and anything else you don't need around.

7. At the DOS prompt type dir c:*.* /ah /s and then dir c:*.* /as /s to find any hidden or system files. Use the attrib command to check the attributes of those files, then type attrib -h -r -s filename to remove hidden and system attributes from each of those files—except msdos.sys, io.sys, drvspace.bin, and dblspace.bin.

8. Issue the command xcopy c:*.* /s /v d:, where d: is the drive letter of the new hard disk.

9. Log on to drive d: and type attrib +h +s filename to restore the hidden and system attributes that you removed in step 8. Type attrib +r filename to restore the read-only attribute to those files you xcopied, since xcopy removes the attributes.

10. Power off the computer, open its case, and reverse the drives' master/slave roles following the manufacturer's instructions. Close the case and power up. In your system CMOS setup program, swap the settings for the two drives. Leave the contents of the old hard disk alone for a few days or a week until you're positive everything is working well.

the Windows directory's system.ini file in a text editor, change the line that reads 'system.drv=atmsys.drv' to **system.drv=system.drv**, and delete the line 'atm.system.drv=system.drv'. Finally, delete the \psfonts directory; the files atmcntrl.exe and atm.ini in the windows directory; and the files atm16.dll, atm32.dll, and atmsys.drv in the \windows\system directory. Deleting ATM will reduce your font options but will increase available memory and Windows' start-up speed.

The Compleat Editor

MS-DOS's edit.com is invaluable when you need to fix your config.sys, autoexec.bat, or Windows .ini files. But if you copy edit.com to a floppy disk to help in these cases, make sure you also copy qbasic.exe. Edit.com is just a tiny program that invokes the editor from Microsoft's QBasic interpreter; the real action takes place in qbasic.exe.

J. Paul Reed, Laurel, Montana

Brett Glass notes: You can also invoke the Qbasic editor by typing **qbasic /edit** *filename* at the DOS prompt. So, if you're creating an emergency disk, it's more important to include qbasic.exe than edit.com.

More on Adding a Hard Disk, Using Xcopy

Q In "Move Over, Little Drive..." (June 1995), you told readers that when adding a new hard drive to an existing system, they should make the new disk drive C:. You also suggested using xcopy to copy all the items from the current drive to the new drive. I think you should clarify your response, since xcopy won't copy hidden or system files on the original hard disk.

Chuck Lewis, Baltimore

A You're right, I should have noted that xcopy overlooks hidden and system files. I received several letters from worried readers, but no one reported errors due to a skipped file. Most people won't experience any problems if they format the new drive with the /s parameter, which installs the hidden DOS, DoubleSpace, and DriveSpace system files.

There's a hidden benefit to xcopy: It won't copy Windows' enormous permanent swap file, whose contents are always expendable. The first time you run Windows on the new drive, you'll get an error message asking if you want to create a new swap file. Once you do this, everything works fine.

The huge hard disks you can pick up for a song these days are bound to be much faster than your existing unit, so it makes sense to install the newer hard disk as the primary drive. You can skip the error messages and grab every hidden file by following my new and improved method for dumping the contents of one hard disk into another, in "Adding a Second Hard Disk Without a Hitch." This information is tailored to DOS/Windows 3.*x*. Next month I'll offer advice for Windows 95 users.

By Scott Spanbauer

Scott Spanbauer is a contributing editor for PC World. Help Line *welcomes your questions and tips and pays $50 for published items. See page 12 for contact information.*

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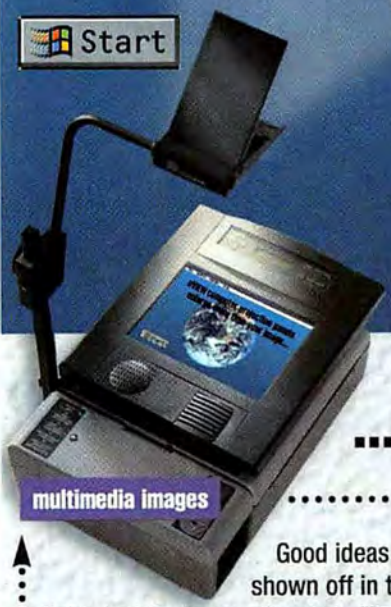

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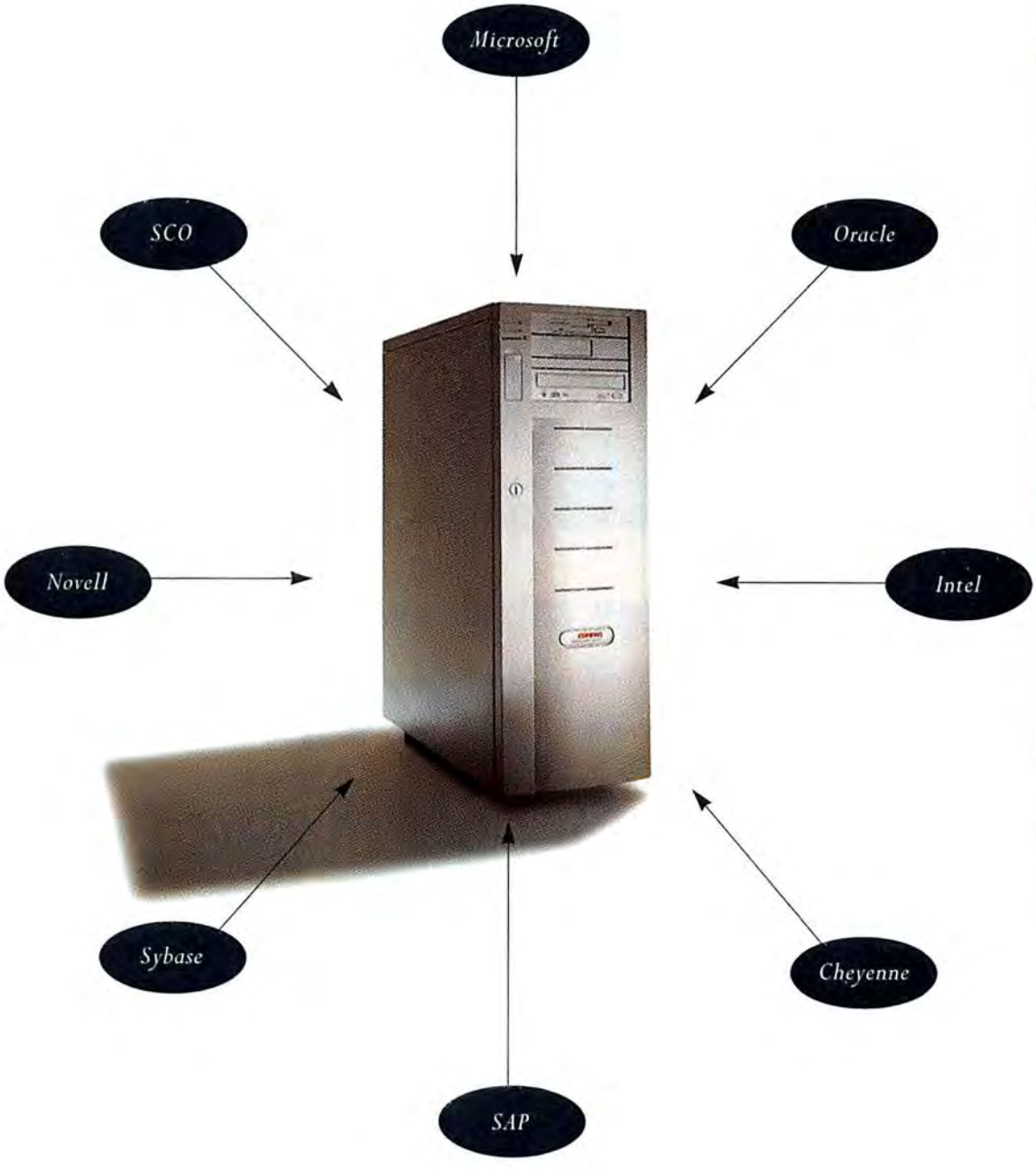

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SPREADSHEETS Q&A

Multigraph Charts in Excel

Q My company uses Harvard Graphics to present summaries of our research budget and spending at monthly staff meetings. The presentations often include one page with two charts: a pie chart showing the portion of total research dollars spent and unspent, and a column chart with a monthly breakdown of spending. I want to reproduce these on one Excel chart sheet, but I can't figure out how to get more than one chart on a sheet.

Susan Lindquist, Chicago

A One approach is to create a column chart on the worksheet along with the data, create a pie chart on the chart sheet, then use the Camera tool to place an image of the column chart on the same sheet as the pie chart. To see how this works, follow the steps outlined below and illustrated in **FIGURE 1**.

1. In a blank worksheet, enter the data in range A1:B13, the labels in C1:C3, and the Approved value in cell D1. Enter the formula **=sum(B2:B13)** in cell D2 and **=D1-D2** in cell D3.

2. Select A1:B13, and click the *ChartWizard* tool to create a column chart on the worksheet. In step 3 of the ChartWizard, choose chart 1 in the dialog box. In step 5, select *No* at the 'Add a Legend?' prompt, and enter **Spending by Month** in the Chart Title box.

3. To exclude August through December from the chart, hide rows 9 through 13: Select A9:A13, then select *Format•Row•Hide*. As the year progresses, unhide the rows one at a time to enter data; the chart will automatically incorporate the new values.

4. Decrease the width between the graph columns by double-clicking the gray area inside the graph, then selecting *Format•Column Group*, clicking the *Options* tab, and decreasing the width to around 50 percent. To turn off grid lines, select *Tools•Options*, and on the View page, deselect *Gridlines*.

5. Select C2:D3, select *Insert•Chart•As New Sheet*, and follow the ChartWizard's prompts to create a 3-D pie chart on a new chart sheet. In step 3, choose chart 7. In step 5, enter **1996 Funds** in the Chart Title box. Click just outside the chart to select its plot area, then drag a corner selection handle to shrink the pie into the top left corner of the sheet.

6. Next, find the Camera tool: Select *View•Toolbars* and click the *Customize* button. Choose *Utility* in the list of categories, find the Camera, and drag it onto the worksheet. Click *Close*.

7. Select the cells underneath the column chart in the worksheet. (The Camera tool only takes snapshots of ranges, not objects like charts.) Click the *Camera* tool, go to the chart sheet, and click where you want the column chart to appear. To resize the picture after you've dropped it onto the chart sheet, click it and then drag its selection handles. To add an outline or drop shadow, use the Format•Selected Object command. Use the *Filled Freeform* tool on the Drawing toolbar to connect the two charts.

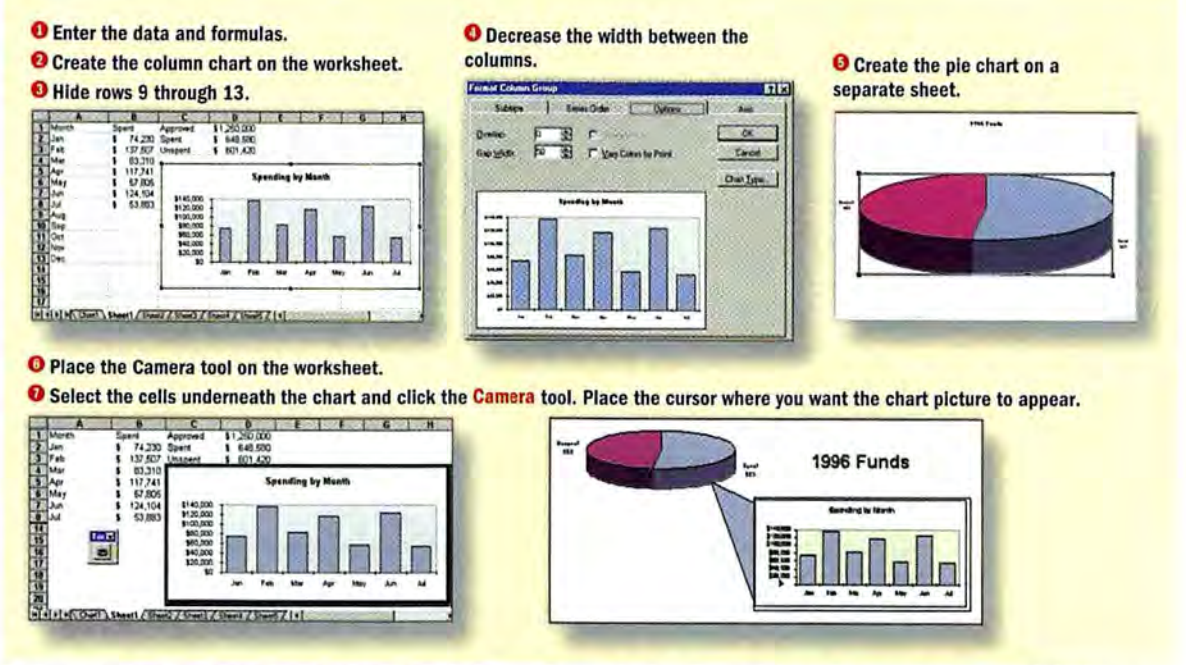

FIGURE 1: TO GET TWO EXCEL CHARTS ON ONE SHEET, create one chart on the worksheet, then create the second chart on a chart sheet. Use the Camera tool to take a picture of the worksheet chart and paste it onto the chart sheet.

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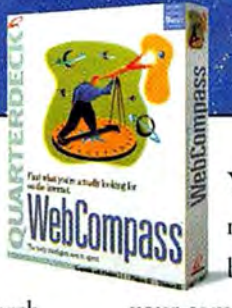

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Circle 189 on reader service card

Adding an Average Line to Excel Charts

Q I created a set of column graphs in Excel using the Insert•Chart•As New Sheet command. Now I need to add a line to each chart showing the average of all the values. Can I do this without re-creating every chart?
Ann Pickel, Dubuque, Iowa

A Yes, you just add the averages to your worksheet data, paste them into the chart, where they appear as additional columns, then change those new columns to a line. Let's say your original data is in range A2:C13. Calculate the average, and copy it into range D2:D13, as in the top part of **FIGURE 2.**

Now, select range D2:D13, and choose *Edit•Copy*. Click inside the chart, or go to your chart sheet and select *Edit•Paste*. You'll get a new set of columns for the new data. To change the columns into a line for the average, click on one of the new columns to select the series, then select *Format•Chart Type*, select the *Line* chart, and click *OK*. Your chart should now look like the one in Figure 2.

In-Cell Formatting in 1-2-3 for Windows

Q I hate it when a program upgrade won't let me do what I could do in an older version. Back when I used 1-2-3 release 3.1, I could italicize or underline a single word inside a label. Now, in 1-2-3 for Windows, I can apply formatting only to the entire cell. This really fries my socks!
Susan Fuhr, Edmonton, Alberta, Canada

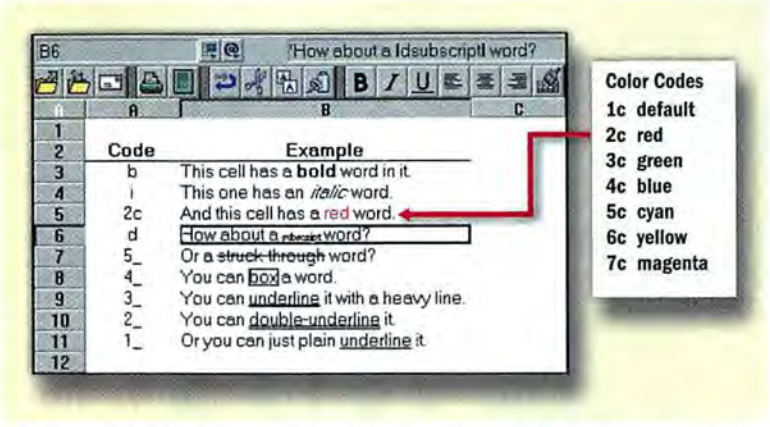


FIGURE 3: WYSIWYG FORMATTING CODES let you apply attributes to specific words in a 1-2-3 for Windows cell. The program normally applies formatting to entire cells.

A Although you can't perform all the tricks you could with the Wysiwyg add-in (which is available only for releases 2.3, 2.4, 3.1, 3.1+, and 3.4), the following undocumented trick lets you do the same kind of formatting in the Windows versions of 1-2-3.

Wysiwyg uses special keystrokes and code letters to apply in-cell formatting. While the keystrokes don't work in Windows, some control codes do.

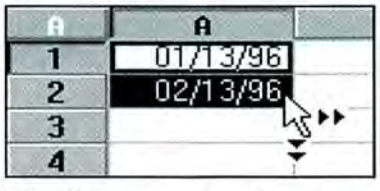
Suppose you want the word *bold* to be bold in a label. Double-click the cell that contains the label, click the insertion point in front of the *b*, press **<Alt>-<F1>**, type **ba** (for begin attribute), and type **b**. Just after the *d*, press **<Alt>-<F1>**, and type **ea** (for end attribute). When you press **<Enter>**, only the word *bold* will show up in boldface. You can also enter these codes as you type the text.

FIGURE 3 shows this and other codes you can use. Enjoy!

Incremental Dates in 1-2-3

Q I track client billing in 1-2-3 release 5.0. Client A might receive a bill on the 13th of every month; client B on the 17th, and so on. I have one sheet per client, and I want to create a list of the billing dates for each client. Can I create formulas to calculate the dates?
Genifer Caldecott, Hartford, Connecticut

A You could use 1-2-3's Fill feature to do this. For example, enter **01/13/96** into cell A1 and **02/13/96** into cell A2, select A1..A2, move the cursor to the bottom right corner of the selection until you see double arrows, as in the figure, and drag down the column.



But if you want to be able to change the initial date and have the series recalculate, you need formulas. In that case, enter your first date into cell A1, then enter **+A1+31+@day(A1)-@day(A1+31)** in cell A2 and copy it down column A.

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.*

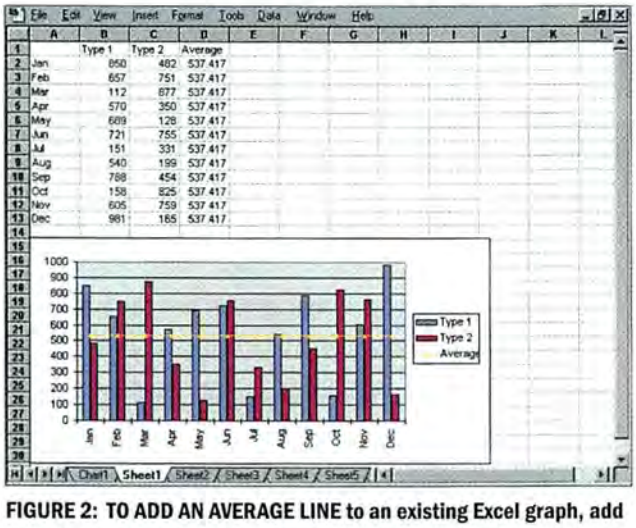


FIGURE 2: TO ADD AN AVERAGE LINE to an existing Excel graph, add the data to the worksheet (column D here). Then select the new series of columns and change their chart type to Line.

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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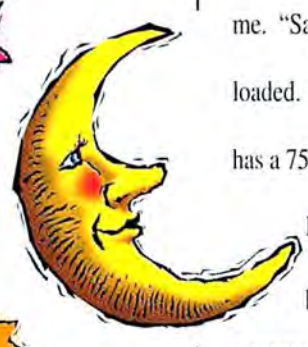
S O L O

Man, I love this machine!

There I was. Miles from anywhere, just working away. Thinking — *man, I love this machine!* Everything I need, right at my fingertips. A powerful 120MHz Intel® Pentium® processor, active matrix SVGA color display, 16MB RAM, whopping 1.2GB hard drive, and CD-ROM drive — it's high-end desktop power in a portable PC.



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, places.

"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 surpressed the urge to ask the Desert Queen about the secrets she was keeping from the world.

Gateway Solo models feature two integrated stereo speakers.

"Honey, the folks at Gateway 2000 are just great. Can you believe that each system gets 24-hour, seven-day-a-week telephone technical support? And their values just can't be beat," said Delilah with a far off look in her eyes. I had a feeling my adventures were just beginning.

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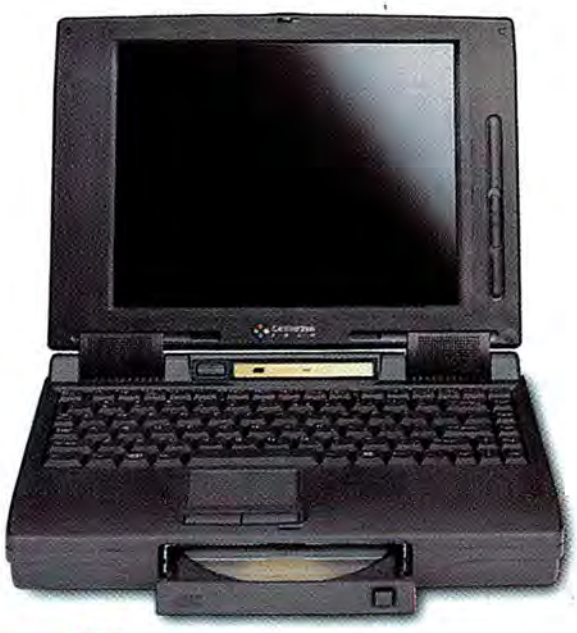

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WORD PROCESSING Q&A

Add Page Borders in Word 6.0

Q I need to create borders around pages in Microsoft Word 6.0 for Windows. I've been using the drawing tools and even text boxes to manually frame each page, but that quickly gets tedious. Is there an easier way?
Emilia Threlkeld,
Walnut Creek, California

A Yes, there is, but it's not as easy as adding page borders in WordPerfect and Ami Pro. In Word, you create the border as a watermark and put it in a header so it appears on every page. It's a six-step process, shown in **FIGURE 1** and outlined as follows:

1. Open a new, blank document, select *View•Page Layout*, select *View•Zoom*, click the *Whole Page* radio button, and click *OK*.

2. To make the margins visible on the page so you can see where you want to place the page border, select *Tools•Options•View* and check the *Text Boundaries* option.

3. Display the Header and Footer toolbar to open the frame you'll draw the border in: Select *View•Header and Footer*; then drag the toolbar out of the way of your document.

4. Display the Drawing toolbar: Select *View•Toolbars*, click the *Drawing* check box, then click *OK*. Click the *Rectangle* button, then click and drag your border directly onto the visible page in your document. Adjust the size as necessary, and be careful to keep the border outside of the visible margins on the page to avoid conflicts with your text.

5. At this point, you can use several drawing tools to alter your border. To change the line size and type, click the *Line Style* button. To change the color of the line, click the *Line Color* button. To change the background fill, click the *Fill Color* button. If you want more options for style, color, and fill, click the word *More* in the Line Style pop-up box to access the Drawing Object dialog box.

6. Click the *Send Behind Text* button on the Drawing toolbar to put the border in the background of your document. Then click the *Close* button on the Header and Footer toolbar and select *Normal* from the *View* menu to return to editing mode.

If you plan to use this border format in other WinWord documents, select *File•Save As*, choose *Document Template* from the Save File as Type list, name the template file **borders.dot**, then click *OK*. From then on, you'll be able to load your new template with the File•New command.

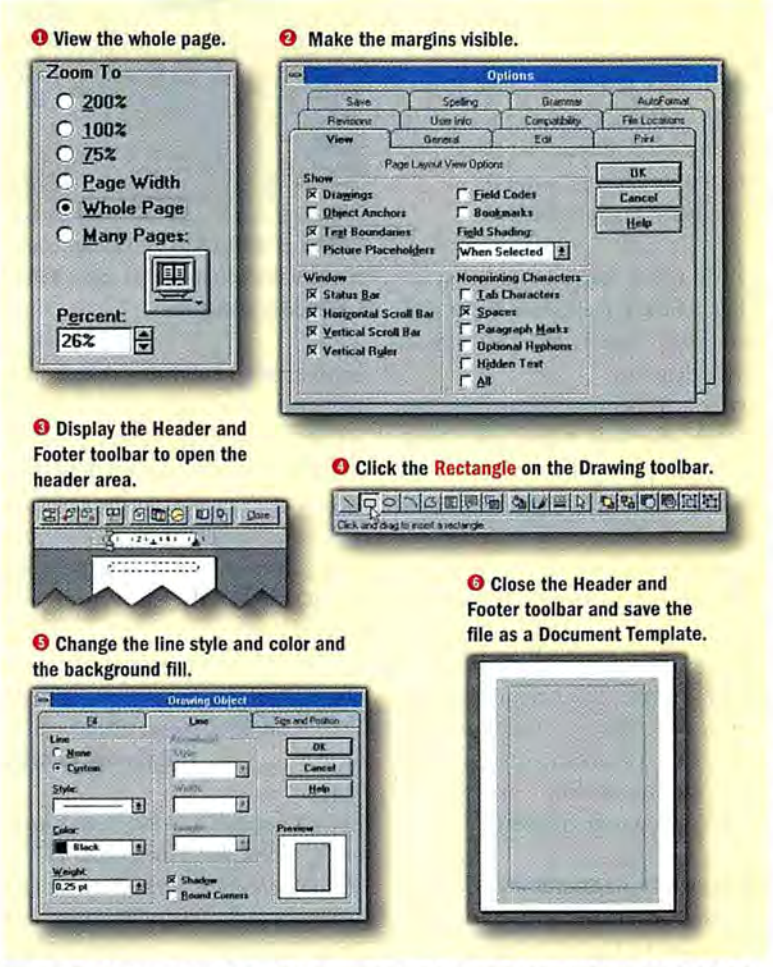

FIGURE 1: ADDING PAGE BORDERS in WinWord 6.0 isn't easy, but you can create a document template to avoid repeating the process.

Slowing Down Highlighting in WinWord

Q Whenever I use the mouse to highlight large amounts of text in Word 6.0 for Windows on my 90-MHz Pentium, an alarming thing happens. As soon as my highlighting extends beyond the current screen, the program shifts into overdrive and begins highlighting at supersonic speeds. When I try to back up, it shifts into high speed in reverse and is impossible to control.

Is there anything I can do to slow this highlighting down to more manageable speeds?
Ben Dingel, West Lafayette, Indiana

WinWord Keystrokes Highlight

<Shift>-<Right>	One character at a time
<Ctrl>-<Shift>-<Right>	One word at a time
<Shift>-<Down>	One line at a time
<Ctrl>-<Shift>-<Down>	One paragraph at a time
<Ctrl>-<Shift>-<End>	The entire document

A You've accidentally discovered one of WinWord's great features. When you're highlighting text with the mouse and drag below the edge of the document screen, highlighting continues while the document scrolls. The farther below the document window you hold the mouse pointer, the faster the selection and highlighting proceeds.

One way to slow down is to move the mouse to a position *just* below the actual document window as you select text. To stop selecting, simply move the mouse pointer back inside the document window.

Another approach is to select *View•Page Layout*. Text scrolls more slowly in that mode than in Normal mode.

For even slower highlighting and scrolling, try using the above keyboard combinations instead of the mouse.

Print Odd or Even Pages in WordPerfect 6.1

Q I just switched from WordPerfect 6.0 for DOS to version 6.1 for Windows. I like the new program, but I can't figure out how to print just the odd or even pages of a document as I did in DOS. What's the trick?
Alice Brown, Cleveland

A Well, it's easy, but the commands aren't located in the same place in the Windows version. To print just the odd or even pages, select *File•Print•Options*, then click and hold the *Print Odd/Even Pages* button and drag to select the option you want, as pictured below. Click *OK*, then click *Print*.

Page Number Problem in WordPerfect 6.1

Q In long WordPerfect 6.1 documents, I've noticed that clicking on the next page or previous page buttons at the bottom of the scroll bar changes the page displayed on the screen, but not the page number in the status bar. The same thing happens if I use the scroll bar itself. If I click anywhere on the new page, though, the number is updated.

This is confusing when I'm trying to scroll to a new page in the document, since I can't tell which page is displayed. Is there a way to move from page to page and have the status line show the correct page number?
Karen Albertson, Los Angeles

A I had never noticed that behavior, but when I looked at Word and Ami Pro, I found that they didn't behave that way.

As you recognized, the status line indicates the page where the cursor is, not the page on the screen, and scrolling a document with the scroll bars or page buttons doesn't move the cursor to the new page.

The fix is easy, though. Instead of using the scroll bar or buttons to scroll page by page, press **<Alt>-<Page Up>** or **<Alt>-<Page Down>**. The keystrokes move the cursor to the top of the previous page or to the top of the next page, respectively. Because the cursor moves, WordPerfect updates the status line.

Editing Ami Pro 3.1 SmartIcons

Q I'd like to edit the actual images on some of the SmartIcons in Ami Pro 3.1 to suit my taste. How can I do this?
Brian White, Tampa, Florida

A You can't edit every icon on the SmartIcon bar. Some are hard-coded in the application, but many of the icons are custom icons, stored as .bmp files in the amipro\icons directory. Here are the steps to edit the custom Ami Pro 3.1 SmartIcons:

1. Select *Tools•SmartIcons*, and click the *Edit Icon* button in the SmartIcons dialog box.

2. In the *Available icons* list of the Edit SmartIcon dialog box (**FIGURE 2**), click the icon you wish to edit to load it into the editing window. If you try to edit a hard-coded icon, you'll get a message warning you that you can't edit a standard Ami Pro icon. You can, however, create a new icon based on a standard icon. Just save the standard

FIGURE 2: MOST AMI PRO SmartIcons can be edited pixel-by-pixel in the Edit SmartIcons dialog box.

icon under a new name, then edit as described in the next step.

3. In the editing window you can edit the icon pixel-by-pixel. First click on one of the colors in the color bar under the window, then draw directly on the icon. You can add more colors by clicking the drop-down arrow on the color bar.

4. When you're satisfied with your artwork, click *OK* to save your changes. Or click *Cancel* to return to the original.

By George Campbell

George Campbell is a contributing editor for PC World *and a contributor to* The PC Bible *(Peachpit Press, Berkeley, California, 1994). Word Processing welcomes your questions and pays $50 for published items. See page 12 for contact information.*

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WINDOWS Q&A

Remote Printing Simplified

Q I use Word for Windows at home to draft papers for school and would like to print them out on the school's printers. The problem is that the school's computers are loaded with WordPerfect for Windows. Converting my files is time-consuming and not completely effective. I discovered from Print Manager Help that I can print documents to a .prn file and then print from that file. This helped me make the .prn file, but I'm not sure how to get the file printed after I take the disk to school.

Shawn Traudt, Lawrence, Kansas

A The DOS copy command is probably the easiest way to send your print file to the printer at your school. And with a batch file, you can make the process even easier, whether your school uses Windows 3.1, Windows for Workgroups, or Windows 95. (For a review on how to make a print file in the first place, see "P.S. I Print You" in the November *Windows* column—disregard the steps for installing a PostScript printer driver unless you'll be using a PostScript printer).

First, on the computer at your school, use Notepad to make a batch file that contains the following command:

copy /b %1 lpt1:

If the printer is connected to a port other than LPT1, you'll have to change the last item accordingly. And if your school uses Windows 95, you'll need to add a second line, **cls**, so the batch file window will close automatically. (Be sure there are no carriage returns in the batch file after the 'cls'—not even one right after the 'cls', which some text editors add automatically.) Name the batch file **printme.bat**.

Next, associate the .prn extension to this batch file. In Windows 3.x, select the print file in File Manager and choose *File•Associate*. Type the full path and name of your batch file (such as **c:\windows\printme.bat**) and press **<Enter>**. Then use the Windows PIF Editor to make a program information file for your batch file: For Program Filename, type the path and name of your batch file. Check *Close Window on Exit* to make the DOS window go away when the batch file is finished. Then save your PIF in the Windows directory with the same name as your batch file except for the extension—for example, **printme.pif**.

In Windows 95, select the .prn file and press **<Shift>-<F10>**. Choose *Open With* from the pop-up menu. Check *Always use this program to open this type of file*. Next, click the *Other* button and type in the path and name of your batch file. Then click *Open* and *OK*.

That's it. Now, whenever you bring a .prn file from home, you can just double-click on it in File Manager or Explorer and wait for the results to emerge from the printer.

Keying In on Files in Windows 95

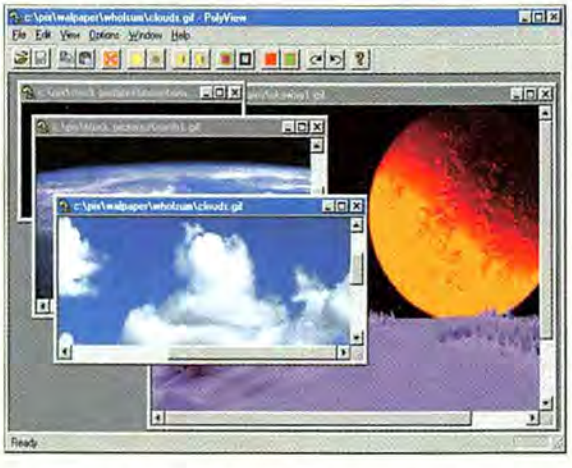
Q I find it's quicker to use the keyboard rather than the mouse for most of my work. The File dialog boxes in Windows 95 add great new abilities, but they really slow me down. I'm used to dialog boxes that I can open with a keyboard shortcut, and that let me start digging through file and directory lists by pressing <Tab>. But in Windows 95, the dialog box opens with the cursor in the file name box instead of in the file and folder list. That's fine if I want to type a long file name or path—not! To get to the file list, I have to press <Tab> five times! Isn't there a way to change the default cursor location?

Chris White, Boothbay, Maine

A You could press <Alt>-I and then <Tab> in each file dialog box to get to the File list, but that's still a bit cumbersome. Here's a work-around created in the old Windows Recorder.

Since you apparently upgraded from a previous version of Windows, you may still have Recorder on your computer. If not, find recorder.ex_ on your

Windows Toolbox: Seeing Images



Sure, you installed Windows 95's Quick View file viewer, but that's no help for all your existing graphics files. Into the breach rushes PolyView, a 32-bit application for Windows 95 and Windows NT. In addition to letting you view BMP, GIF, JPEG, TIFF, and Kodak Photo CD files, PolyView performs simple manipulations on these images, including adjustments for hue, saturation, brightness, and contrast. But its real power comes from its slide-show mode, which lets you create a list of image files and display them one after another on your screen either manually or automatically. The current version only lets you save in JPEG and BMP formats, but more export options are promised. PolyView is a $20 shareware program from Polybytes at 3427 Beaver Ave. SE, Cedar Rapids, IA 52403 or PolyView@kagi.com. Download polyv213.zip on PC World Online.

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*VDSS = Viewable Diagonal Screen Size

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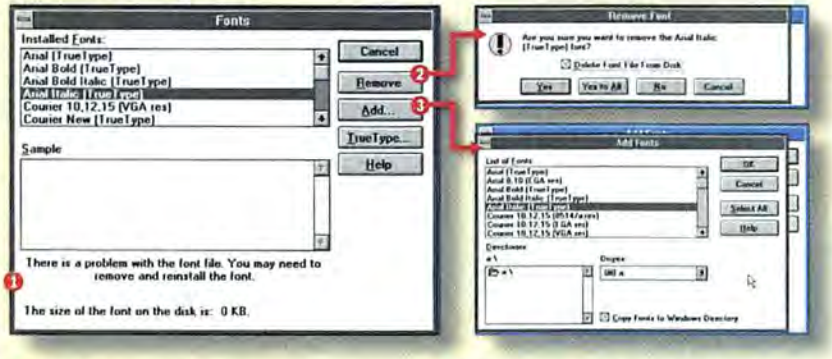
Fix Your Failing Fonts



❸ Identify corrupted fonts from the status message. ❷ Click Remove to delete the problem font. Be sure to delete the file from your hard drive. ❸ Click Add. With the Windows or other font installation disk in the proper drive, select the font to install, and click OK.

Windows 3.*x* floppies. Then open a DOS window, type **expand**, and follow the prompts on screen.

Start Recorder, then start a program that uses the Windows 95 file dialog boxes; this sets the stage for your recording. Press **<Alt>-<Tab>** to switch back to Recorder, and choose *Macro•Record*. Give your macro a name and assign it a shortcut key. The keys you choose will supersede matching keystrokes in all other applications when your macro file is running. In this case, **<Ctrl>-0** is a good choice since many programs already use it to open the File Open dialog box and you won't have to worry about preempting those keys in those applications. Type **0** and click the *<Ctrl>* check box.

Set Playback to *Any Application* and set Speed to *Fast*. For Record Mouse, select *Ignore Mouse*. Make sure *Enable Shortcut Keys* is checked. Click *Start*.

If you set up everything properly, your application should now be active. Press **<Alt>-F**, then **O** to open the File•Open dialog box. Press **<Alt>-I** and then **<Tab>** to move the cursor to the file and folder list. Click the *Recorder* icon on the taskbar. Make sure that *Save macro* is selected, and then click *OK*. In Recorder, choose *File•Save* to save the macro to a file.

To make sure that your macro is always available, right-click the *Start* button and choose *Open* or *Explore* and navigate to the Startup folder in the Programs folder. Then use My Computer or Explorer to open another file window and locate the Recorder .rec file in which you saved your macro. If necessary, position the windows so that you can see the Startup folder and the .rec file icon at the same time. Now use the right mouse button to drag the .rec file to the Startup folder window. Choose *Create Shortcut(s) Here* from the pop-up menu.

Select the new shortcut, and press **<Alt>-<Enter>** to open its properties sheet. Press **<Ctrl>-<Tab>** to display the Shortcut tab. Choose *Minimized* from the Run list to make sure Recorder starts as an unobtrusive icon on the taskbar when you turn on your PC.

Now whenever you want to see a File Open dialog box, press **<Ctrl>-0**. Then you can cursor to the folders and files you want.

Even though this macro was designed for Windows 95 dialog boxes, it should work adequately with any Windows application that uses the normal Open command on a File menu. You can make a similar macro to open the File•Save As dialog box as well.

Finding Faulty Fonts

Q I have used Windows for Workgroups 3.11 for a year with no problems. But now when I start some applications, I get an annoying message: 'Invalid TrueType Font Detected. An application used a TrueType font that caused an error in Windows. Quit all applications, and then restart Windows'. When this happens I must quickly save my work and restart Windows because I can't read anything I type. How can I solve this problem? I have a lot of TrueType fonts and don't know which one is causing this.

Trias Hermann, Internet

A As you surmised, the solution is to replace the corrupted font. But how do you find it? Fortunately, this is easy, though not obvious, as shown in the figure at left.

Start Control Panel and double-click the *Fonts* icon. Select each font and look at the line at the bottom of the dialog box that reports the size of the font on the disk. Any font that's listed as 0KB or 2KB is probably corrupted. You'll be prompted with a message that states 'You may need to remove and reinstall the font'.

With the bad font selected, click *Remove*. When prompted, check the *Delete Font File From Disk* option and then click *Yes*.

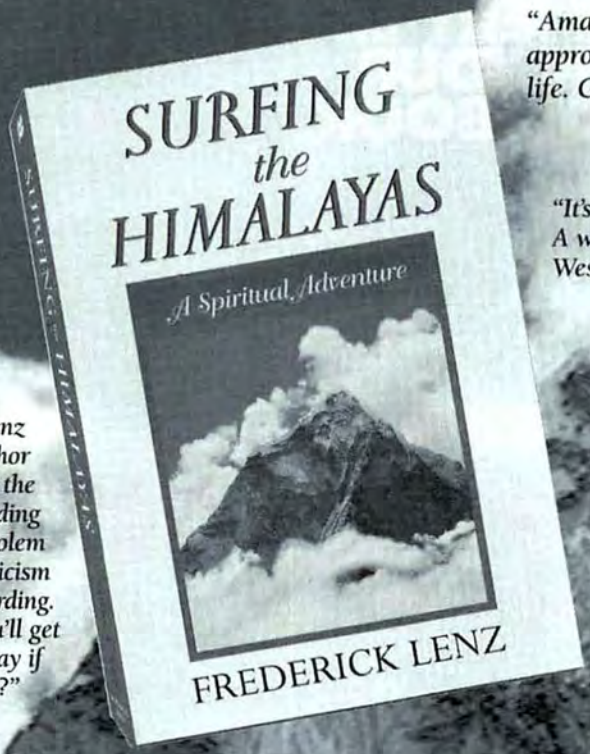
Once the corrupted font is gone, the next step is to restore it from your original Windows disks (or from a third-party font package).

Click *Add* in the Fonts dialog box, and insert one of the disks in your floppy drive. Select that drive to see a list of the fonts on the disk. If the disk you inserted doesn't have the font you want, insert another and double-click the drive letter in the Directories list to refresh the fonts list. When you find the font you want, select it and then click *OK*.

By Scott Dunn

PC WORLD online *The files mentioned in this article are available on PC World Online. Scott Dunn is a contributing editor for* PC World *and a principal author of* The PC Bible, 2nd Edition *(Peachpit Press, 1995, 800/283-9444). Windows welcomes your questions and pays $50 for published items. See page 12 for contact information.*

From Surfing the Internet to...
"Surfing the Himalayas"
by Frederick Lenz



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Chris Sanders,
President, Avalanche
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Photo: Greg Gorman

Dr. Frederick Lenz is not only a consultant to major software firms, he is also a world-class snowboarder, and a black belt in the martial arts. In addition to these skills, he is a talented musician and record producer. Combining his passion for snowboarding with his desire to tell a good story, Lenz wrote the novel *"Surfing the Himalayas:* A Spiritual Adventure" based on his own experiences in Nepal.
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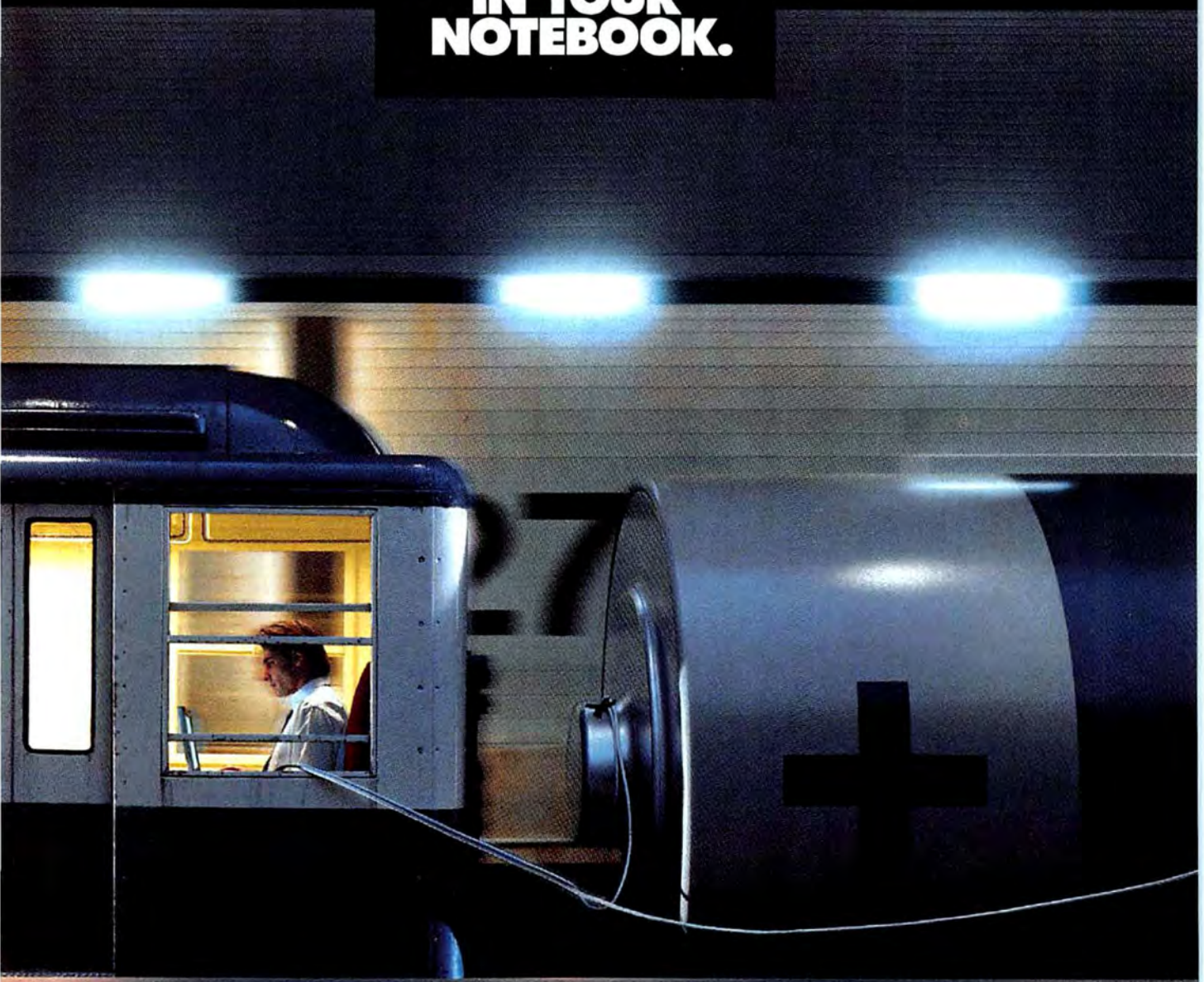

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DATA MANAGEMENT Q&A

Creating a Relational Database in Access

Q Microsoft Office includes the relational database Access. What makes a database relational? Is it better than a spreadsheet database?

Susan Johansson, Madison, Wisconsin

A Spreadsheet databases are fine for mailing lists or lists of expenses—data representing one category of information that can be kept in one file.

But a more complicated project, such as an order entry/invoicing system with several categories of data, is best kept in a *relational* database, where each type of data (orders, customers, stock data) is stored in its own file, then linked to other files for entering orders and printing invoices.

This is much more efficient than a *flat-file* database. If order entry/invoicing were kept in a basic worksheet, then each time a customer placed an order, all details about the customer (name, address, phone) and the items ordered (stock number, description, price) would have to be reentered.

In a relational database, you enter data once, in its own table. But how do you divide data into tables and join the tables together in a form or report? I'll give you an overview by creating an order entry/inventory system in Access.

The form in **FIGURE 1** includes data from the four tables in **FIGURE 2**. Before you begin, you need to create these tables, making the key field 'Order #' in the Orders table; 'Order #' and 'Line #' in Order Lines; 'Customer #' in Customers; and 'Stock #' in Products. Key fields identify each record as unique.

Each table shares a field with at least one other table. Common fields are the bases for *joins*, which tell Access what customer data and line items to show.

In Access you join tables and then create queries that can be used as the bases for a multitable form. Here's how:

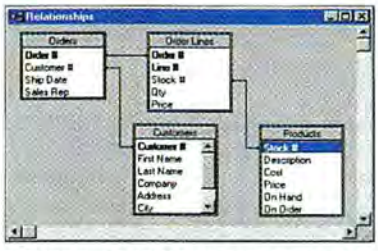

FIGURE 2: TO JOIN TWO TABLES, drag the mouse between their common fields.

1. Choose *Edit•Relationships*. In the Add Table dialog box, double-click *Orders*, *Order Lines*, *Customers*, and *Products* in turn. Then close the dialog box.

2. In the Relationships window, drag between the 'Order #' fields in Orders and Order Lines to join these tables. Join Orders and Customers on the 'Customer #' field, and Order Lines and Products on the 'Stock #' field. Close and click *Yes* to save.

3. Click the *Query* tab in the Database window and click *New*. Click *New Query*, double-click *Orders* and *Customers* in the Add Table dialog box, and click *Close*. Drag the asterisk in the Orders list to the query grid. Drag each Customers field that you want on the order form into its own column on the grid, as shown in **FIGURE 3**. Save the query as **Order Form.**

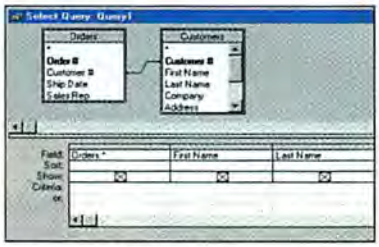

FIGURE 3: ADD FIELDS to a query grid by dragging them from a table at top.

4. Create another query that includes the Order Lines and Products tables. Drag the asterisk for Order Lines into the query grid, along with the Price and Description fields from Products. Save this query as **Order Form Line Items.**

5. Click *Form* and *New* in the Database window, select *Order Form* as the table to query, and click *Form Wizards*. In the dialog box, select *Main/Subform*. In the next dialog box, click *Queries* and double-click *Order Form Line Items*. For the main part of the form, include the fields you want from Orders; for the subform, include all the fields from the Order Form Line Items query except 'Order #'. In the next dialog box, select *Orders* as the table with the joining field. Choose a form style, then open the form in Design mode. Enter a subform name at this point.

6. Click *OK* if Access says it can't link the main form and subforms. In the Design window, right-click the subform area and choose *Properties*. Type **Order #** after Link Child Fields and Link Master Fields, then save the form.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World *and 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.*

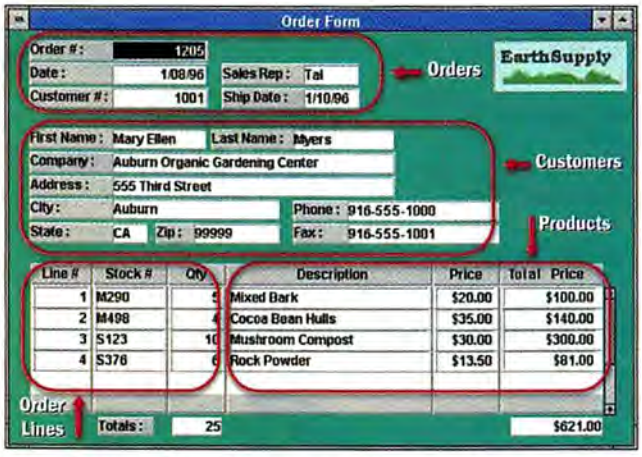

FIGURE 1: DATA IN THIS FORM is from tables joined by common fields.

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PRESENTATIONS Q&A

Play It Again, Harvard

Q I added a sound file (with background music) in a Harvard Graphics 3.0 for Windows presentation, but when I play the screen show, there's no sound at all.

I can play the same sound file in other programs, but not in Harvard. What gives?

Darlene Riggles, PC World Online

A Whether it's reggae background music, cordial greetings from the CEO, or the sound of bubbling champagne for a celebration, you can easily add sound to your Harvard Graphics screen shows, using both .wav and MIDI sound files.

If you're having trouble, the usual suspect is an unchecked 'Enable sound' option, buried at the bottom of the Edit ScreenShow dialog box.

Following are the key steps to get the Harvard band playing for you whenever you want:

With your Harvard presentation open, either select *Slide•Edit ScreenShow effects* or click the *Screen Show* icon to open the Edit ScreenShow Effects dialog box.

At the bottom of the dialog box, mark the *Enable sound* check box, which is essentially a master switch that turns the sound option on or off for the entire presentation. Remember: You have to turn this option on in all of the Harvard presentations that play sound files.

For more information about adding sound to your presentations, see the figure below.

Add Custom Templates to PowerPoint for Windows 95

Q Using Microsoft PowerPoint for Windows 95, I've designed several custom templates for company presentations. Is it possible to add my templates to the existing library of choices that PowerPoint provides when I select Format•Apply Design Template? A one-stop location would make it easier for my colleagues to find and use all the available templates.

Jennifer Anderson, Richmond, Virginia

A It's easy to add custom templates to PowerPoint's own library of designs, as long as you store all of the templates in the *same* folder.

By default, PowerPoint stores its own templates in its Presentation Designs folder. Here's how you can store your templates there, too.

After you finish creating your own custom design for a presentation, select *File•Save As* to open the File Save dialog box.

Then, select *Presentation Templates (*.pot)* for the Save As type option, select the *Presentation Designs* folder for the Save In option, give your file a name in the File Name option, and click *Save*.

From now on, your custom templates will appear as regular choices in the same Apply Design Template dialog box as PowerPoint's own templates. And that should let you and your coworkers find all the available presentation templates without having to dig through any additional layers of folders.

By Richard Jantz

Contributing Editor Richard Jantz is an electronic publishing and presentations consultant in Kensington, California. Presentations *welcomes your questions and pays $50 for published items. See page 12 for contact information.*

Listen to the Music—Harvard Style

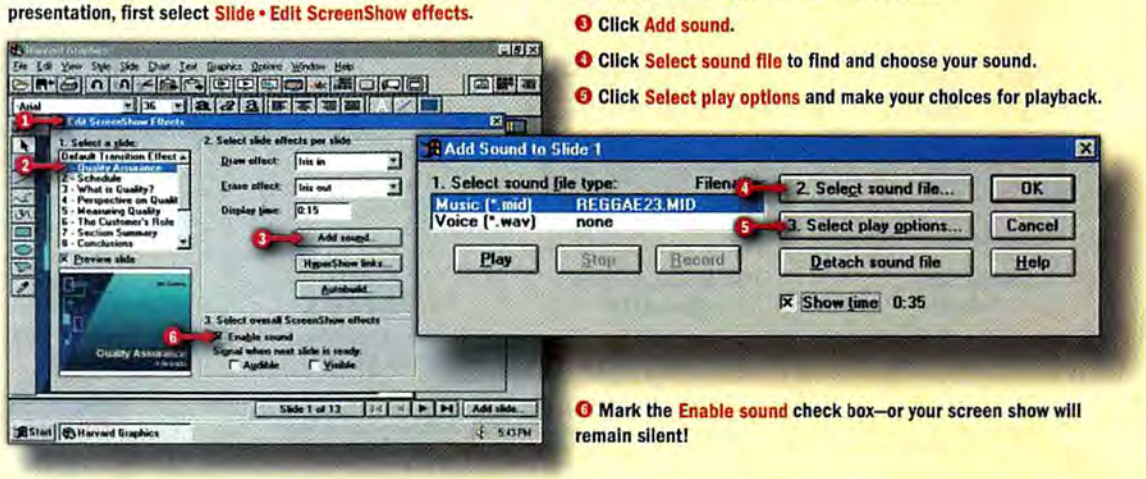
❶ To add and manage sound within a Harvard Graphics presentation, first select Slide • Edit ScreenShow effects.

❷ Select the slide you want to add sound to.

❸ Click Add sound.

❹ Click Select sound file to find and choose your sound.

❺ Click Select play options and make your choices for playback.



❻ Mark the Enable sound check box—or your screen show will remain silent!

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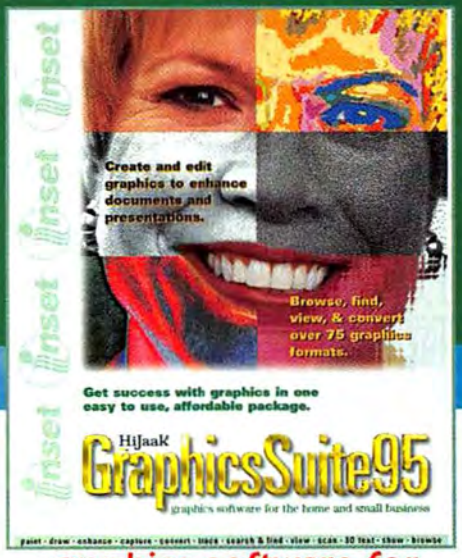

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ONLINE Q&A

An Internet Refuge From War

Q The war in my country and the siege of Sarajevo have left us almost totally isolated from the outside world. Most of our lines of communication—postal service, international telephone lines, and so on—have been cut off. The only open channel in Sarajevo is a local electronic bulletin board service, but because that has only one telephone line and because power shortages are frequent, we are still left in the dark much of the time.

Most of the nearly 500 BBS members are also registered on another BBS in the city of Tuzla, which is in free territory. And with the help of French students, we've established a European Club, where we can read, with more or less delay, the foreign press—including your magazine.

Our problem is that our BBS does not give us full access to the Internet, only Internet e-mail. We have found ways to retrieve documents from the World Wide Web, but there have been problems. Can you tell us how to retrieve more information from the Internet, using e-mail only?

Tarik Dreca,
Sarajevo, Bosnia-Herzegovina

A As you are discovering, you can obtain just about anything you want from the Internet, even if all you have is an e-mail address. And that address can be located anywhere, from a simple bulletin board to an office network.

Just by sending messages to computers on the Internet, you can conduct searches of anything, from Usenet newsgroups to FTP sites, and the computers will send you back e-mail messages that contain the information you want, including text from World Wide Web home pages. The only things that you can't get this way are the Web's beautiful graphics.

As a matter of fact, I often prefer getting information off the Internet via e-mail; I just send a message with a few commands in it, and the information is in my mailbox in hours, or even minutes. It's usually easier than tapping my way around the Internet.

To get started, send a message to mailbase@mailbase.ac.uk to retrieve a copy of Dr. Bob Rankin's wonderful tutorial on surfing the Net by e-mail. The message should contain only the following line:

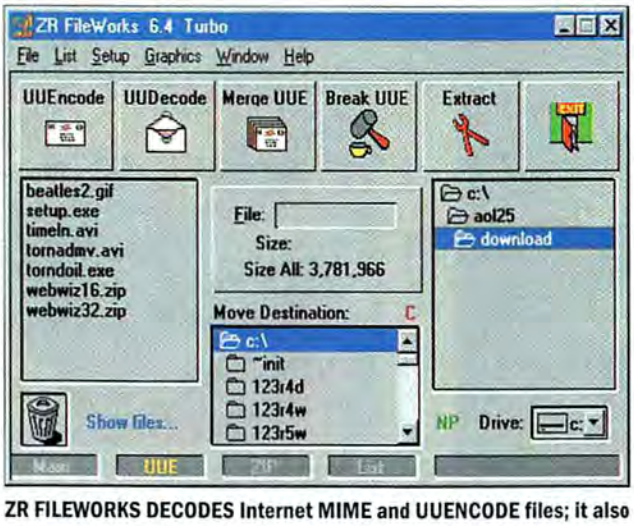
send lis-iis e-access-inet.txt

Readers in the United States can send a message to listserv@ubvm.cc.buffalo.edu. Your message should contain the following line:

get internet by-email net-train f=mail

The Net tutorial is available in more than a dozen different languages, including Russian and Romanian. To get a translation, send an e-mail message to BobRankin@mhv.net. (Unfortunately, the tutorial is not available in Serbo-Croatian.)

And good luck!



ZR FILEWORKS DECODES Internet MIME and UUENCODE files; it also decompresses zipped files, and plays movies and sound files—just about everything but hanging your laundry out to dry.

Learning the Art of MIME?

Q Friends on the Internet have asked if they can send me MIME files. What are these files, and what do I do when I get them?

Ann Bankston, Chicago

A Because the Internet restricts e-mail to ASCII text, you can't use it to send binary files like graphics, word-processing, and program files, which use high-bit formatting. The solution is to turn those files into text before you send them over the Internet. There are several standard ways of doing this, including MIME (which stands for Multipurpose Internet Mail Extensions) and UUENCODE.

When you receive a MIME file, you must decode it before viewing it. You'll find many decoding utilities floating around on the Internet—some are free, some are shareware. My favorite is Scandere Software's ZR FileWorks. This $31 shareware program, shown in the figure at lower left, decodes MIME and UUENCODE files. It also expands files that have been compressed with PKZIP, ARC, ARJ, LZH, and ZOO; it displays graphics files in a variety of formats including GIF, PCX, and JPEG; and it even plays movie CD-ROMs and sound files.

ZR FileWorks is available as zrfw.zip on PC World Online and directly from Scandere Software.

- **ZR FileWorks 6.4 Turbo**, $31; Scandere Software; 508/771-3973; e-mail: jared10@aol.com; Web page: **http://home.aol.com/Jared10**
  Reader service no. 642

Does America Online Charge Users During Freeze-Ups?

Q America Online frequently freezes up on me. All I get is the screen and an hourglass. I can minimize the AOL window and work on other applications, but I can't get AOL to do anything, including hang up. My question

Windows 95 Compatible

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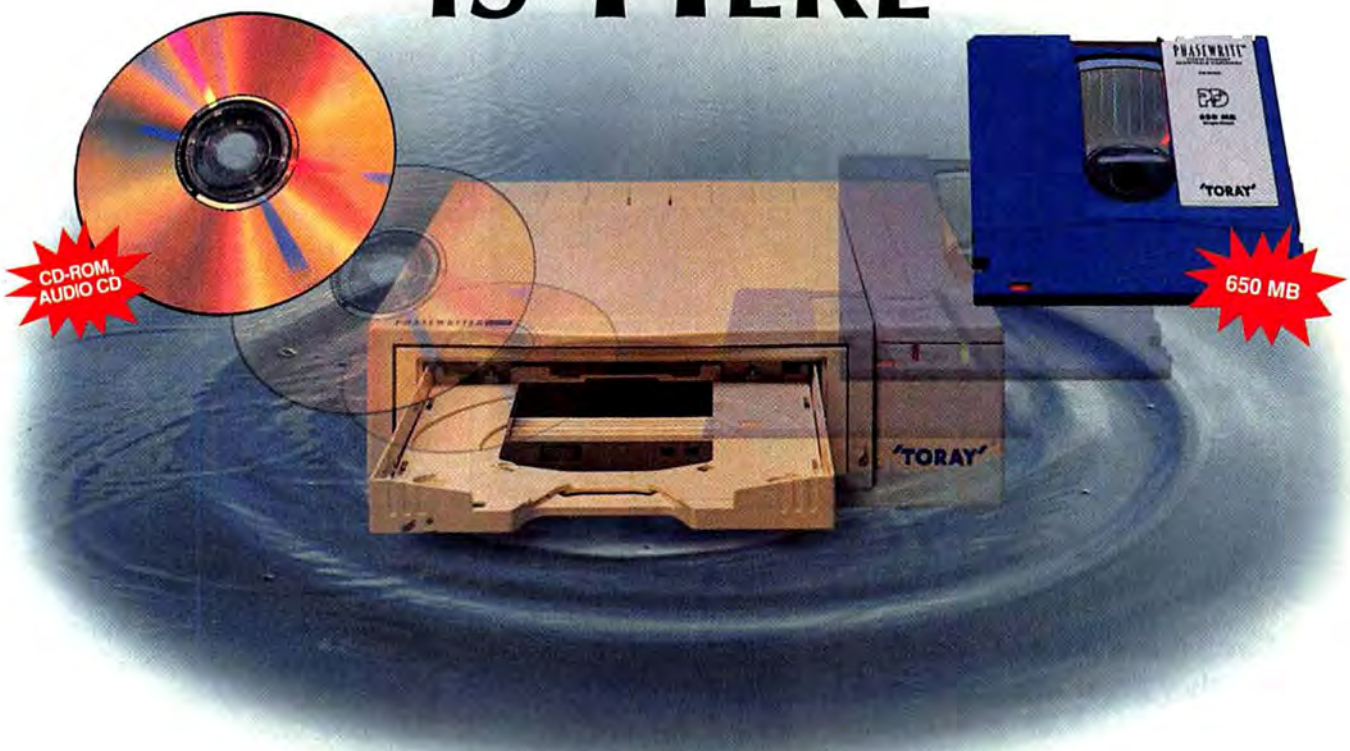

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Circle 227 on reader service card

is this: Is AOL charging me by the minute while its software is locked up?
Lincoln Connors, Natick, Massachusetts

A That depends on the cause—dirty telephone lines, a nonstandard modem, terminate-and-stay-resident programs, a weird video driver, or peculiarities of SprintNet, which you use to contact the service.

AOL sometimes registers "no carrier" when it locks up, and in these cases you're not billed for the lock-up time, according to a help desk specialist at America Online. But to ensure you don't get billed, hang up by turning off the modem or unplugging the phone cord from the jack, then call AOL through a different access number. Often that's enough to cure the problem.

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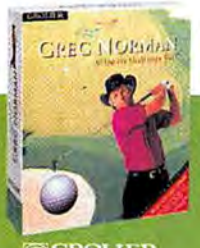

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Circle 99 on reader service card

Quick Tip: Forward Your Faxes

In response to "Getting Winfax to Step Aside" (*Online Q&A*, April 1995), Martin Liss sent in an easy remedy to keep your fax software from interfering with your system's COM ports when you're calling an online service: Simply forward calls on your modem line to the number of a fax machine in your office. "I also do this at night so I can receive faxes without having to leave my PC running or confusing senders with multiple fax numbers," Liss writes.

Internet Pick of the Month: Finding Employment Online

In response to "Job-Related Information on the Net" (*Online Q&A*, August 1995), Mike Page, associate director of career services at the University of Wisconsin, Stevens Point, wrote to recommend Margaret F. Riley's "Employment Opportunities and Job Resources on the Internet," which is available at **http://www.wpi.edu/~mfriley/jobguide.html.** This information treasure-house offers job seekers easy access to everything on the Internet that's employment-related.

Quick Tip: Curing E-Mail Psychosis in WinCIM

If you use the CompuServe Information Manager WinCIM to send and receive e-mail, you may notice it sometimes loses its grip: Windows memory allocation errors pop up, or messages report that some mail doesn't exist. There's a simple cure: Select *Special•Rebuild Cabinet Indexes* from the main menu. WinCIM will then reorganize its e-mail databases. This can take up to ten minutes, depending on how many messages are stored in your in- and out-boxes, but in most cases WinCIM returns to normalcy.

By Judy Heim

PC WORLD online *The files from this article are available via PC World Online. Judy Heim is a contributing editor for* PC World *and author of* 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.*

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HARDWARE Q&A

Shuffling Notebook Cards

Q I'm confused about notebook features. In ads, I see PCMCIA options described as "one Type II or one Type III" or "two Type II or one Type III." Do these options make a lot of difference?

Teddy Cokro, Sunnyside, New York

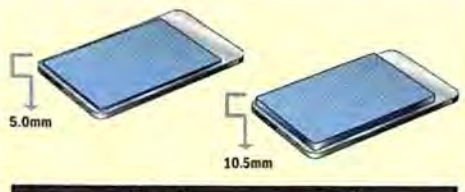
A The industry is trying to retire the cumbersome acronym *PCMCIA* (Personal Computer Memory Card International Association) cards and replace it with the term *PC Cards*, so let's call them that.

But whatever you call these credit card–size devices, just about every notebook today has at least one slot for Type II PC Cards, which are typically fax-modems, LAN adapters, SCSI cards, cellular modems, and so on. Type III slots are for PC Card hard disks and cellular modems (see the figure below).

Now here's the confusing part: A single Type III card is more than twice as tall as a Type II card, but it can accommodate two Type II cards only if it has two connectors. If a Type III slot has a single connector, then it can hold only one card of either type.

Are these cards important? That depends on what you need, of course, and on your notebook's configuration. If your notebook already has an acceptably fast proprietary modem from the manufacturer, then you don't need a PC Card modem, the most common Type II device available. If you buy your notebook with a big enough hard disk, you probably won't need to add a Type III hard drive—fortunate, since PC Card hard disks are slower and more expensive than those built into notebooks. Memory is also best installed internally because it's faster and cheaper than the PC Card variety.

The more you use a notebook as your primary machine, the more options you'll want, and the more PC Card slots you should have. More casual notebook users can get away with a modem, period, whether it's a PC Card modem or not.



	Type II	Type III
Usual functions	fax-modems, LAN adapters, SCSI adapters	hard disks, cellular modems

THE STANDARD IN NOTEBOOK OPTIONS, PCMCIA cards are now known as PC Cards. If a Type III slot has two connectors, it can hold two Type II cards.

It's Dead, Jim

Q My old 80MB hard disk gave me plenty of warning before it died. It groaned audibly but allowed me one final backup. In the end it made many bad, loud grunting noises, then crashed completely. I replaced it, but can I have it reconditioned?

Henry D. Wise, Leaksville, Missouri

A Nice description! Sounds as if your spindle bearing failed, a common cause of hard disk death. You might find some unscrupulous technicians who will take your money and attempt to fix it, but they would need a clean room and a vacuum chamber, and the whole operation would cost far more than a brand new drive. No, a dead hard disk is a dead hard disk.

The Flicker Factor and Windows 95

Q I've heard that many people have had trouble upgrading to Windows 95, but I've had only one problem: Ever since I upgraded, my monitor has flickered. Is my monitor going bad, or could this annoying flicker have something to do with Windows 95?

Wayne Carruthers, Dayton

A In some cases Windows 95 resets your graphics card, and that sounds like what happened to you.

When you were still running DOS and Windows 3.1, a Windows or DOS utility set your graphics card's refresh rate—the number of complete screens per second the card tells your monitor to display. Refresh rates of less than 70 screens per second (70 Hz) create the eye-wearying flicker you experience now. When you upgraded, Windows 95 reset your graphics card, so the card no longer knows what monitor it's talking to. Instead of driving your specific monitor at its maximum possible refresh, the card has dropped into its generic mode, probably 60 Hz or less to accommodate old monitors.

The easiest way to bump up that refresh is to run the DOS monitor-setup utility that came with your graphics card. With most cards, if you run this utility once, the card runs at the correct refresh rate thereafter. In other cases a command must also be included your autoexec.bat, so whenever your system boots, the card sets the correct refresh rate. For safety's sake, you should probably restart your computer in DOS mode when you run the DOS utility. Whatever you do, do *not* run the card's Windows 3.1 driver installation routine, because the old 16-bit driver will slow performance and may make your system unstable.

Where is your graphics card's monitor-setup utility? It's probably on your hard disk (if not, it's on a floppy that came with your graphics card). For example, if you have the popular Diamond Stealth64 DRAM, your card's installation software would have created a directory called \s64d, copied over a refresh utility (s64mode.exe), and added a line to your autoexec.bat (c:\s64d\s64mode monitor). Windows 95 doesn't change that autoexec.bat line, so to get the maximum refresh, just run s56mode.exe from Windows 95's DOS

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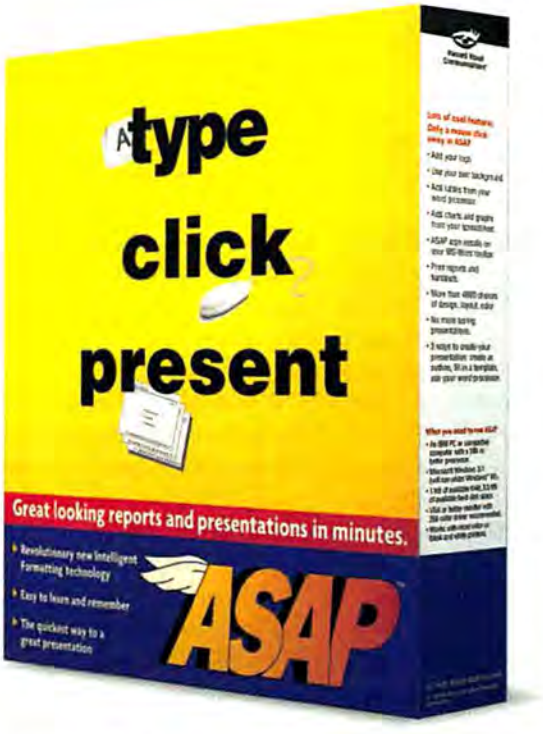

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mode prompt once, and select your monitor model. Thereafter, the autoexec.bat line sets the maximum refresh rate every time you boot Windows 95.

With some cards, including the Diamond Stealth64 DRAM, you can use a more elegant method: Windows 95 "helper" drivers that ensure your monitor runs at its maximum refresh rate. You can download these drivers from Microsoft's page on the Web (**http://www.microsoft.com/**), CompuServe (go **msl**), or the Windows 95 area of the Microsoft Network. The driver is usually in a self-extracting file; drop it into an empty directory, and select *Start/Run* to execute it.

Before you install the helper driver, be sure Windows 95 is using the correct driver for your card and monitor. Open Control Panel, double-click the *Display* icon, and click the *Settings* tab. Now click the *Change Display Type* button. If you see your correct make and model under Adapter Type and Monitor Type, you're ready to install the helper driver. If you see a generic entry for the monitor, click the *Change* button for Monitor Type. Choose *Show all devices* from the Select Device dialog box, select your monitor from the list, and click *OK*. Next, click the *Change* button for Adapter Type and click *Have Disk*. Enter the directory containing the helper driver, click *Close*, click *OK*, and accept Windows 95's suggestion to reboot. If you like, you can now delete the driver line (c:\s64d\s64mode monitor) from your autoexec.bat.

If you can't find your monitor on the 'Show all devices' list, click *Cancel* and do not install the helper driver. Rely on your card's DOS utility instead. If you can't find your graphics card on the 'Show all devices' list, very likely Windows 95 has detected your card's controller chip anyway, and you'll see a cryptic entry such as 'S3 Trio 32/64 PCI' under Adapter Type. Leave this entry alone, and install the helper driver as described in the previous paragraph. If the helper driver, or any display driver, doesn't work properly, run the routine again and reselect the working driver. If Windows 95 fails to boot, you can go into Safe mode (press **<F8>** at boot time) and change any offending drivers.

Put Away That Eraser

In your August *Hardware* column, you passed along some bad advice: Use a rubber eraser on SIMM contacts. That technique may have been appropriate with solder-coated or tinned contacts years ago, but today's gold contacts should not undergo abrasive cleaning. An alcohol-dampened cloth might help and not hurt, but abrasives can wear through the very thin gold surface and expose metals that can oxidize.

Jim Samuelson, Mission Viejo, California

Author's response: The widespread use of gold has eliminated contact problems due to oxidation, and I stand corrected, although wearing through that gold layer would take some pretty heavy erasing.

By Eric Knorr

Eric Knorr is a contributing editor for PC World *and editor and principal author of* The PC Bible *(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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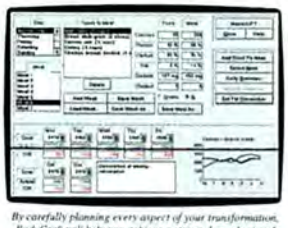

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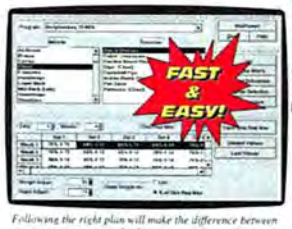

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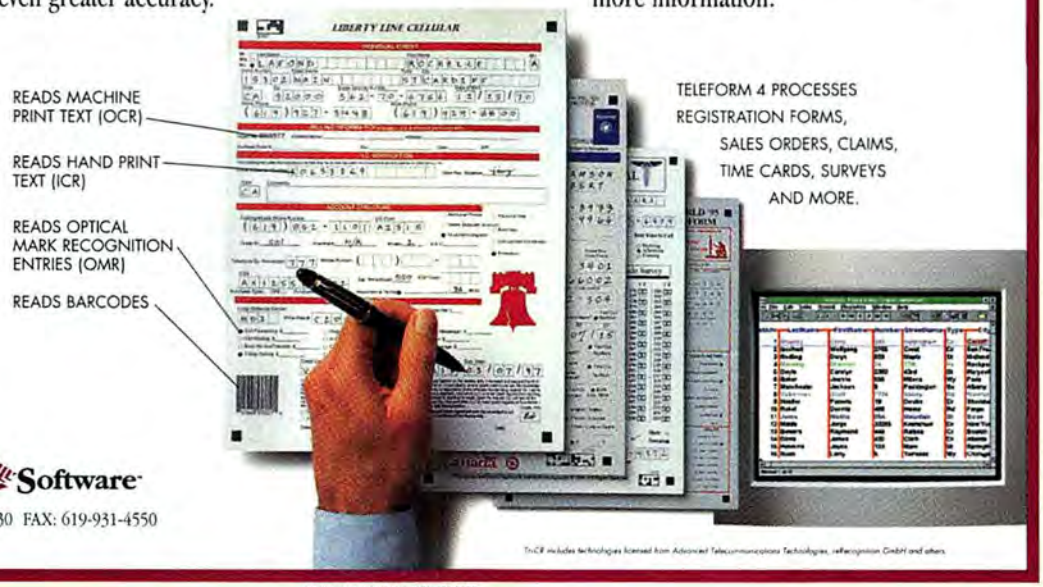

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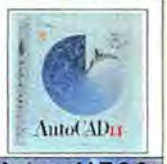
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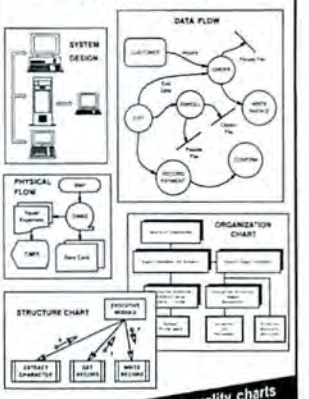

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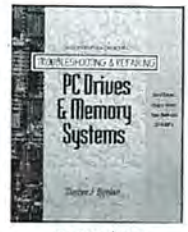

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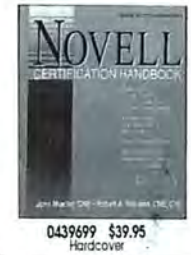

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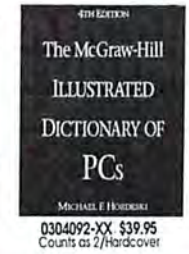

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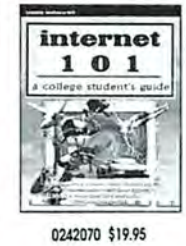

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Premium 386/33TE, 486/25TE, 486/33TE	2 Meg Kit	500780-005	118.00
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Bravo 486/25, 486/33	8Meg Kit	500780-001	378.00
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6450128/92G7202 (4Meg)	57SX, 90, 95, P-75, 57SLC, 5ff, 340LE, P/51, 2365X,	189.00
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	Value Point 77 486DX2, 486SX, SVR 85	
6450125/92G7428 (8Meg)	35SX, 40SX	330.00
6450130/92G7201 (8Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC	339.00
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79F1301 (8Meg)	LX40, N33SX, PS Note		349.00
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	8Meg Module	115561-001	299.00
	32Meg Module	115562-001	1399.00
DeskPro 386/33L, 486/33L	Exp. Brd	116569-001	379.00
DeskPro 386/25, 386/20	1Meg Module	111131-001	79.00
	4Meg Module	111132-001	179.00
DeskPro 386S-16MHz	1Meg Exp Bd	113633-001	149.00
	1Meg Exp Sd	113634-001	249.00
	1Meg Module	111130-001	79.00
	4Meg Module	111134-001	179.00
DeskPro 386/20E	1Meg Exp Bd	113644-001	149.00
DeskPro 386/25E	4Meg Exp Bd	113645-001	249.00
	1Meg Module	111131-001	79.00
	4Meg Module	111132-001	179.00
DeskPro 286N, 386N, 386SX20 all "M" series, sytm LT series, all "I" series	1Meg Module	111131-001	79.00
	2Meg Module	111685-001	99.00
	4Meg Module	111690-001	159.00
	8Meg Module	111691-001	299.00
M Series Exp Bd	2-4Meg Exp Bd	129160-001	129.00
DeskPro 386/16	4-8Meg Exp Bd	108069-001	239.00
	512K Kit	113012-001	437.00
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DeskPro 5/60, 5/66M, 5/66M ALL OF THESE MACHINES USE THESE MODULES	16Meg Kit	149911-001	379.00
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LTE/386S/20	4Meg Module	121135-002	209.00
LTE LITE/20, 25, 25C	4Meg Module	129769-002	209.00
LTE LITE/20, 25, 25C	8Meg Module	129769-003	439.00
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LTE LITE 425C/20C/25E/25L	4Meg Module	142337-002	169.00
LTE LITE 425C/20C/25E/25L	8Meg Module	142337-003	349.00
LTE LITE 425C/33C/25E/25L	16Meg Module	142337-004	619.00
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Contura 320, 325	2Meg	139497-001	99.00
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Contura 420, 430	4Meg/8Meg/16Meg/32Meg		179/359/619/729
Contura 4/25, 4/25C, 4/25CX	4Meg	146520-001	179.00
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T2100, 2105, 2150	4Meg-8Meg		179/349
T2100, 2105, 2150	1Meg-2/4Meg		69/179
T4400SX, SXC T6400, T6600	4Meg	PC-PA2004U	189.00
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T4400SX, SXC T6400, T6600	16Meg	PC-PA2010U	689.00
T4500, C, T4900, T4700, T1900, C, T1910, T1950 (3.3 v)	4Meg	PC-PA2017U	169.00
T4500, C, T4900, T4700, T1900, C, T1910, T1950 (3.3 v)	8Meg	PC-PA2013U	349.00
T4500, C, T4900, T4700, T1900, C, T1910, T1950 (3.3 v)	16Meg	PC-PA2014U	652.00
T4700, 4900, 4950 (Hard Drive)	524Meg/710Meg/1.3 Gig		739/965/1119
T3400CT, T2400, T3600	4Meg/8Meg/16Meg	PC-PA2019U	179/349/619
T3400CT	32Meg		899.00
T3100SX	2Meg	PC15-PA8308U	199.00
T3100SX	4Meg	PC16-PA8310U	189.00
T3200/T3500	2Meg	PC-PA8304U	69.00
T3200/T3500	4Meg	PC10-PA8312U	369.00
T600, 610, CT, T400	8Meg/16Meg/32Meg		469/884/1399

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
ACER 730, 735C, 740, 780	2Meg-4Meg-8Meg		105/179/359
ACER 750, 755, 782, 784, 786, 787,	4Meg-8Meg-16Meg		179/359/629
ACER 7250	4Meg-8Meg		179/359/629
ALR Venture	4Meg	12407880	249.00
Altima Virage	4 Meg, 16 Meg		189/619
Altima Virage II	4Meg-16Meg		189/799/1279
AST Advantage Ameriuse 486C, 6360, 8360C	8Meg/16Meg/32Meg/64Meg		379/759/1249/2599
AST Ascentia 900A, 800N	4Meg/8Meg/16Meg		179/349/629
AST Ascentia 900	8Meg/16Meg		349/629
AST Bravo & Explorer	4Meg-8Meg-16Meg		179/359/629
AST Bravo MS, MS-L, Advantage P/90	8Meg/16Meg/32Meg/64Meg	501255-001, -002	189/359/749/1499
AST Notebook Prem Exec 3/66SX/20/25/25L	4Meg-8Meg	500814-003	379/759/1249/2499
AST Notebook Prem Exec 3/66SX/20/25/25L	4Meg-8Meg	500814-003	179.00
AST Power Exec 3/25C, 425EL, 425SL	4Meg/16Meg	501166-001, -003	189/629
AST Power Exec 4/33SL	4Meg/8Meg/16Meg	501318-001/002	189/379/629
AT&T Globalyst 130	4Meg/16Meg		179/679
AT&T Globalyst 200	4Meg/8Meg/16Meg		189/359/679
AT&T Safari NSX/20	4Meg	PEC37851	259.00
Austin DX4, DX2, SX2, SX Series	4Meg/16Meg		199/899
Bundwell 6310, Plus	4Meg	23050-09100	69.00
Bundwell 8310V, SX	1Meg/4Meg		109/229
Canon Innova Book 150	4Meg/16Meg		179/629
Canon Innova Book 200LS	4Meg/8Meg/16Meg/32Meg		179/359/629/979
Canon Innova 486	2Meg/4Meg/8Meg		109/229/443
Canon Innova 486-10	4Meg/16Meg		189/629
Canon Notepet 486	4Meg/16Meg		189/629
Canon Notepet DX4/75	4Meg/8Meg/16Meg		189/379/629
Compudata 425TX Notebook	4Meg/8Meg/16Meg		179/359/629
CTC Hillside Ultra Hybrid	4Meg/8Meg/16Meg		199/379/669
Dell Latitude LX 4100D, XP 4100D	4Meg/8Meg/16Meg		209/389/729
Dell Latitude M, MC, MCX	4Meg/8Meg/16Meg		189/359/639
Dell Latitude XP, 475, 4100, 4100CX	4Meg/8Meg/16Meg		189/359
Dell Latitude 466, 425, 433C, 433CX, 450, 450CX	4 Meg/16 Meg		189/359
Dell XPS 410CP Notebook	4Meg/8Meg/16Meg		189/359/629
Epson ActionNote 650 650c	4Meg/8Meg/16Meg		179/359/629
Epson ActionNote 700, 700C, 700cx	4Meg/8Meg/16Meg		179/359
Epson ActionNote 850, 850c	4Meg/8Meg/16Meg/32Meg		179/359/679/979
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Midwest Micro Elite Studia 3/33, DX2-50, DX2-66	4Meg/8Meg/16Meg		199/389/629
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Panasonic CF-121P, CF-580	4Meg/16Meg		219/819
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Sanyo 1700	4Meg	MBC-A866ME2	109.00
Sharp 6781, 6881, 6785, 6700, 6800, 6741	2Meg/4Meg		109/179
Sharp 8150, 8650, 8660, 7150, 7760	4Meg/16Meg		179/579
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Twinhead Slimnote 5	4Meg/8Meg/16Meg		199, 379, 649
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Canon LBP 860	–	–	–	99	–	–	149	–	–	349	669	1249
Canon LBP4, 4lite, 4plus	–	–	129	179	–	–	–	–	–	–	–	–
Epson 6000, Action Laser	–	–	–	129	–	–	229	–	–	–	–	–
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954 Monitors and video boards
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958 Printers
959 Multimedia products
960 Utilities
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Consumer Watch

Software Bundles: How Good Are They?

BY ROBERTA FURGER

My neighbor just bought a new computer for her family. It's a Pentium with a fast CD-ROM drive, a nice monitor, lots of memory, and a huge hard disk. But what finally sold her on the PC was the software—20 programs to be exact, including a home budgeting package, an encyclopedia, integrated software (spreadsheet, word processor, and database), and games for the kids. The way she sees it, her family now has enough software to last them a year—or at least until they've finished paying for the computer.

It's hard *not* to be enticed by software bundles (all the free stuff that comes preinstalled on new PCs). My neighbor's computer had some gems: Quicken, Microsoft Encarta '95, and Microsoft Works. But a lot of the other software was just so-so—an outdated golf game, some mediocre kids' CD-ROMs, and a stripped-down version of the WinComm fax utility. It wasn't until she got it home and started playing with it that she realized she'd never use a lot of her new computer goodies.

At first blush, all the software deals look terrific. But don't be swayed by the number of CD-ROM titles that come with a PC, or the computer maker's estimate of the retail value of the bundle. You need to do a little checking to determine how *good* the software is and whether the mix is well suited to your household.

Here are some guidelines to follow the next time you're shopping for a new PC—and wondering just how good a deal all that free software really is.

Don't assume you're getting the full retail version. Although many preinstalled packages are identical to the retail versions, there are some notable exceptions. For example, many PC makers include Quicken Special Edition, a "lite" version of the retail package. Among the features *not* available in the Special Edition: the bill payment calendar, investment tracking, home inventory, and some reports. You can upgrade to the retail product for $10 or $15, depending on whether you want the regular edition or the deluxe CD-ROM. Other products that are sometimes offered in a lite version include fax software and multimedia encyclopedias. Most of the time, it's easy to identify a trimmed-down version of a retail product. Look for an extension after the product name, such as "Lte" or "SE." But if you can't tell, ask the manufacturer or sales rep.

Check the version number. Is it the current offering from the software company? If not, you may be disappointed when you find that some of the features you read about in a recent review are missing from your copy. Version changes are usually not an issue with games or with most CD-ROM titles. But home budgeting software, integrated packages, and multimedia encyclopedias are regularly updated. Most PC makers switch to newer versions of software as they become available, but it typically takes them about three months to roll

ERIK BUTLER

out systems bearing the new version of a software package.

Ask who you call for technical support. Many hardware companies are now charging for software support, so you'll save money—and a bit of runaround—by finding out who supports the bundled software. At a minimum, most PC makers should answer installation or troubleshooting questions, but for help on how to use the software you'll probably have to call the software developer. If you think you'll need help, find out if you'll have to pay for support. If your salesperson doesn't know the answer (and they probably won't), check with the technical support department at the PC or software company.

Explore your options. If you buy retail, you're pretty much stuck with the software selection a PC maker chooses to bundle. But you may have some choices if you're purchasing a mail-order system. Gateway 2000, for example, will let you choose between its Generations Software Collection (a mix of home productivity and entertainment packages) and Microsoft Office. Similarly, Quantex offers a "professional" and a "family" bundle.

TIPPING THE SCALES

Sure, a great software bundle shouldn't be your main reason for buying a particular PC. Reliability, service, price, and the right mix of features are always going to be your top considerations. But after you have narrowed the list down to only a couple of computers, take a look at the selection of software. It may just tip the scales.

As always, you can contact Consumer Watch *with questions or problems. See page 12 for contact information.*

Surveying the Software Bundles

All home PC bundles are not created equal. Here's a breakdown of the number of software applications and CD-ROM titles included with the latest home systems.

	Productivity	Reference	Games	Children's	Other	Comments
Acer Aspire	3	2	5	5	4	Otherwise respectable mix doesn't include an encyclopedia.
Compaq Presario 5500/9500 series	4	3	1	5	10	Blockbuster suite covering gardening, trip planning, and more.
Compaq Presario 7100 series	3	2	3	3	5	Compaq's scaled-down suite.
Digital Starion	2	3	2	1	0	So-so sampling of Microsoft home products. Only one kids' title.
Epson ActionTower 7000 and 8000	4	2	1	5	3	Nice mix, including a medical guide and card-making software.
Gateway 2000 PCs	3	6	1	0	3	Fine selection of Microsoft home products, but no kid stuff.
Hewlett-Packard Pavillion line	3	2	4	4	6	Lots of stuff, but only a few real gems.
IBM Aptiva	3	1	4	5	7	Lots of titles, with games for everyone.
Micron Home MPC	2	2	1	0	2	Just the basics.
Micron Home MPC Pro	5	2	0	0	3	Home office heavyweight offers Microsoft Office and Quicken Deluxe.
NEC Ready line	3	1	4	4	3	Highlights: Delrina's Echo Lake and Microsoft Publisher.
Packard Bell PCs	2	2	2	5	6	Something for everyone: sports, cooking, and home projects.

TOP: J.D. KING; RIGHT: JAMES YANG

Feedback

Double Fun

Jack Sexton wrote to us because he couldn't get his brand-new NEC double-speed CD-ROM drive to work. When he contacted NEC, he was told to call the company that sold him the drive. According to NEC, vendors are supposed to sell these drives only with PCs or other hardware. NEC's contract with these manufacturers makes them responsible for support. We forwarded Sexton's letter to NEC and were surprised when the company replaced the drive with a new quad-speed CD-ROM drive. NEC also apologized for Sexton's poor experience with the firm that sold him the drive. It helps to speak up when a company's business practices aren't working for you.

TAKE NOTE: **Cyberpope live! The first virtual Mass was delivered by Pope John Paul II on October 8, 1995, from Baltimore's Camden Yard Stadium. ABC provided a text simulcast via America Online.**

We Forgot?

We received several angry letters from customers of Windows Memory Corporation in La Jolla, California. Each customer—in response to an ad in *PC World*—sent SIMMs to the company in exchange for cash. But once the memory was in the hands of Windows Memory, relations soured. The company made repeated promises to send the money it owed, and then offered excuses as to why it hadn't. Customers waited several weeks before finally contacting us for help. We contacted Windows Memory and spoke to its president, Mark Elliot. He told us all the customers now have their money and insisted none of the delays were out of the ordinary. They were caused, he said, by the necessity to test the memory before cutting a check.

Virtual Confidence Games

Bohdan Sukiennicki of Mountain View, California, had a frightening introduction to the

Cybertoys for Everyone in the House

Art supplies, music appreciation, foul-weather games

KidDraw for young artists

DIGITAL CRAYONS

"Cool!" That's how my 6-year-old daughter, Jessie, describes kidDraw, a drawing tablet from kidBoard. The tablet and its accompanying stylus are somewhere between a mouse and a crayon; you move the stylus across the tablet's surface, like you would a pen on paper, to draw on screen. The 6-by-8-inch tablet sells for $110 and comes with Crayola Art, a children's art program from Micrografx. KidDraw hooks up to the serial port and comes with a separate power supply. It takes time to adjust to a tablet and stylus, so it might be frustrating for little fingers at first. But eventually you get finer control than with a mouse, and have a lot of fun in the process. —*Roberta Furger*

- **kidDraw** $110 street; kidBoard Inc.; 800/926-3066. Grade: B+

Reader service no. 775

MUSICAL MUSE

This music clearinghouse CD-ROM is meant to entice you to sign on to The Microsoft Network for updates and current album reviews. Music Central 96 is a fine guide and encyclopedia for the general music enthusiast. Mainstream pop and rock make up the core of the CD-ROM, but the ecumenical slant of savvy editor Sam Sutherland will encourage even the most orthodox to check out the likes of Woody Guthrie, Charlie Patton, and Ornette Coleman. Easy to navigate and pleasing to look at, Music Central offers fairly paltry snippets of music but excellent performance footage; opinionated reviews and ratings; decent, if perfunctory, articles; good research tools; inventive suggested-listening spin-offs; and ordering information. From the ridiculous (Donny Osmond) to the sublime (Modern Jazz Quartet), this disc covers a lot of territory. —*Derk Richardson*

- **Music Central 96** $44.95 street; Microsoft; 800/426-9400. Grade: B+

Reader service no. 776

RAINY-DAY GAMES

World peace is threatened by an evil sociopath who controls the weather. As part of Operation Weather Disaster, a squad of science rangers, you must thwart the Weatherman's efforts. The game (geared for ages 10 and up) tests your logic and fact-finding skills, whether you're using a tube sock to measure wind direction or employing a piece of gum to patch an ancient barometer. Detailed graphics and video please the eye, while challenging situations keep you entertained and expand your meteorological knowledge. —*Angela Freeman*

- **Operation Weather Disaster** $49.95 list; Discovery Multimedia; 800/762-2189, 317/579-0413. Grade: A-

Reader service no. 777

PHOTO: MICHAL VENERA; ICONS: JOHN HERSEY; ILLUSTRATIONS: TOP, J.D. KING; BOTTOM: JAMES YANG

FEEDBACK CONTINUED

online world after signing up with America Online. He'd been online only a few minutes when a message flashed across his screen demanding his name and address if he wanted to prevent his account from being closed. He complied. A few minutes later, another message requested his credit card number. The message looked official, so he provided the number, figuring he had done something wrong when he joined (he'd given his credit card number, as required, at sign-up). But he promptly reconsidered the act, logged off, and called America Online's billing office. There his fears were confirmed: The message was a hoax. He canceled his credit card, closed his AOL account, and escaped relatively unharmed. Sukiennicki was lucky. Remember, there is no legitimate reason for anyone to request your credit card number online unless you're shopping in a secure site.

TAKE NOTE: No CD-ROM drive? Pay up! If you bought Win 95 on 3½-inch disks, you probably discovered they lack the Net access files that are on the CD-ROM. What's worse: You paid another $10 for them.

The Uncluttered Desk

It seems like no matter how many copies of the Yellow Pages you have, there's always one more city you need them for. Well, now you can recycle the entire mess. Check out http://www.telephonebook.com on the Internet, and you'll find Yellow Pages for the entire country. You can search by company name or type of business, specify a zip code, an area code, and more. Let your fingers do the walking—at cyberspeed.

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Thanks to a new service provided by CompuServe, you may be able to receive e-mail right on your belt. By the time you read this, you'll be able to have e-mail messages sent to your pager. Soon you'll also be able to set up a filter that allows only messages you deem important to reach your pager.

By Christina Wood

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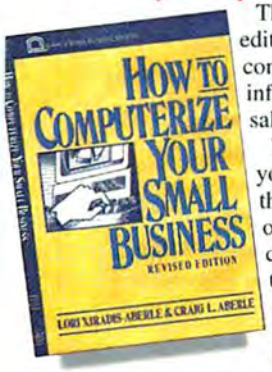

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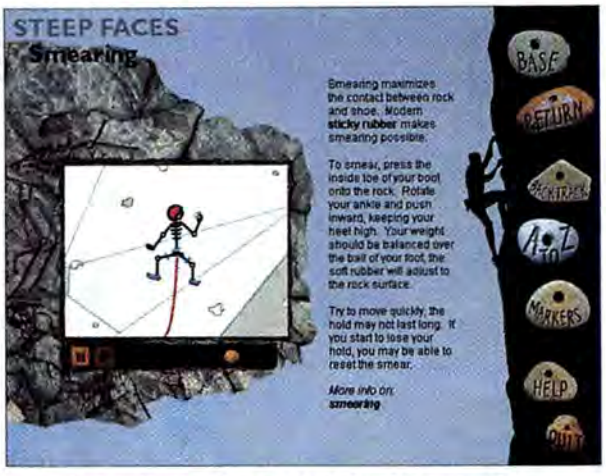

In Rock Climbing, a skeleton is your guide.

A WELL-PLACED NUT

"Twenty feet out I lost a smear and started poppin' pro. My last two hexes zippered, but a well-placed nut saved my bacon." For a translation—and a lot more—dig into this rock-climbing CD-ROM tutorial. You'll catch the jargon, study the equipment, and learn hundreds of techniques. Demonstrations are performed by a sporty skeleton who illustrates the joys of a good "lay-back" and the shattering consequences of a bad fall. An excellent reference for the serious beginner, but experienced climbers will be bored. —*Kirk Steers*

- **Rock Climbing** $49.95 list; Media Mosaic; 800/972-3766, 503/225-1988. Grade: B

Reader service no. 778

A HYPOCHONDRIAC'S DREAM

A daunting, four-CD-ROM digital drugstore on steroids, this pharmaceutical encyclopedia is a guide to every pill, ointment, and even laxative on the market. Click on any drug, and you get dosage, side effects, interactions—even pronunciation. Hosted by pharmacist Max Leber (sounding like he has a case of postnasal drip), the video seems superfluous, with advice on avoiding sunburns and preventing foot odor. —*Leslie Crawford*

- **Dr. Schueler Presents the Corner DrugStore** $40 street; Pixel Perfect Software; 800/788-2099. Grade: B

Reader service no. 779

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- **First Light** $99.95 list; Virtual Reality Laboratories; 800/829-8754, 805/545-8515. Grade: B+

Reader service no. 780

COMING UP

Pentium Competitors: Sorting Out the Chips

Possibilities for your PC have never been so confusing. Do you want a midpowered Pentium or a new Pentium Pro? And what about Cyrix and NexGen? We unravel the mysteries of Pentium-style processors.

Operating System Wars: The 32-Bit Battle

Now that Windows 95 hype has blown over, what should you demand from your OS? We tested Windows 95, Windows NT, OS/2 Warp, and the Mac's System 7.51 to crown today's 32-bit King of the Hill.

The Great E-Mail Race: Going Postal

Which online e-mail option is fastest, cheapest, and easiest? We used AOL, CompuServe, MCI, Microsoft Network, Prodigy, and the Internet, only to find the best bargain isn't always the best software.

Also Next Month

- **The PC World Top 20 Power, Budget, and Notebook PCs, and the Top 10 Personal Printers, Graphics Boards, 15-Inch Monitors, and Modems.**
- **CD-ROM Phone Directories: What's best for finding phone numbers or developing mailing lists?**
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Kitchen Windows

Recipe software—it isn't all out to lunch.

BY LINCOLN SPECTOR

As I write this, my once and future kitchen is a construction zone, and my family is living out of a microwave in the den. Since I can't really cook right now, my thoughts turn to recipe software.

I've always been skeptical about software that claims to help in the kitchen. If you suddenly discovered a surplus of spinach in the fridge, would you go to your office, boot your computer, load a program, search for *spinach*, choose a recipe, then print the recipe and a shopping list? You would? Okay, but would you manually type in all of your favorite recipes from books and newspapers? I didn't think so.

The MasterCook packages come with easy-to-use software, tempting photos, and so-so recipes.

Despite my doubts, I decided to look at recipe software as soon as my editor told me to. My conclusion? If you've got a lot of recipes, a good program will make them easier to find. It also makes them easier to reprint if you spill chocolate all over them.

Ideally, a program should make it easy to enter new recipes, sort them by category, and find and print the ones you want. It should also come with an extensive and varied collection of delicious, easy-to-follow recipes.

The best recipe software, if not the best recipes, comes from Sierra On-Line's MasterCook series of programs. The MasterCook software, recently acquired from Arion Software, makes entering a new dish a breeze—or at least as much of a breeze as typing a recipe can be. The dialog boxes are clear and concise, with helpful pick lists for measurement units and ingredients. And if an ingredient isn't on the pick list, you just type it into your recipe with no hassles. Not so with other programs, one of which wouldn't let me enter a jalapeño into a recipe (something my dad still won't let me do).

MasterCook gives you plenty of categories and lets you assign your marshmallow pasta salad to all that seem appropriate. It can scale a recipe to serve fewer people—although that may result in a request for ¼ of an egg. MasterCook also features an extensive search engine to help you find, say, a pear casserole you can cook in under an hour. A new generation of MasterCook software, which wasn't available in time for this article, will let you e-mail recipes over the Internet, import them from other formats, and watch your health via a nutritional database.

By the time you read this, three MasterCook products should be available with the new software. MasterCook 3.0 will ship on floppies and provide you with more than 1000 recipes from various sources. MasterCook Deluxe, a CD-ROM, will add over 600 more recipes (from the California Culinary Academy) to the mix, as well as photographs. And MasterCook Cooking Light, another CD-ROM, will have its own set of 1250 low-fat recipes from *Cooking Light* magazine.

JAMES YANG

TASTER'S CHOICE

For advice on the recipes, I turned to my friend Naomi Wise, who, unlike me, has pro cooking experience and a working kitchen. She found the California Culinary Academy collection in MasterCook Deluxe to be "hit and miss," though "twice as good" as the standard MasterCook set.

Naomi preferred Mangia, from Upstill Software. Most of Mangia's recipes come from 1980s issues of *Cooks* magazine, which "brought restaurant-quality cooking to the home chef." Mangia's software isn't as easy as MasterCook's, but it's usable.

So what do you want: a great recipe manager or a great collection of recipes? Me? I want a kitchen.

- **Mangia** $49 street; Upstill Software; 800/568-3696
  Reader service no. 703
- **MasterCook 3.0** $34.95 list, **MasterCook Deluxe** $44.95 list, **MasterCook Cooking Light** $39.95 list; Sierra On-Line; 800/757-7707, 206/649-9800, 408/644-2018 (fax)
  Reader service no. 704

Lincoln Spector is a PC World *senior associate editor. See page 12 for contact information. Freelance writer Naomi Wise contributed to this column.*

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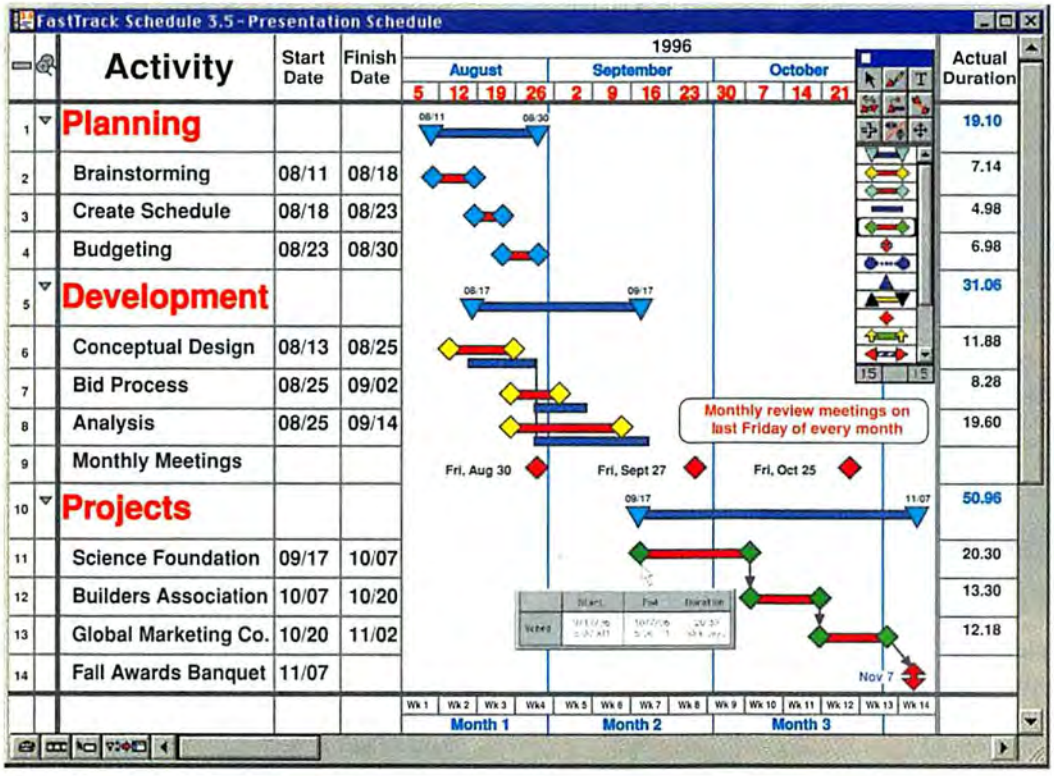

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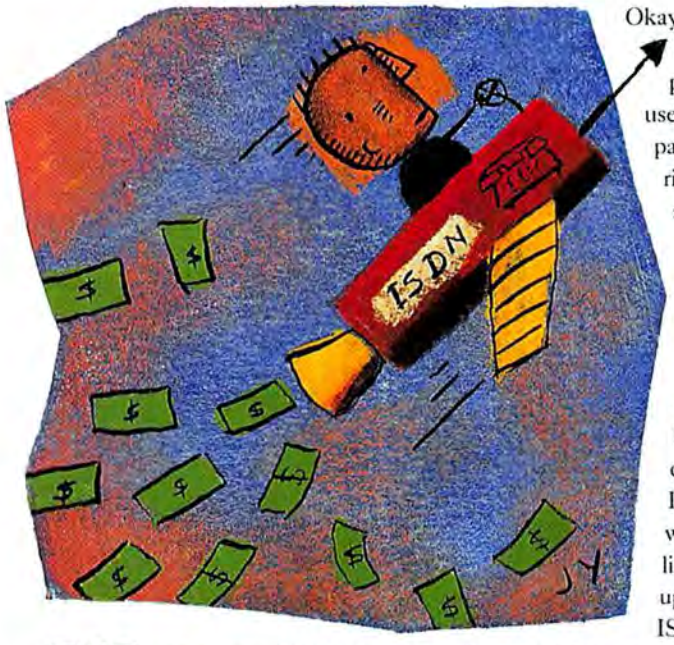
ISDN: Tough as Rocket Science

Want superfast Internet access? It's going to cost you plenty.

BY STEVE BASS



Want to save $1000 plus days of grief, aggravation, and emotional trauma? When someone suggests you install an ISDN high-speed phone line, act quickly. In a loud, authoritative voice, shout "No!" and then run. Don't wait for them to describe Web pages popping on the screen. I know: I've been there, and it ain't worth it.

When it works, ISDN, which stands for Integrated Services Digital Network, allows you to connect to the Internet at speeds that *are* truly astonishing. For example, my conventional modem sends data across regular phone lines at 28.8 kbps. Connect an ISDN modem to an ISDN line and, if it's all properly configured, you can get online at 128 kbps—a little over four times as fast. The trick phrase is "properly configured." The best I could manage was about 64 kbps, which was still enough to knock my socks off. Web pages full of graphics popped effortlessly onto the screen, bringing tears to my eyes. I downloaded an 800K file in less than a minute. Folks, that's *fast*.

Okay, so with all this blazing speed, why aren't I happy? In all the years I've used PCs, nothing compares to the horror I experienced getting ISDN installed, nor has anything cost me as much for the smallest gain.

First, getting ISDN installed is like disciplining a class of unruly children: You never know who to blame. Pacific Bell brought the ISDN lines to my house, where an inside–phone-line installer hooked them up. Motorola supplied the ISDN "modem" (technically, it's not a modem, but everyone uses the word). And let's not forget the Internet provider people and the special software.

WIPEOUT

I went for the Motorola "modem," the external BitSurfer ISDN-only terminal adapter, because I figured I could connect it in seconds. But once I had it hooked up, it seemed to take eons to get the thing configured and working, even with a dozen tech calls to both Pac Bell and Motorola.

Did I mention that you may need a new Internet provider, since most don't support ISDN? I connected to PSINet because it offers 24-hour, seven-day-a-week tech support. (Yes, I used it plenty. And no, it's not toll-free.) After 20 minutes on hold and an hour of tech support, I still couldn't connect to PSINet's local phone numbers. So much for avoiding a long-distance number.

But tech support charges are minor compared to other ISDN costs. Start with having the crazy thing installed. In California, Pac Bell's installation runs $34.75, plus $85 to run the line and special jack into your office. At $249 discounted, the BitSurfer is as cheap as ISDN modems go. PSINet charges a $9 registration fee, plus $50 for NetManage's Internet Chameleon software (most Net software lacks ISDN drivers). That's over $400 before you can get online.

THE COST OF SPEED

Then there are the ongoing fees. Pac Bell charges $24.50 a month, plus a per-call charge during the day (calls are free at night). PSINet charges $9 a month, plus $1.50 for each hour after the first nine. Over a year, that's a little over $400 if you don't make a single call.

When I first heard about ISDN, I really believed the hype: You know, it would bring peace to Bosnia, cure cancer, and end yellow waxy buildup on my kitchen floor. (Hey, at least I didn't fall for the Windows 95 hype.) But at a cost of more than $800 for the first year's worth of ISDN—plus all the time lost—it's not worth it.

[Editor's note: While researching this article, fact checker Richard Overton received confused and conflicting price information from Pacific Bell. ISDN just might stand for I Still Don't kNow.]

- **BitSurfer** $375 list; Motorola; 800/365-6456, 205/430-8894 (fax-back)
  Reader service no. 705
- **PSINet** price varies by plan; 800/827-7482, 703/904-4100, 703/904-4200 (fax)
  Reader service no. 706

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.

ILLUSTRATIONS: TOP LEFT, JAMES YANG; BOTTOM RIGHT, JOHN HERSEY

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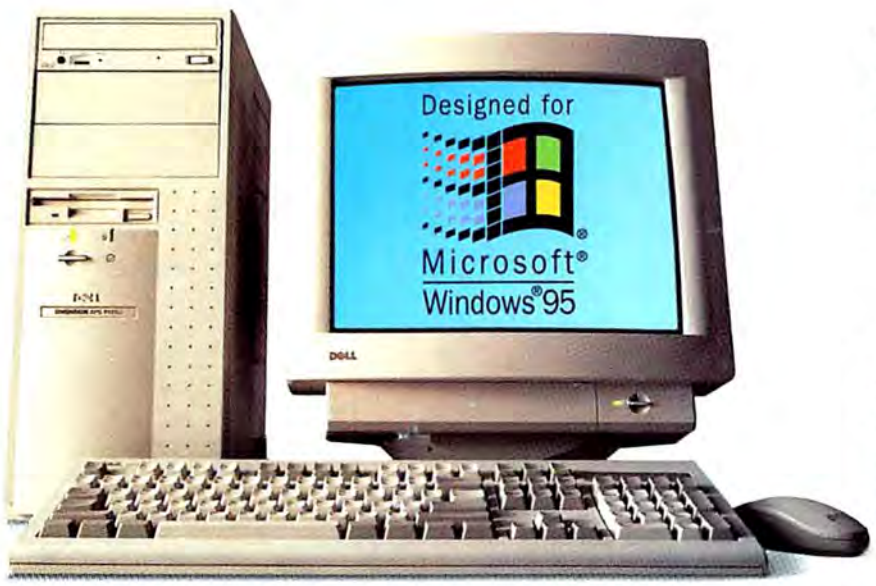

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