PC WORLD

February 1993

THE 486 PUZZLE

We Test 25 PCs With 7 Different CPUs to Find the Best Mix of Speed and Price

75 TIPS FOR BETTER WORD PROCESSING

WINDOWS FAX SOFTWARE ROUNDUP

OPERATING SYSTEM WARS: OS/2 vs. NT







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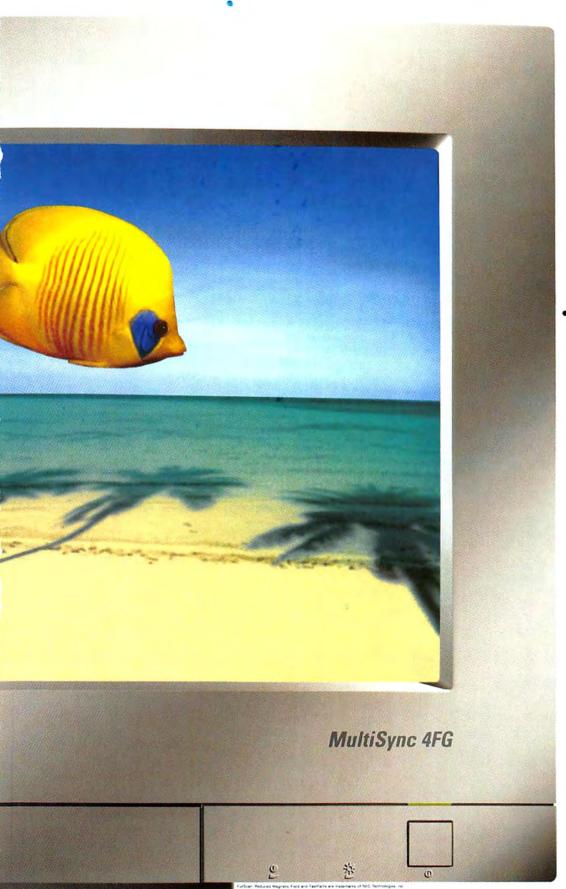
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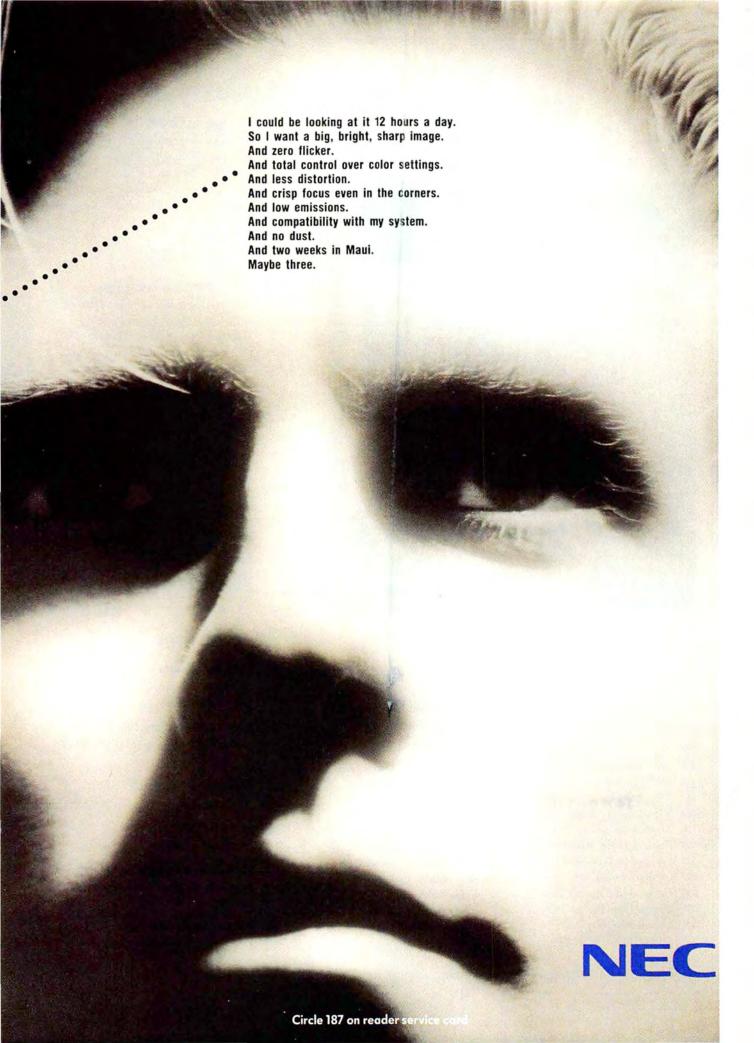




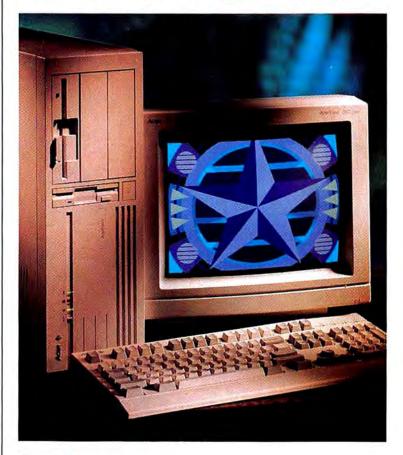




It's as if we monitored your thoughts.



PC WORLD



Cover Story

25 New 486s: The Quest for the Best PC

116 DX, SX, DX2, 50 MHz, 66 MHz, 33 MHz... Today's bewildering array of 486 systems can paralyze even the savviest shopper. What's the smart buy? We test 25 top 486 PCs with 7 CPUs to find the answer. The contenders:

- 120 Acer AcerPower 486e DX2/50
- **121** Acma 486DX2/50
- 122 ALR Flyer 32 LCT
- 122 AST Bravo 4/66D Model 123B
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Cover photograph by Robert Cardin, digital composition by Varitel Select

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Word Processing

178 75 Hot Word Processing Tips

Admit it: You're still using just a fraction of those whiz-bang features your word processor offers. But don't haul out that shrink-wrapped manual. These 75 quick tips for the most popular word processors—WordPerfect, Microsoft Word, Ami Pro, and WordStar—will help you wring more from your software instantly.



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Innovative and competitive: 18 Pentiumready, local-bus 486 PCs debut.

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Microsoft's new Windows for Workgroups promises painless networking, integrated E-mail, and group scheduling—all set up the way you want. Does it deliver? Find out from an intrepid PC World work group that took the plunge.

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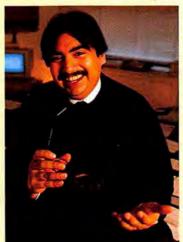
These next-generation operating environments promise to unleash the real power of 386 and 486 machines. Is it time to turn them loose on your desktop?

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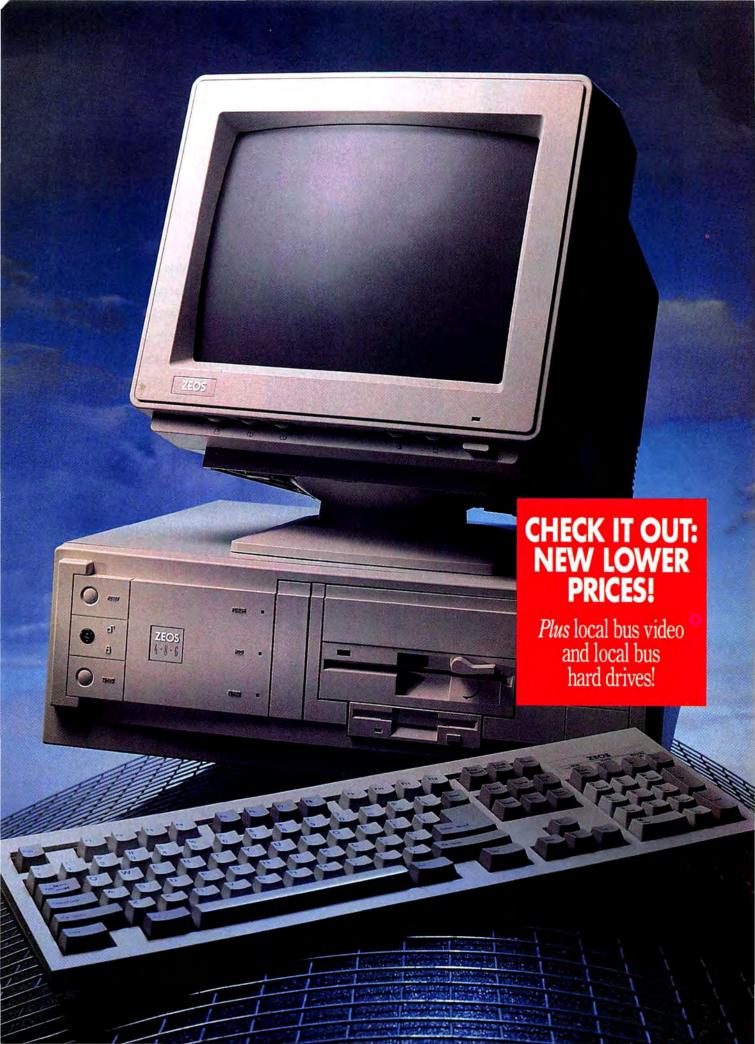
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Now that's ZEOS value.



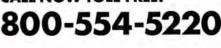
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- 4MB RAM (to 32MB)
- · 210MB Hard Drive
- · 14" VGA 1024x768 Non-Interlaced Monitor
- · Windows Accelerator Video Card
- UPGRADABLE

486/50 WinStation

- Intel i486 running at 50MHz w/ 128K Cache
- · 4MB RAM (to 32MB)
- · 210MB Hard Drive
- 14" VGA 1024x768 Non-Interlaced Monitor
- Windows Accelerator Video Card

* 486/DX2-66 EISA WinTower

\$3599

- Intel i486DX2 running at 66MHz w/ 128K Cache
- 8MB RAM (to 128MB)
- 330MB SCSI Hard Drive, EISA SCSI Controller
- 14" VGA Monochrome Monitor
- Tower Chassis

486/SLC-25 NetStation

- Cyrix 486SLC running at 25MHz
- 1MB RAM (to 16MB)
- . Choice of 1.44MB or 1.2MB Floppy Drive
- 14" VGA Color Monitor
- 16-Bit Austin Combo Ethernet Adapter

(DOS, Windows, Mouse not included)

486/DX2-66 EISA SuperServer \$9999

- . Intel i486DX2 running at 66MHz w/ 128K Cache
- 16MB RAM (to 128MB)
- · RAID 5 EISA Controller w/ 2.4GB Drive Array
- 32-Bit Austin Combo EISA Ethernet Adapter
- 14" VGA Monochrome Monitor
- Tower Chassis

386/SXL-25 Notebook \$1899

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Whenever you want an application,

gives you a multitude of utterly sensible program groupings - 17 of them. ized ones you dream up yourself.

by simply clicking "Spreadsheet." Sum-

Direct Access searches your bard disk, groups your applications logically and generates menus and submenus

automatically.

All you have to do is point and click.

mon a word processor by stroking "W." And access a DBMS by selecting, you guessed it, "Database."

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And that doesn't count the custom-

It means you can get to a spreadsheet

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> But if you're responsible for a department full of PCs, Direct Access is priceless.

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do is hit one key.

Or, if you prefer, click one

The more applications you have on your disk, the more you'll delight in Direct Access.

That's because Program Manager insists on grouping your programs into five arbitrary categories: "Windows Applications," "Non-Windows Applications," "Accessories," "Games" and "Main."

Not very intuitive, eh?



Tale of a Rogue Network

n December, Editor Eric Knorr's "Complete Guide to the New CPUs" gave you background on the performance of a variety of Intel and Intel-compatible microprocessors. Our system review this month goes a step further and reviews specific, currently available PCs that are based on seven different 486 CPUs. Four of these processors come from Intel: the 486SX-25, the 486DX2-33, the 486DX2-50, and the 486DX2-66. Two systems have Cyrix inside: the 486SLC-25 and the 486DLC-33. One has IBM's 486SLC2-40.

Besides providing much broader information on actual system performance running DOS and Windows 3.1 applications, this month's review factors in major real-world considerations such as street prices and service and support. Processor performance in the abstract can be interesting, but you can't buy an abstract computer. We think the information in this review gives the best account anywhere of the real benefits that systems based on these processors can bring to your desktop today.

Do-It-Yourself Groupware

"Windows for Workgroups: Operation Rogue," the exciting tale of our first adventure with Microsoft's new Windows for Workgroups, speaks not only of peer-to-peer networking but also of differences in attitude about who should control what aspects of an office's computers. What makes Windows for Workgroups so interesting is its projected use as the mechanism through which do-ityourself groupware can happen. Lotus Notes has far superior capabilities for supporting the major tasks involved in running an organization of any size. Notes, however, can only be adopted from above. As things stand now, you and your closest colleague can't, of your own volition, divide up a project using Lotus Notes on any existing Novell network. Rather, you must first convince your department or company to adopt Notes. By the time everyone agrees to this, you'll have completed your project using the awkward mechanism of E-mail and file import. Indeed, you and your colleague may even have moved on to other departments, companies, or careers.

The processes often required to adopt *Notes* deprive it of the benefit of pull-through demand from you and your colleague. That kind of demand has been the most powerful single

engine driving the PC revolution. Microsoft's strategy is to harness that demand and let you and any co-worker grab Windows for Workgroups off the shelf. Just install it, get the new application releases that exploit it, and start dividing your work. When these applications ship, you'll be able, with effort, to divide and reintegrate a project by using menus and dialog boxes in the updates of the most common Windows applications.

Do-it-yourself groupware built on Windows for Workgroups gives Microsoft an excellent chance to quickly build a large installed base for groupware. Yet this groupware will lack integration, power, and adaptability to very large work groups and even whole companies—Notes' greatest strengths. Oh, for a cheap Notes Two-Pack that comes with canned run-your-office applications and coexists happily with Novell!

Some view peer-to-peer networking on an existing company client-server network as worse than a virus, for it infects the hierarchy of the organization instead of mere programs and data. While programs and data are easily



backed up, let's face it even the best disk utilities could never restore a human hierarchy. Senior Editor Steve Fox's tale of a rogue network gives an

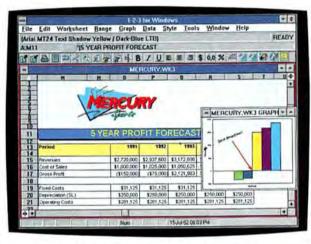
PC World Editor in Chief Phil Lemmons

inkling of the productivity gains, political risks, administrative burdens, and good, clean fun you can have by infiltrating your organization with *Windows* for Workgroups.

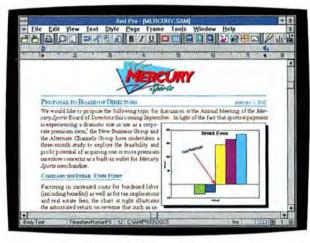
If you yearn for something less controversial than heterogeneous processors and politically incorrect networks, turn to "75 Hot Word Processing Tips." These sure-fire productivity boosters will shorten your workday without getting you into hot water. Contributing Editor George Campbell has rounded up tips for the DOS and Windows versions of WordPerfect and Microsoft Word as well as Ami Pro and WordStar. Naturally, he used all 75 of these tips to speed up the writing of the article. He finished it in record time.

Phil Lemmons, Editor in Chief

Compared to Lo Microsoft Office look



1-2-3 for Windows Release 1.1 now includes over 25 new features and usability enhancements.



Ami Pro 3.0 includes new features that make it more powerful and easier to use than Microsoft Word for Windows.

It's true. When you evaluate our complete solution for Windows™ desktops and then look at theirs, you'll see why ours is a better business choice.

Of course, both SmartSuite™ and Microsoft® Office include fullfeatured products. But SmartSuite has been recently updated to include 1-2-3° for Windows Release 1.1 with SmartPak™ and the newly released Ami Pro® 3.0, as well as Freelance Graphics® and cc:Mail.™

All four of these award-winning products share a common interface as well as our innovative SmartIcons.™



For a limited time, SmartSuite includes Lotus Organizer, the computerized way to keep tabs on all your daily tasks.

What's more, SmartSuite delivers some truly unique integration capabilities that aren't possible with Office. All four SmartSuite products,

for example, share data, text and graphs between each application smoothly and seamlessly. So when an outline produced in Ami Pro is imported to Freelance Graphics, it's automatically converted into a Freelance Graphics outline and full-slide presentation. And a 1-2-3 graph exported to Freelance Graphics will arrive, fully editable. Not so with Excel and PowerPoint.

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cc:Mail, the world's leading LAN-based e-mail system, allows you to send documents across all major networks and computing platforms.

applications just by clicking the icon of the application you want to open.

Better still, all SmartSuite applications are mail-enabled. So you can use cc:Mail to send "live" documents from within each application. Office, on the other hand, requires you to install and use an optional macro with Microsoft Mail 3.0.

Why is now the best time to buy Lotus SmartSuite instead of Microsoft Office?

For one thing, you just can't beat the total

value. In fact, for a limited time,* when you buy SmartSuite, we'll give you Lotus Organizer™ (a \$149 value**) absolutely free. It includes an on-screen calendar, to-do list, planner, address book, notepad and anniversary reminder that are all fully integrated. Plus if you're upgrading from any version of 1-2-3, Symphony,* any Lotus word processor or graphics product, or cc:Mail, you'll save even more. So do the smart thing. Visit your Lotus Authorized Reseller or call 1-800-872-3387, ext. 7354**** for a free demo disk.

Lotus

SmartSuite for Windows

1-2-3, Ami Pro, Freelance Graphics, and cc:Mail

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A Skeptic Rejoins the Flock, Software Gets Its Just Desserts

Doubt No More

Terrific! Awesome! I'm describing the November issue of *PC World*. As a subscriber for several years, I was beginning to think of the magazine as a marketing arm of Intel and Microsoft. But the November issue is without a doubt the best I've seen.

"Best Choice: 486DXs or Upgraded 486SXs?" helped me make the decision to buy a new 486 machine. Thanks. It made my subscription a real bargain. Theodore Platt, Wallingford, Connecticut

Your Data Doesn't Support Your Opinion

As sales and marketing manager for MIS Computer Systems, I'm concerned when one of our products receives less than a positive review. If constructive criticism is offered, I'll use the information to improve our product.

However, in the case of the November article "Best Choice: 486DXs or Upgraded 486SXs?" the data doesn't support the editorial opinion.

The MIS 486-50/33 ISA is midpriced, compared with the other 24 systems, even though it uses a more expensive SCSI disk subsystem and half of the other systems tested were 486SXs, which are usually less expensive.

All ten of the lower priced DX systems use a motherboard not from a leading supplier. MIS uses a Micronics board.

The Adaptec controller in the MIS system allows an additional six storage devices to be connected without the use of an expansion slot. This results in more expansion capacity than any of the other 24 systems, making the number of expansion slots a moot point. The MIS tower has nine drive bays to allow for this expansion. Three of the other systems have as many but can't use them. And MIS uses a larger power supply than most lower priced systems.

The conclusion that should have been reached is that while the MIS 486 DX/33 system is not as fast or inexpensive as some of the other 486DX/33 systems, it offers the most expansion and technical capability. And it's backed by excellent support and service.

Please ask the editors who evaluated these systems to install nine storage devices, 64MB of memory, a 256K cache, a fax-modem, and an ethernet card in each of the other 24 systems. From the data presented, the MIS is the only one that will provide this much value.

Emmett Smith, sales and marketing manager, MIS Computer Systems

Editor's response: Most of your points are well taken. Certainly a slower 486-33 is still a fast system, and, in fact, the MIS scored very well on *dBASE* compared with the other 486-33s. The overall expandability of the system is also good, especially because of the SCSI adapter and nine drive bays.

While the inclusion of a SCSI adapter is a benefit for those who plan to add SCSI devices, anyone can add a SCSI adapter to a system for a minimal cost. Furthermore, those systems with comparable numbers of drive bays had more available slots and prices from \$250 to over \$700 less. We should also point out that the motherboards used by all the less-expensive 486-33 systems in the review are also from leading suppliers or the system manufacturer.

Although the price of the MIS system was the major factor in its evaluation, many of its other features were on par with other 486-33s reviewed.

The Greatest Thing Since Ice Cream

Your November issue was one of the most informative yet. The credit goes to your shift toward a more real-life emphasis. I can't estimate the amount of money I've dropped for software on the basis of good ratings in magazines—only to find that I, a lay user, could get it to work only if I was already an expert in that kind of software.

In "Presentation Software Playoffs,"

your reviewer made a comment that succinctly portrays the weakness of most magazine reviews. "Blinded by its many features, we might have given Lotus's DOS product [Freelance Graphics for DOS] a decent rating. Our guest reviewers, though, weren't fooled. Sylvie Solard called it 'horrific,' adding 'I never want to touch it again.'"



I recall a program I purchased to fill out forms. It got great reviews and an editors' choice. The software did everything the hype and reviewers said it would, but no one mentioned how annoving it was to use.

I see that an upgrade to this program is available at a bargain price. Will I bite? Nah. Fool me once, shame on you. Fool me twice, shame on me. I'll wait till your guest review panel tells me it's the greatest thing since homemade ice cream.

James J. Fox, Juneau, Alaska

Editor's response: We are continuing to use guest review panels when we look at product categories in which ease of use is important. Take a look at the review of fax software in this issue.

Nerd Police

K udos on the new format unveiled in your November issue—it's well organized and presented. Your depth of



technospeak is right on the money. You should, however, go one step further by criticizing software vendors who foist unsatisfactory documentation off on customers.

Where is the force of your editorial police when it comes to documentation? Your staff has the expertise to work out the flaws; not all of us do. Vendors need to hire humans to complement the work of nerds.

John F. Brosnan, Jr., Raleigh, North Carolina

Dropped on Our Heads?

You must have been out of your minds to test multitasking operating systems on such obsolete equipment ["Windows Alternatives," October 1992]. The conclusions you drew don't follow from the tests you ran. It's one thing to see how well software runs on low-end equipment, but to conclude that OS/2 isn't up to scratch based on such a test is absurd. The 286 you tested, given today's market, is little more than a

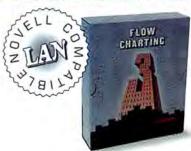
toy, and even the 386s you used are rapidly becoming obsolete. If you were really interested in assessing performance on low-end equipment, you would have used a 386DX-40 with 8+MB RAM and 486SXs with 8+MB RAM.

Your review says, "But OS/2's desktop is befuddling in its flexibility. For instance, you can move a file from a window of file icons... to another window containing program-launching icons.... As a result, it's not really clear where the file is—did you physically move it? And if so, where to?" Come on, people! Were you dropped on your heads too often as infants? If you're not capable of anything better than that, I don't think I'll be wasting any more time or money on your magazine.

R. E. Byers, Singapore

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CUBE Rebuts Its Review

am writing to express my surprise and dissatisfaction with the November review of the CUBE 433 ATX Upgradable system ["Best Choice: 486DXs or Upgraded 486-SXs?"]. CUBE believes that the observations regarding our system and its test results were inaccurate and damaging to our hard-earned reputation for producing highquality, high-performance systems.

The CUBE 433 ATX is a fast, Windowsoriented system. Its standard video board is the Orchid Fahrenheit 1280 graphics accelerator with 1MB of VRAM. I asked how the CUBE could do so poorly with its high-performance components and was dismayed to learn that PC World uses benchmark tests designed around Windows 3.0. Had you told us that your testing procedures were so far behind the times and allowed us to opt out of the review, we surely would have.

PC World commented that the CUBE system is fairly expensive, which is true. However, no mention was made that you get an outstanding Lexmark keyboard or a Sony Trinitron monitor—both of which have won industry awards and are representative of the highest quality, most reliable products around.

CUBE consistently offers the highest quality systems, reasonable high-end performance, and an attractive overall package for users who want long-term reliability and daily satisfaction from their system. Not everyone is interested in price; most people today are interested in value. We know

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On Your Taxes?



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But now, using TurboTax and your personal computer, you can avoid these simple but costly mistakes:

The Arithmetic Error

Today, even the simplest forms contain complex calculations. And with all the late-night scrambling, an innocent mistake could cost you plenty.

The Transcription Error With all those numbers being juggled from schedule to schedule, it's no wonder the figures are so often transcribed incorrectly or entered on the wrong line.

The Omitted Form Even "ordinary" returns require anywhere from six to a dozen forms to complete. It's easy to miss one ... or end up rushing all over town to find the one you need.

The Misinterpreted Instruction At best, IRS instructions can be tough to understand. At worst they can be mind-boggling. What you need are clear directions in plain English.

The Overlooked Deduction You'd have to be a professional tax preparer to know all the deductions vou're entitled to. If you miss just one, it could cost you hundreds of dollars.

The Exceeded Guideline The fastest way to trigger an IRS audit is to exceed the "normal" range on one of your deductions. You need to know what the IRS looks for on a line-by-line basis.

When you do your taxes with TurboTax, mistakes like these are virtually impossible. And filing your taxes couldn't be easier.



Tax Software

TurboTax is America's #1 best-selling tax software -- over seven million returns were filed with TurboTax last year! With TurboTax on your PC (or MacInTax on your Macintosh) and the new EasyStep™ tax preparation process, you can completely and accurately prepare your income taxes in just a few hours.

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- B. Enter your data into TurboTax.
- C. Print out, sign and drop in the mail.

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MAGAZINE EDITORS

Then TurboTax makes all the calculations, checks for accuracy and consistency, and transfers every number to the proper lines on the proper forms. And, TurboTax prints every form you need in IRSapproved format right on your own printer -ready to sign and mail (or file electronically, if you

prefer, for a faster refund).

PC Magazine says TurboTax "makes doing your taxes almost fun." Try it for yourself. We know that if you try it, you'll never go back to doing your taxes the old-fashioned way. In fact, we back TurboTax with our Double Guarantee:

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Michael Barr, vice president,

CUBE Computer Corporation

Editor's response: While our readers find significant value in long-term reliability, we can't assess this quality in new systems. Our reviews take place over a period of months, and long-term reliability must be measured in years. It's true we made no mention of the high-quality components used in the CUBE system, and we regret that.

Our previous benchmark tests did include a component based on *Windows 3.0*—as did some tests used by other magazines at that time—but we now have developed a state-of-the-art test based around *Windows 3.1* that has been used in our reviews since January 1993. Despite the use of the *Windows 3.0* test in the November review, the results are still valid in that the relative performance of systems is measured. The CUBE system finished in the bottom five systems overall.

Almost all the systems reviewed used some form of graphics accelerator board, so the use of an Orchid Fahrenheit 1280 in the CUBE system did not make it stand out. We stand by our conclusions regarding performance and price on the CUBE system.

Utopia Gets a Dose of Realism

How unfortunate that PC World faults document imaging in a single stroke because it fails to live up to an editor's dream [see the sidebar "Searching for Utopia" in "The Less-Paper Office" in October]. Imaging is a proven and increasingly popular technology. Software vendor Keyfile was up front about its product being sold strictly through VARs (value-added retailers) with the experience to tie multiple technologies together. Enlisting the support of such a VAR would have brought a dose of reality to your experiment.

Then there is the \$42,358 shopping list. Why calculate the cost of imaging so that it carries the cost of PCs, hard disks, network cards, a laser printer, and even Windows? I don't recall that arithmetic being done with spreadsheets and word processors. And by the way, today a Xionics image accelerator

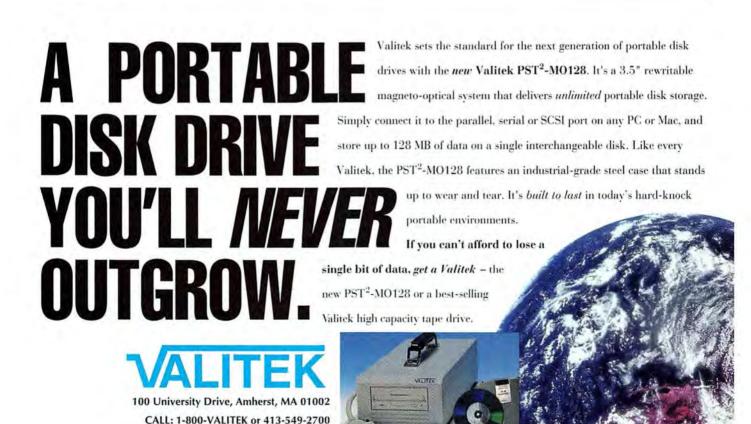
card for this system would cost less than \$2000, not the \$4850 of a year ago.

Finally there is the review by innuendo. Why talk about "strained" system performance without mentioning numbers? Where is the comparison of hours spent filing, retrieving, photocopying, and losing documents in a paper system versus one-time scanning and indexing for fast shared access to images in an electronic system?

PC-based document imaging is the fastest growing segment of the multibillion dollar electronic-imaging industry. Xionics continues to achieve double-digit growth selling image accelerator cards to OEMs, VARs, integrators, and even technically savvy users. How about looking at document imaging in the real world?

Brian Bissett, vice president, marketing, Xionics

Editor's response: The purpose of our sidebar was to look at document imaging in the real world by attempting to reduce the use of paper in our own office. We hired an expert with VAR experience to set up the system. Our expensive shopping list was



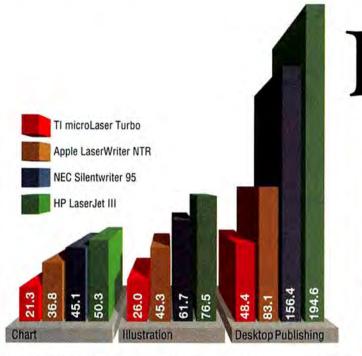
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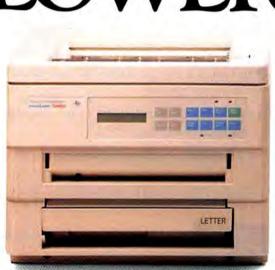
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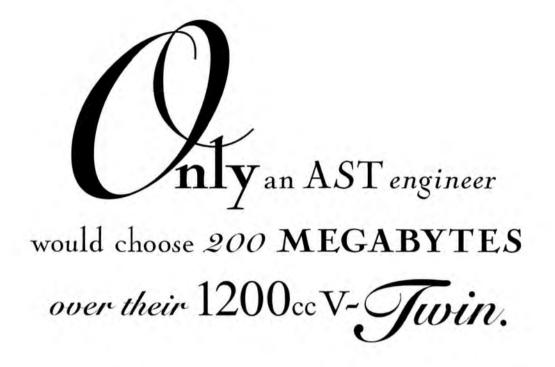




MacUser ***

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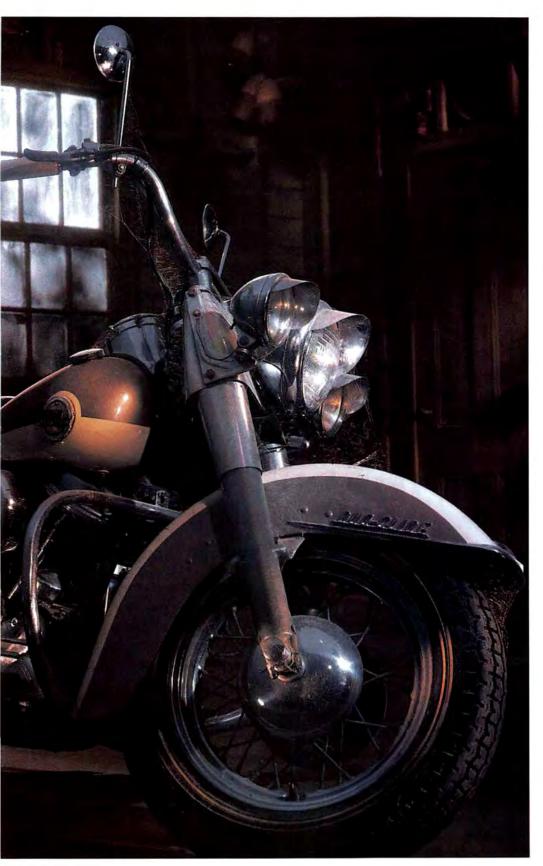
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dictated by the volume of material we anticipated cataloging and managing. Quite simply, our current network—while adequate for E-mail and file sharing, and while more sophisticated than many—was not up to the task. Nor was there such a thing, in our experience, as "one-time" scanning.

There are numerous solutions to the document imaging conundrum, and they offer varying degrees of usability and cost. Document imaging has the potential to become the solution we are all awaiting, and we'll continue to examine the issue in the months ahead.

Corrections and Clarifications

B ecause we misplaced a fact-checking file, there were some errors in the Features Comparison in the December review "Best Monitors for \$1000."

The list price for the Amdek AM/815 is \$799, and this monitor does not meet SWE-DAC emissions standards.

Daily support for Dell's 15LR is 18 hours. The HP Ultra VGA 17-inch Display does manually degauss, HP has fax support, and HP doesn't have a turnaround policy.

The NEC MultiSync 4FG has a control to correct pincushion/barrel convergence.

The list price for the Relisys RE1558 is \$845, and it has a 12-month warranty and a turnaround policy of five working days.

The turnaround policy for the Samsung SyncMaster 5c is seven days.

The Taxan Multivision 550 has daily support 8 hours a day, and its turnaround policy is five to seven working days.

Electronic BBS support is available for the ViewSonic 7.

In "Fast Video for Less" in December, we listed an incorrect phone number for Young MicroSystems. The correct phone number is 310/941-9888.

In December's "486SX-25s vs. 386DX-40s: The Upstart Fights Back," the contact listed for the Tangent Model 340 was incorrect. For information about the Tangent, call 800/800-6060 or 415/342-9388.

In December's "The Readers' Choice: World Class 1992," we misspelled the photographer's name in the credit on page 118. His name is Richard Loper. In December's Real Problems, Real Solutions, we misspelled our guest problem-solver's name: It is Howard Moskowitz, with a k, not a c.

In December's New Products, we listed an incorrect price and model number for the Quick Take item on Adaptec's SCSI Master Plus. Its price is \$466, and its model number is AHA-1524.

Due to an editing error, a January Top of the News article on Microsoft incorrectly cited the Software Publishing Association as the source for information concerning the percentage of Windows software sold by Microsoft. The SPA does not release this information; the figure was obtained from an analyst.

PC World regrets the errors.

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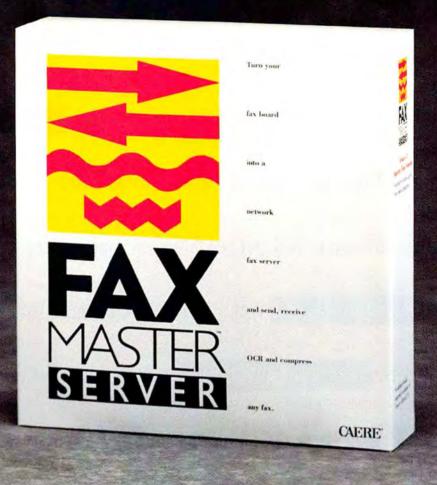
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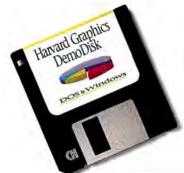
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In Search of Relief for Tired, Aching Eyes

ccording to a recent survey of U.S. optometrists, an estimated 10 million Americans visit eve specialists each year for VDTrelated vision problems, or what one glare-filter manufacturer has termed computer vision syndrome (CVS). "Vision problems are the most frequently occurring health problem among VDT workers," says Dr. James Sheedy, associate clinical professor of optometry at the University of California at Berkeley's School of Optometry and chief of the university's VDT Eve Clinic, dedicated exclusively to the study and treatment of VDT-related eye problems.

Any type of close-up work that entails staring at a fixed point for hours takes its toll on your eyes. But, says Sheedy, "VDT work is particularly demanding." Students poring over textbooks and drafters working on a design can change positions periodically for optimum comfort and lighting. The PC user doesn't have that option. For the majority of us, the monitor stays in one spot at a fixed distance from the eyes, presenting such unique irritants as glare and flicker.

When Eyes Fail You

Eyestrain, headaches, blurred vision, and dry or irritated eyes are the most common side effects of extended VDT work, according to Sheedy's survey of members of the American Optometric Association. Doctors responding to the survey said that for nearly 40 percent of their VDT-using patients, vision problems were the direct result of "environmental factors, such as lighting, poor screen resolution, glare, etc." To that list Sheedy adds such contributing factors as poor workstation design and extended hours of uninterrupted computer use.

Flicker can also be a significant cause of eye fatigue among computer users.

by Roberta Furger

Most monitors repaint the screen 60 times per second (60 Hz)-generally considered the minimum acceptable refresh rate. Many users argue. however, that even this level produces a noticeable flicker-and subsequent evestrain. For this reason, most new video boards and monitors support at least 70-Hz refresh rates. (If monitor flicker bothers you, check the specs on your monitor and graphics board. If you're lucky, they may already be able to do 70 Hz or better, and a simple set-

up change can produce a more stable image. Otherwise, consider upgrading to a graphics board and monitor that support higher refresh rates.)

In extreme cases—like many types of extended close-up work—extended VDT use can bring on myopia or near-sightedness, which can be helped only with prescription lenses. Fortunately, current research indicates that most VDT-related vision problems are short-term and can be alleviated or reduced by a change in work habits and office setup, and in some cases by obtaining a prescription for corrective lenses that you can wear while working at your computer.

Sheedy and others also recommend routine eye examinations for anyone who uses a computer regularly. When possible, see an eye specialist who is familiar with VDT-related problems and make sure you provide your doctor with a detailed description of your job and your work environment.

See "Not for Your Eyes Only" for a commonsense list of things you can do to ease eye strain. Often, something as simple as changing the position of your monitor or reducing office lighting can go a long way toward alleviating VDTrelated vision problems. But not everyone has the freedom to make some of

PC World Consumer
Watch editor
Roberta Furger

the recommended adjustments. In these instances, says Dr. Stephen Miller, director of the American Optometric Association's Clinical Care Center in St. Louis, a glare filter can be a simple and effective way to fight eye fatigue. Not only do these filters reduce eyeball-bending glare, some also claim to make flicker less perceptible.

Quick and Easy Glare Reduction

Glare filters come in three basic varieties: mesh, glass, and plastic. All filters darken the screen, but glass and plastic units usually make up for it with enhanced contrast. Most eye specialists recommend glass filters, since they tend to distort the image far less than mesh varieties, which can produce a moiré pattern on screen, an interference pattern that Sheedy refers to as "the screen door effect." Glass and plastic filters have two drawbacks, though:



They're more expensive and more reflective than mesh—so in extreme lighting, the filter may produce more reflections than the naked monitor. Casual users, people who don't want to spend much for a product, or users in harsh lighting conditions should consider mesh.

The only way to know if a filter will meet your needs is to work with it on your computer for a few days. To help consumers make a more educated decision, the American Optometric Association began a Seal of Certification and Acceptance program to judge the effectiveness of filters. To date, only one company, Optical Coating Laboratory, Incorporated, has submitted its products for review. All the OCLI filters have received the AOA seal.

Virtually every filter manufacturer offers both mesh and glass products. Along with reducing glare, some filters are supposed to cut static, which means they prevent charged dust particles from collecting on the surface of the monitor. Others claim to block potentially harmful electromagnetic emissions. We didn't measure emissions levels here, if only because these filters cannot block rays from the back of monitors—the greatest source of low-frequency emissions.

To measure the effectiveness of glare

filters, we had 12 PC World editors—a demanding group, because they often spend hours hunched over their monitors—use a filter for a month and then report on their experiences. A few of the editors had used glare filters previously, but none had a unit installed at the beginning of the study. The lighting

in our offices varies considerably from one cubicle to the next. We have fluorescent lighting overhead and windows stretching along the exterior walls of the

building. Each cubicle is also equipped with task lighting.

Most of the editors reported reduced glare and, in many cases, reduced eye fatigue after installing their filters. "With the filter installed, I can work on my system all day with virtually no eyestrain and without having to position the monitor away from the sun's path," notes Assistant Managing Editor Anne Kandra.

And you couldn't ask for easier products to install. "My first impression of the instructions was that they were inadequate," says Associate Editor Lincoln Spector. "But the filter turned out to be so easy to install that it didn't matter." Filters come in three basic designs: They attach directly to the front of your monitor, hang from the top, or fit like a glove over the bezel. The latter, socalled contour models, may be the best choice if you have a monitor with a curved bezel, because they can block light coming in from the sides.

Our evaluators also pointed to some common problems with the products,

"After installing the glare filter, my screen immediately looked flatter and darker, as if I were wearing sunglasses."

particularly their noticeable darkening of the screen. "Immediately my screen looked flatter and darker, as if I were wearing sunglasses," said Assistant Editor Christina Wood, after installing a filter on her NEC MultiSync II monitor. While making the adjustment was difficult at first for a few editors, most of them felt they could live with the results simply by adjusting the monitor's brightness and contrast.

Prices vary considerably among the filters we evaluated—from \$28.50 to \$140. Except for a few extreme cases (where individuals sit adjacent to large windows, for example), low-price units seemed to be as effective as their more expensive counterparts. And regardless of what type of filter they installed—

A Filter for Every Monitor



OCLI'S GLARE GUARD Professional Plus's contour design fits snugly over the monitor. For units with curved bezels, this design is most effective at blocking outside light.



THE KANTEK ERGOVISION2 mesh filter's front-mounting design can attach to the face of the monitor or on top. The grounding wire provides antistatic protection.



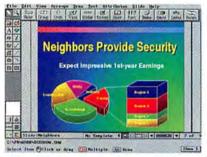
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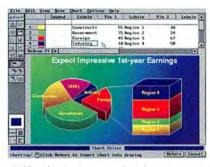
much like Windows as DOS gets. Even industry leader Harvard Graphics for DOS doesn't look as graphical or as slick." *PC Computing* (12/92) raves that Presentations "outdoes most Windows programs not only in the

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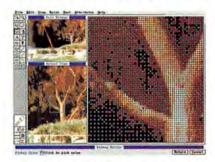
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why the most powerful upgrade ever to Harvard or any graphics package could only come from WordPerfect.

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Not for Your Eyes Only

Many eye problems related to VDT use can be alleviated by a few commonsense adjustments to your workstation and work habits. Following are several guidelines that can help you make screen work easier on your eyes:

- . Check for flicker. Flicker can be one of the primary causes of eye fatigue. If you notice a flicker on your display, you may need to upgrade your graphics card or monitor to support a higher refresh rate. (The PC graphics community recommends using a monitor with a minimum refresh rate of 70 Hz.)
- · Adjust the height at which your monitor sits. For optimum comfort and minimum strain, adjust your monitor's position so the top of the screen is at eve level.
- Keep your distance. The most comfortable viewing distance varies, but eye care specialists generally recommend sitting 18 to 24 inches away from the screen. If you need to sit closer to see the text, visit your eye doctor; you may need special VDT glasses.
- . Control harsh lighting. Position your monitor so light hits it from an angle. Avoid having any direct light source (such as a lamp or window) either behind you as you're looking at the screen or directly behind the monitor itself. When possible, reduce overhead lighting by either turning off some lights or removing every other bulb from fluorescent light fixtures.
- Don't go overboard on resolution. Running your monitor at higher resolutions (particularly 1024 by 768 on standard 14-inch screens) makes for extremely small type that can be difficult to read. Consider dropping your monitor's resolution down a notch to allow easier reading.
- Take regular breaks. Eye specialists recommend taking a 5- or 10-minute break after every 2 hours of continuous computer use. Do some paperwork, take a walk, and give your eyes a chance to focus on distant objects. The time away from your desk will do your eyes-and your blood pressure-some good.

mesh or glass, inexpensive or priceythe editors haven't offered to give back their demo units. With this bunch, that's probably the strongest recommendation of all.

The following companies offer antiglare products for a range of PC monitors. While most sell filters, others offer less standard models, such as a visor that wraps around the monitor or filters that install behind the bezel.

- Advanced Environmental Systems;
- 415/626-1625

Reader service no. 697

Ergotech; 800/729-1345

Reader service no. 698

- ErgoView Technologies; 800/888-3537 Reader service no. 699
- Fellowes Manufacturing; 800/945-4545, 708/893-1718 (fax)

Reader service no. 700

- Kantek; 800/536-3212, 516/593-3212 Reader service no. 701
- I-Protect; 800/733-2537, 310/215-1664 Reader service no. 702
- NoRad; 800/262-3260

Reader service no. 703

 Optical Coating Laboratories, Inc.; 800/545-6254

Reader service no. 704

Polaroid Corp.; 617/446-4600 (fax)

Reader service no. 705

Sunflex; 408/522-8850

Reader service no. 706

PC World staff members Michael Desmond, Thomas Gewecke, Mike Hogan, Anne Kandra, Karl Koessel, Richard Melville, Shane Rau, Melissa Riofrio, Susan Silvius, Lincoln Spector, and Christina Wood contributed to this article.

Shop Talk

By Any Other Name . . .

was considering purchasing a 486DX-33 from FastMicro, but after your comments in "Readers Rate Direct-Sale Vendors" and the review "Best Choice: 486DXs or Upgraded 486SXs?" in the November 1992 issue, I am not inclined toward this vendor. I wrote to FastMicro asking for additional information, but they didn't respond.

There is a very similar system by a company called RiteMicro, also in Phoenix. Their advertisements say they have been in business for six years, but I can't find any of their previous advertisements. Can you tell me anything about them?

Evan L. Davis, Jr., Issaquah, Washington

Editor's response: RiteMicro is a subsidiary of FastMicro, a company that has been the subject of dozens of letters to Consumer Watch over the past year and for which we continue to receive complaints. We have also received

numerous inquiries and a handful of complaints about RiteMicro since it began advertising in PC World late last year. As with FastMicro, these complaints have dealt with customer service-related problems.

Although we have forwarded letters about RiteMicro to FastMicro for resolution, the company has not responded to any of them. And although salespeople at both companies have explained their relationship without hesitation, we have been unable to get a formal response from FastMicro executives.

The Better Business Bureau in Phoenix (the city in which both Fast-Micro and RiteMicro are located), gives both companies an unsatisfactory rating and does not condone or recommend purchasing from them due to unresolved complaints, according to a spokesperson.

Effective with the January 1993 issue, neither RiteMicro nor FastMicro advertises in PC World.

Down, But Not Out of Touch

When I read about Wang Laboratories filing Chapter 11 bankruptey last year, I was concerned that I might run into trouble when I needed customer service assistance or warranty coverage. In fact, just the opposite was true. When I wrote to the customer service

Introducing Graphics Works for Windows!

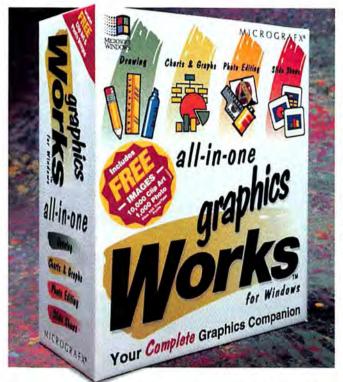
The first easy, affordable way to do it all yourself.



Produce dazzling drawings and desktop publishing!

Easily do your own illustrations or use any of over 11,000 images included free to jazz up everything you produce!





Create gorgeous graphs and charts! Quickly create bar graphs,

organization charts, pie charts and more, complete with photo images, clip art and 3-D effects!

Over 11,000 editable images included free! images are included. Customize

Over 11,000 photo and clip art them for desktop publishing, presentations, etc.



Have a field day with photo images!

Choose from photo images included with Graphics Works, or scan in your own. Then retouch them right on your PC!



or less than you'd pay for a one-function graphics package, now you can get the Works!

New Graphics Works for Windows is the first graphics software that makes all your graphics projects fast, fun and easy. From presentations to

invitations, publications to posters, layouts to logos.

You can produce your

own artwork with easy-to-use drawing tools. Or choose from over 10,000 professionally-drawn clip art

images included free.

You'll have a field day with photo images. Retouching them right on your PC screen, then adding them to everything you produce. Choose from over 1,000 photo images included, or scan in your own.

You'll also be able to create dazzling charts and graphs. Complete with clip art, photos, special effects and more.

And best of all, everything's integrated to work the same, easy way. You'll enjoy 24-hour telephone support too. It's just what you'd expect from the leader in Windows graphics.

So experience graphics the way they were meant to be. Exciting. Easy. And affordable. Get Graphics Works for Windows today!

1-800-758-1612

CROGRAF

Since the mid-1980's, ALR has been the PC manufacturer of choice among both leading edge power users and budget conscious consumers. Time and again, we've revolutionized the PC industry with our advanced designs and affordable prices. This ability to expertly balance performance with value has earned us top honors worldwide, including PC/Computing's "Most Valuable Product (MVP)" Award. CHIP Magazine's "Computer of the Year" (Germany), Computerwelt's "Computer of the Year" (Austria) and various "Editor's Choice" awards.

To make certain that every ALR system keeps performing like a winner, we've created a service and support program that PC World described as being "among the best." A six-day-a-week, tollfree tech support hotline provides instant solutions to most problems, while our extensive on-site service program (available for as little as \$9.95* a year) delivers both convenience and security. We even cover selected models with a 30-day money back guarantee**, so you know you can buy with complete confidence!



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In Canada Call: 800-465-5979

* Standard price for two-day on-site service. Some restrictions apply; call ALR for details. **Available only on ALR FLYER SC and ALR FLYER SD systems purchased through ALR PrimeLine

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33-MHz i386SX

Communiced to beat AST COMPAQ. Dell and Gateway Drices

30 Day Money Back GUARANTEE



THE ALL NEW ALR FLYER SC 33-MHz i3865X 2-MB MEMORY **FAST SUPER VGA** MS-DOS 5.0 WINDOWS 3.11M AN ALR MOUSE MONITOR OPTIONAL



One Year On-site Service for as little as \$9.95

The ALR FLYER SC

Sure, there are plenty of low cost PCs out there, but only one that performs like the ALR FLYER SC. For the same price as the Compaq ProLinea zsim, the ALR FLYER SC gives you 32% faster processing, 100% more hard disk capacity, plus MS-DOS, Windows 3.1, and an ALR Mouse!

And ALR gives you something else Compag doesn't -- the future. The ALR FLYER SC provides an upgrade path to i486SX processing. Or you can plug in a performance boosting memory cache.

> Either way, you know your investment is protected -- a comfort you won't find with other low cost PCs.

ALR Quality: Built into every system, from entry-level to multiprocessing

All Major Credit Cards Accepted



Call Now Toll-Free ALR PrimeLine Direct



monitor optional, 1024 x 768 28mm \$299

ALR FLYER SD 4/25s

- Intel* 4868X1025-MHz
- 80-MB Hard Drive
- Intel's Overdrive support
- Intergrated Super VGA
- 3 Drive Bays, 3 Expansion Slots

150% Higher iCOMP™ CPU Performance Rating Priced \$100 less than Dell Dimension™ 386SX/25

Available with a 170-MB hard drive for only \$1,099. Includes MS-DOS, Windows 3.1, an ALR Mouse

NEW 4SX33 \$1459



mitor optional, 1024 x 768 .28mm \$299

ALR FLYER SD32 4/33

- 33-MH: Intel 486 DX
- 170-MB Hard Drive
- 1-MB Video Ram
- 256K Cache (optional)
- I/O Enhancement Slot

100% More Video RAM 42% More Storage Priced 32% less than Compaq Deskpro™ 4/33i

Includes MS-DOS, Windows 3.1, an ALR Mouse Intel's Overdrive Support to 66MHz



monitor optional, 1024 x 768 28mm \$299

ALR BusinessVEISA 4/66d

- 66-MH: Intel 486 DX
- 170-MB Hard Drive
- WinMarks 16.28
- Maximum RAM 52-MB
- 1-MB Video RAM

Offers 23% Better Video Performance than the AST PowerPremium® 4/66d™

PC Magazine WinBench 2.5

Includes MS-DOS, Windows 3.1, an ALR Mouse



monitor optional, 1024 x 768 .28mm \$299

ALR PROVEISA 4/33

- 33-MH: Intel* 486"DX"
- 340-MB Hard Drive
- 12 Drive Bays
- 10 Expansion Slots
- Dual Processor Ready

42% More Storage & Slot Space **Dual Processing Capability** Priced \$500 less than Compaq ProSignia™

Selected models include ALR's new patent pending, "MULTUS" controller. This breakthrough in drive technology promises SCSI like performance with the use of an inexpensive controller and IDE drives



ALR Ranger MC 4/20s

- 20-MHz Intel 486 SX
- 80-MB Hard Drive
- Upgradeable CPU
- Docking Station Available
- Free Microsoft PS/2 BallPoint 15th Mouse* * While Supplies Last

100% Faster Performance Priced \$300 less than Toshiba®1850C

ALR Ranger MCT 4/25s Active Matrix (TFT) models starting at \$3,795.

CONSUMER WATCH

manager about a problem I was having, I received a prompt response and exceptional service.

Your column all too often reflects the ripoffs that are happening. I thought it would be nice for the public to know that they can still depend on the older, well-established companies even in times of adversity. Emanuel Wolin, Margate, Florida

Cash Discounts: Not Worth the Risk

n response to an advertisement, I called A-Tronic Computer in City of Industry, California, to ask about a 486-50. The salesperson offered me a discount if I paid cash, so I sent a cashier's check for \$1559.

I received a postcard confirming the order and ship date. The ship date came and went, so I called to speak to the salesperson who took my order. I was told he was on the phone and would call me back. He didn't.

I called again repeatedly, only to get a busy signal. Finally I got a recording telling me the phone number had been disconnected. How can I get my money back?

Jane F. Powell, Baltimore, Maryland

Editor's response: Unfortunately, you probably won't be able to recover the money you sent A-Tronic. According to sources, the building where the company operated is vacant, and at least one creditor is owed several thousand dollars. Although the Postal Service lists a forwarding address in Fort Lauderdale, Florida, directory assistance has no number for an A-Tronic Computer in that city.

To date, the Federal Bankruptcy Court in Los Angeles has no record of the firm having filed for bankruptcy.

Cash discounts, such as the one offered by A-Tronic, can be enticing because they often mean a savings of several hundred dollars. But such deals are used frequently by companies looking for a quick infusion of cash—either to buy the equipment necessary to fill orders or to get out of town fast. Better to pay the full price using a credit card or COD. That way, if something goes wrong, you'll be out your time but you won't be out your money.

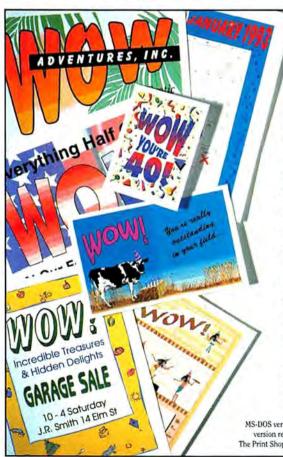
One final note: A-Tronic Computer is not affiliated with ATronics Int'l in Fremont, California, whose computer received a PC World Best Buy in the January 1992 issue.

Prodigy Billing Practices Questioned

n June 1991 I decided to get a one-year membership to Prodigy. Prodigy's credit-card plan stipulated that unless the member advised otherwise, the membership would be renewed automatically. Wishing to use my credit card, but not wanting my membership to be automatically renewed, I sent Prodigy's customer service department an E-mail message asking them to sign me up for a one-year membership, but not to renew it unless I requested they do so.

In June 1992 I sent another message to Prodigy inquiring about the status of my membership and reminding the company that I did not want it renewed automatically. I was told that the membership had already been renewed, but that I could receive a refund if I requested it.

The most disturbing aspect of this misunderstanding was that the credit card I used when I opened my Prodigy account is linked to my checking account. Bills are



HOW TO WOW Introducing The Print Shop Deluxe

Are your communications more bowwow than wow? Then the time is now to try out our new program, The Print Shop® Deluxe.

With it, you'll soon be wowing colleagues and kin alike with great greeting cards, letterhead, signs, banners, calendars and more—all without any art school know-how. Because The Print Shop Deluxe comes complete

with hundreds of custom-made layouts, 30 different fonts and over 300 eye-catching graphics—most in living color.

So stop by your software dealer. Or order directly and we'll give you The Print Shop Deluxe for \$59.95—that's 25% off our regular price of \$79.95. And we'll also include a FREE Celebrations Graphics Folio with 100 additional graphics.

To wow now, call 1-800-685-8553 Code 212, 24 Hours a Day, 7 Days a Week



Broderbund

MS-DOS version requires an 80386SX, 80386 or greater microprocessor, a hard disk, 1MB of RAM and a VGA video card. The Windows^{1M} version requires Windows 3.1, an 80286 or greater microprocessor, 2MB of RAM (4MB recommended), a VGA video card and a mouse.

The Print Shop and Broderbund are registered trademarks of Broderbund Software, Inc. Windows is a trademark of Microsoft Corporation.

THE DIRECT RESTRICTED PROA

für Litt Vew Beturde Graige Chiette Syde

With Approach for Windows:

Data Entry Form

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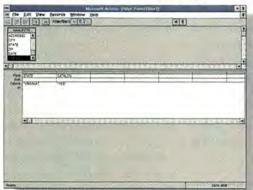
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With Approach for Windows simply: 1) Choose "Options" under "Field Definition". 2) Check "Filled in".

(Catalog



With Access, to find all Virginia suppliers in your catalog:
1) Choose Filter/Sort. A different screen appears, placing you in Filter mode.
2) Indicate the field you wish to filter on by dragging "STATE" into the table.

3) Type "VA" to enter your 'criteria'.
4) Indicate the second field you wish to filter on by dragging "CATALOG" into the table.

5) Type "yes" to enter your criteria".

6) Click the Filter/Sort button. Results appear, but with no info on the number of records.



With Access, to require that the zip code field always be filled in:

With Access, to require that the zip code held always be filled in:

1) Create a new macro.

2) Click the Conditions button to display conditions.

3) Type "[Zip] Is Null". Tab to Action and enter "MsgBox".

4) Type an ellipsis (...) for the next Condition and enter "CancelEvent" under Action.

5) Type another ellipsis and "GotoControl". Type "Zip" for your 'Action Argument'.

6) Correct any syntax errors and save your macro.

7) Go to the form which includes the "control" that requires filling in. Obtain its properties.

8) Click in BeforeUpdate and enter the macro's name

Why struggle with a complex database program like Access™ when there's a direct approach that requires no programming? Award-winning Approach™ for Windows™ is the complete database package that puts more easy-to-use, relational

power into projects you need to complete today! Everything you do in Approach is centered on familiar paper items: reports, forms, form letters or mailing labels. Which lets you work with the same simplicity you enjoy in a paper environment. That's why PC Computing stated "If you're looking for ease of use, nothing beats Approach... This is four-

star software."

And whereas programmers may enjoy poring through all 543 pages of the Access 'Language Reference' manual, Windows Magazine wrote

"Approach is one of the few software packages where it is truly possible to never open the manuals."

All this ease-of-use doesn't come at the expense of power, however. That's why Approach for Windows also received a perfect 5.0 in both 'ease of use' and 'performance' in a recent *PC Week* Labs review.

From novice to power-user, Approach for Windows is ideal for creating and managing contact lists, projects, budgets, order entry and more.

With Approach, access to existing databases is always only a mouse click away. Our PowerKey** Technology works with dBASE, Paradox, FoxPro, Oracle SQL, SQL Server and DB2 data in its native format. This lets you transparently share data across multiple databases, and across all

popular networks with unsurpassed speed and flexibility.

1) Choose Find for a blank form identical to the one you're using.
2) Choose "VA" from the pull-down list and click on "Catalog".
3) Hit Enter. Results appear with a note on the total number of Virginia suppliers.

Why wrestle with a restrictive database like Access that InfoWorld said "will stymie the average user"? For database power you can really use, order Approach for Windows today.

Approac









To order, call your local dealer or 1-800-APPROACH

* Suggested retail price is \$890. Competitive upgrade offer available to owners of Access, ObjectVision, dBASE, Paradex, FoaPre, Alpha, SuperBase, Data Ease, Q&A, r. Base, DataPerfect, DataPer, or File-Maker. Offer expires March 31, 1903. 6 1902 Approach Software Corporation, 311 Penobscot Drive, Redwood City, CA 94063, Tel. (415) 306-7890. Fax (415) 306-5182. All rights reserved, Approach and Fowerkey are trademarks of Approach Software Corporation. Access and Windows are trademarks of Microsoft Corp. Other product names mentioned are registered trademarks of trademarks of their respective holders.

CONSUMER WATCH

debited directly, so Prodigy was able to remove more than \$120 from my checking account without my knowledge or consent.

Although I have not signed on to Prodigy since June when my account was fully paid, I am now receiving bills advising me that my account is overdue.

Warren Schlam, Rome, New York

Editor's response: According to Prodigy Communications Manager Brian Ek, Schlam's billing error has been corrected. He notes that Prodigy continues to issue charges for service unless the member cancels. "Members can discontinue service at any time, regardless of term, and receive a refund of any unused portion," he adds.

Think you've gotten a raw deal—or a great one? Mail the details to Consumer Watch, PC World, 501 Second St. #600, San Francisco, CA 94017; or send them electronically to PC World Online, Consumer Watch; MCI Mail, PC World Editorial; CompuServe, 74055,412; or 415/442-1891 (fax). We'll investigate complaints and publish letters with the broadest interest.



BUG WATCH

CompuAdd Notebooks

Internal modems In some CompuAdd 325tfx and 425tfx notebooks won't work when peripherals are attached to the PC.

Until CompuAdd can make a fix available to users, the company advises anyone who owns either of these models and is experiencing problems with their internal modem to disconnect all peripheral cables from the notebook before attempting to use the modem.

CompuAdd: 800/999-9901

Grammatik 5 and WordPerfect 5.1

An intermittent bug in the Bookmark feature of Grammatik 5 for DOS can destroy portions of WordPerfect for DOS 5.1 files. When you remove a Grammatik bookmark from a WordPerfect 5.1 file, text following the bookmark may be lost.

A fix is available free from Reference

Software, maker of *Grammatik*. If a document has been corrupted by the bug, check the *Grammatik* directory for a back-up of the file (*.GBK), created automatically at the start of each editing session.

Reference Software Int'l; 415/541-0226

ATI Mach32 Video Driver

Conflicts between the recently released Mach32 driver for ATI's Ultra Pro local bus video board and the HP DeskJet printer can cause incomplete print jobs and missing text if you're using TrueType fonts.

ATI will include a fix in the next version of the driver, though a company spokesperson could not give a delivery date.

ATI; 416/756-0718 (Ontario, Canada)

-Richard Melville

Richard Melville is an editorial intern. Have you run into a software bug or hardware incompatibility? Call us at 415/978-3253 with the details. We'll investigate problems and report on those of broadest interest.

CPUs/Servers

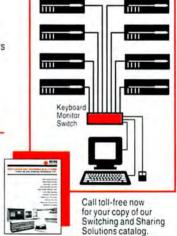
Your Choice of Keyboard Monitor Switches

Access multiple computers with a single keyboard and monitor to cut equipment costs, save valuable space, and end clutter



Manually controlled unit

- Simple pushbutton operation for quick selection
- Four, eight, or twelve ports per unit
- Daisy-chaining connects unlimited number of CPUs
- Compatible with EGA, VGA, Macintosh, Sun, and others
- Optional keyboard booting for 286, 386, and 486
- Optional RS232 or PS/2 mouse interface
- PCB construction for high reliability and low crosstalk
- Rack mount, matrix, and customized units available



Typical Application

Other Rose products: Print servers, printer sharing units print buffers, keyboard monitor extenders, video splitters All Rose products are US made and have a Lypar warranty

- Switch by keystroke, from front panel, or RS232 port
- Two or four ports per unit
- Cascade units to support up to 255 CPUs
- Supports monochrome, EGA, and VGA
- Includes keyboard booting for 286, 386, and 486
- Includes RS232 and PS/2 mouse interface
- LEDs display selected CPU and CPU power-on
- Scan function switches among CPUs automatically

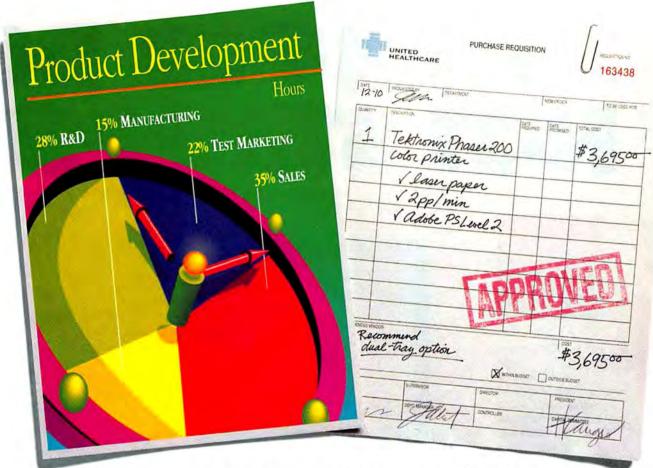


Keyboard controlled unit

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Our new color printer not only looks great on paper, it looks great on paper.

True, the brilliant color produced by the new Tektronix Phaser* 200 is captivating. But the price is equally attractive. And though we've become the award-winning leader in color printers by frequently outdoing the

competition, this time we've even outdone ourselves. Introducing our newest business work group color printer.



The eye when it sees black and white.



The Phaser 200 is compatible with virtually any business software and can print two colorful pages per minute. No, not two minutes per page—two pages per minute. And even at a speed like that, it still manages to print eye-catching color on common laser paper or transparencies using a separate input tray for each. You select the medium you want at your computer keyboard. And it switches automatically from user to user just as easily, using its parallel, serial, AppleTalk,™ or optional EtherTalk™ and Ethernet™ ports.

It has all the advantages of a laser printer. True Adobe PostScript™ Level 2, networkability, Pantone® colors, speed and price. (Did you notice it's only \$3695, slightly below unheard of?) And when you add to that extremely high materials capacity and sparkling TekColor™ output—not just any color, but the indisputably best color in the business—you've got something even better than our previous best. Which is quite a feat.

So stop by your nearest Tektronix dealer or call us at

800/835-6100, Dept. 28I for a free output sample. For faxed information call 503/682-7450, ask for document # 1223.

You won't find another business investment that looks this good on paper.





STRIPPED DO NOT STRIPPED

DIMENSION 486SX/25

\$1,499

Lease*: \$55/MO.

i486" SX 25 MHz System

4 MB RAM

170 MB (17 ms) Hard Drive

5 Drive Bays • 6 Expansion Slots

Dual Floppy Drives (3.5" and 5.25")

Accelerated Video (512 KB Video RAM)
Super VGA 1024I Monitor

(14", 1024 x 768, .28mm)

MS-DOS® 5.0/Microsoft® Windows® 3.1/

DIMENSION 486DX/33

\$**1,999**

Lease: \$74/MO.

Mouse

i486 DX 33 MHz System 4 MB RAM • 64 KB Coche

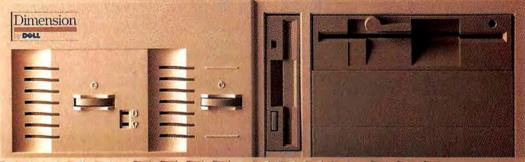
170 MB (17 ms) Hard Drive

5 Drive Bays • 6 Expansion Slots

Dual Floppy Drives (3.5" and 5.25") Accelerated Video (512 KB Video RAM) Super VGA 1024I Monitor (14", 1024 x 768, 28mm) MS-DOS 5.D/Microsoft Windows 3.1/







WN PRICES, DOWN 486s.



DIMENSION 486DX/33

\$2,199

Lease: \$81/MO.
i486 DX 33 MHz System
4 MB RAM • 64 KB Coche
212 MB (15 ms) Hard Drive
5 Drive Bays • 6 Expansion Slots
Dual Floppy Drives (3.5" and 5.25")
Accelerated Video (512 KB Video RAM)
Ultra VGA 1024NI Monitor
(14", 1024 x 768, .28mm, non-interlaced)
MS-DOS 5.0/Microsoft Windows 3.1/Mouse

DIMENSION 486DX2/50

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Dual Floppy Drives (3.5" and 5.25")
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(14", 1024 x 768, .28mm, non-interlaced)
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DIMENSION 486DX2/50s

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i486 DX2 50 MHz System
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212 MB (15 ms) Hard Drive
6 Drive Bays • 6 Expansion Slots
Dual Floppy Drives (3.5" and 5.25")
Accelerated Video (512 KB Video RAM)
Ultra VGA 1024NI Monitor
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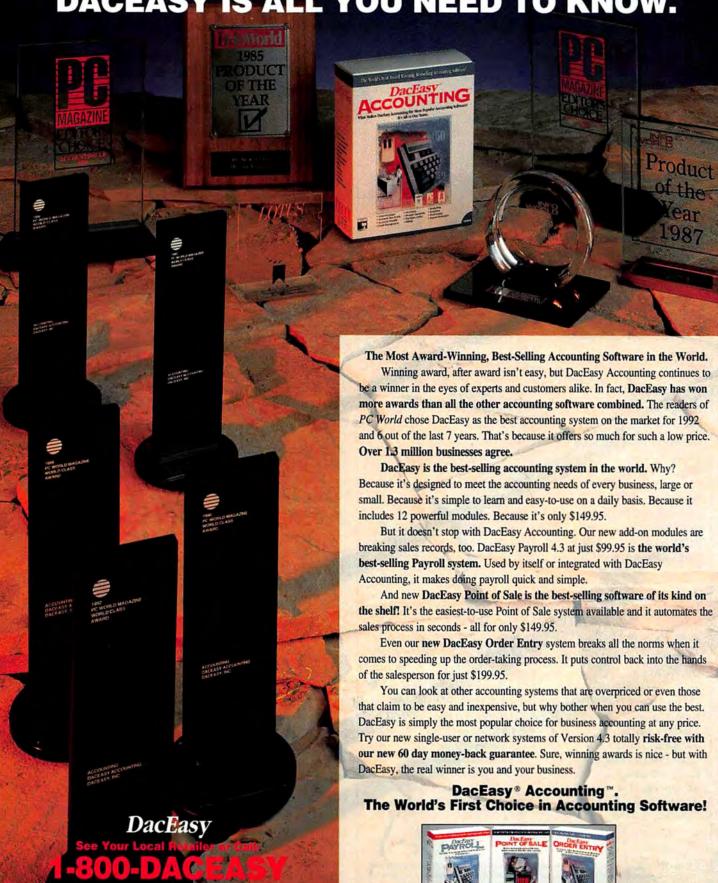
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Evolving an Upgrade Strategy

t's a problem that every company has to face sooner or later: What do you do with your old PCs when you step up to the next hardware platform? This month Heather Krause, CAD coordinator for Smith & Loveless, discusses how she helped establish a policy for distributing computing resources at her firm, a Lenexa, Kansas-based manufacturer of water and wastewater treatment and transfer equipment. -Ed.

When it comes to buying new hardware at Smith & Loveless, we're pretty conservative. With only 35 PCs for 140 employees, we need to wring as much productivity from our existing machines as we can. We buy new systems for two reasons: if a PC breaks down and is no longer worth fixing, or if we really need a piece of software that requires more horses than we have in our stable.

Since engineers are at the top of the PC food chain here, upgrade requests usually originate in my department, which is how I got involved in this process. (While my main responsibility is training our engineers to use CAD programs, I've become kind of a oneperson support staff for our PC users.)

We have everything from ancient IBM PCs to state-of-the-art 486s, but until recently the upgrade process was fairly haphazard. Hardware requests were handled by individual department managers, who passed them on to the finance people at the top. The end result: Some users got more computer than they really needed, while others got no computer at all.

Identifying the Need

The need for an organized pass-along procedure became clear in August 1990, when I was helping the head of personnel upgrade his system. He had an original IBM PC with an external 10MB hard disk. The slow CPU and minuscule storage space were cramping his ability to handle big spreadsheets. Clearly it was time for him to get new equipment. At that time the ground-level business systems were 286s, but I felt we shouldn't buy anything less than a 386.

It didn't make a whole lot of sense to upgrade him to a 386 to run 1-2-3 and WordPerfect when we had engineers running AutoCAD on 286s. That's when I came up with the idea of a centralized system for upgrades throughout the company. Whenever we bought new sys-

tems, we could pass existing equipment down to people who needed a PC but could get by with less horsepower-our own trickle-down upgrade policy.

I wrote a memo to the manager of technical services, who passed it on to the president. He decided to implement the idea and put our engineering department in charge of arbitrating requests. Since I helped coordinate PC purchases for engineering and was familiar with hardware requirements, the requests came to me.

Once word got out, I had people clamoring for new machines-and, suddenly, a bunch of new things to worry about in my "spare time." Now that we've created a clearinghouse for hardware requests, we're getting a lot more use out of systems other companies might have thrown away, and we've expanded the use of computers throughout the company to people who might not otherwise have gotten one.

Implementing the Solution

Here's how the process works. When someone decides they need a new PC, they make a request detailing what



they need to do their job more effectively. Once we decide the upgrade is justified and determine what kind of system to buy, we figure out what to do with their current machine. Fortunately, there's

no shortage of users hungry for a more

Heather Krause

helps spread the PC

wealth around at

Smith & Loveless

powerful computer-or any computer at all.

With our tight equipment budget, we need to justify the upgrade on both ends of the equation before we spend the money. If our engineers want PCs that give them quicker redraws of CAD files, they'll have to bide their time until someone else needs their current systems. We feel strongly that you can get more productivity by customizing software and teaching people to use it more efficiently than by simply throwing more power at them.

When we get hardware requests, we consider two things: which user has the greatest need, and how the upgrade will improve the productivity of the company as a whole. We base our decisions on job functions, not job titles. For exam-

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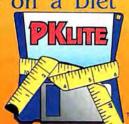


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PCW-2/93

ple, we may have a vice president who shares a PC but wants one of his own so he can spend more time crunching spreadsheets. At the same time we may have a secretary who works for several executives but still types letters on a typewriter. In that case, we'd probably give the machine to the secretary, since that's where we'd see the greatest productivity gain.

If all a user does is run 1-2-3 or WordPerfect, he or she will do just fine with one of our PCs, XTs, or 286s. We have a handful of 386s, which we've deployed in our sales and personnel departments, as well as one that we use as a file server in engineering. The 486s are reserved for those who need the most horsepower-drafters and engineers who live inside AutoCAD and other number-crunching programs, and the desktop publishers in our advertising department who run PageMaker.

The process worked so well with hardware that we decided to centralize our software purchase decisions as well. In the past, whoever used a particular piece of software in the company might evaluate a new version of the package and request an individual upgrade-not the most efficient method. Now we've set up a review committee made up of engineering and marketing personnel that evaluates software upgrades on a companywide basis.

This is essential now that we've begun work on our next big project: implementing an office automation system using a Novell NetWare LAN, with a centralized database and document management software. We hope to eventually triple the number of employees using PCs and hook them all together on the network within five years. At that point, we might even consider retiring some of our aging IBM PCs.

If you use PCs to manage people and other resources in a business environment, we want to hear from you. Send your article ideaincluding a brief outline of your company, job, problem, and solution as well as your name, address, and phone number-to Real Problems, Real Solutions, PC World, 501 Second St. #600, San Francisco, CA 94107; or send it electronically to PC World Online, Real Problems, Real Solutions; or 415/442-1891 (fax); or call us at 415/978-3224. We pay \$300 per published column. Sorry, we cannot acknowledge submitted materials.

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From Your Friends In The Business...

hank you for making 1992 the best year yet for everyone at Gateway 2000. Because of your belief in us, we captured an unprecedented five *Computer Shopper* 1992 Best Buy Awards including Best Overall Vendor.

And in *PC Computing's* 1992 MVP Awards, Gateway was honored with the MVP Desktop System Award for our 4DX2-66V system. Thank you *PC Computing*!

We're much obliged to *PC Magazine's* readers who gave us the best overall score in *PC Mag's* 1992 Service and Reliability Survey.

Our humble thanks to the readers of *PC World*. They honored us with two World Class Awards in 1992 – one for the Gateway 4DX-33 and another for Service and Support.

Our hats are off to *Compute* magazine for presenting us with 1992 Best Desktop Computer for the Gateway 4DX2-50.

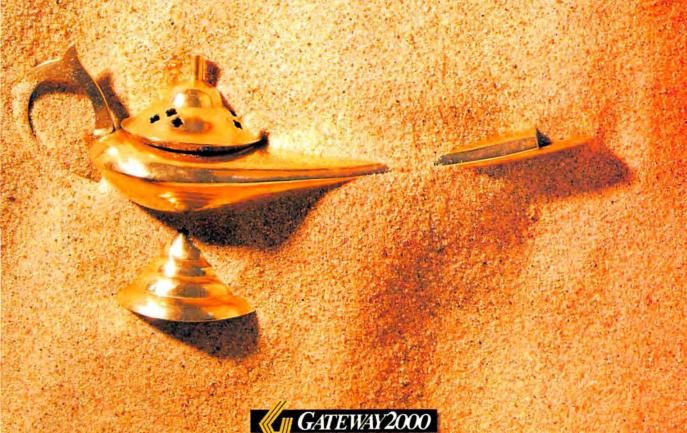
We're thrilled that *Popular Science* magazine recognized the Gateway HandBook portable PC as one of 1992's "Best of What's New."

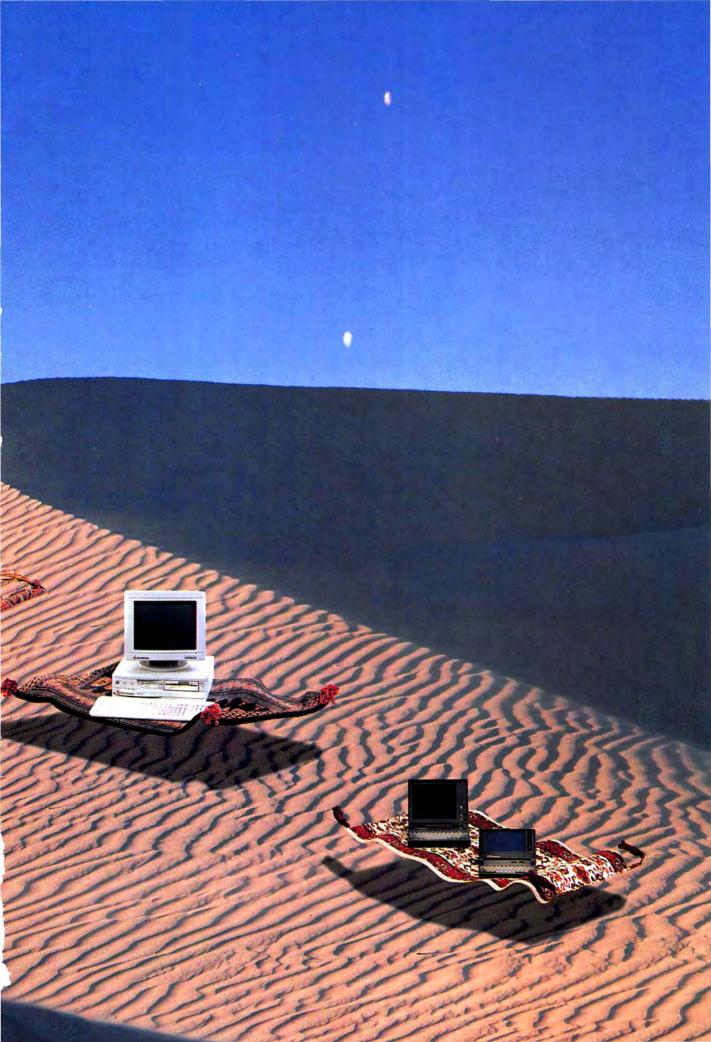
And thank you *BYTE* magazine for an Award of Distinction for the HandBook. *BYTE* readers also chose the Gateway 486DX as Desktop Computer of the Year.

Finally, we applaud all our loyal customers. Without your unwavering support throughout the years, Gateway couldn't have won these honors. We owe our success to you, and we'll be forever grateful. Here's to another great year in 1993!



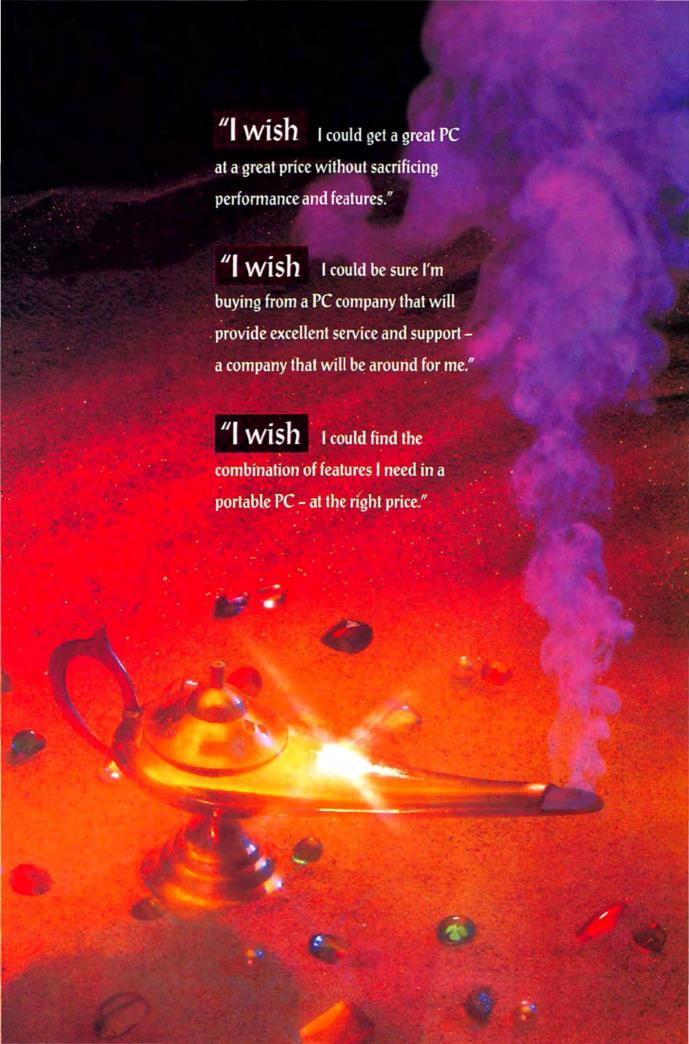
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That's because we built our business by listening to our customers' wishes and doing everything in our power to make their dreams come true. At Gateway, we believe you should be able to have it all: the latest technology, glittering performance, quality construction, enchanting service and the fairest prices in the land. All this from a financially healthy company that won't run dry and leave you stranded in the desert.

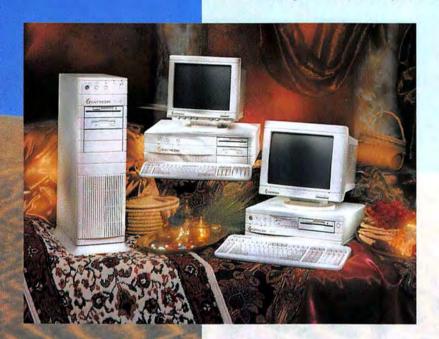
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"Gateway has gone far beyond conventional ideas of

price and performance. In doing so, it has created new rules that other PC makers will have to follow if they want to remain players."

- PC Computing, 1992 MVP Awards

"Gateway 2000 was the big 1992 Best Buy winner, sweeping not only the desktop awards as it did last year, but the newly expanded notebook categories as well ... Altogether, Gateway won five Best Buy awards this year, including Best Overall System Vendor ... It's no surprise that Gateway is consistently the people's choice when it comes to systems. Its formula for success is to sell fully configured PCs at aggressive, how-can-they-do-that prices, along with comprehensive service and technical support."

- Computer Shopper, 1992 Readers' Best Buy Awards

ous Value In The Land.

"Gateway not only captured the title for best desktop, it also got the nod for best service and support and ranked in the top five for portables, notebooks, most promising newcomer and best mail-order firm."

- PC World, 1992 Readers' Choice Awards

"I wish I could be sure I'm buying from a PC company that will provide excellent service and support – a company that will be around for me." Your wish is our command!

Twice in 1992, Gateway was honored for outstanding service. *PC World* readers ranked Gateway number one in service and support. And *PC Magazine* readers gave Gateway the best overall scores in the 1992 Service and Reliability Survey.

Just as important is our strength as a company. Warranties and assurances of lifetime technical support don't mean anything unless a company survives to honor them, which is a serious consideration in the shifting sands of today's PC marketplace.

Gateway is among the few financially robust companies in the industry. Our 1992 revenues exceeded \$1 billion and our earnings are among the strongest in the industry.

The company is virtually debt-free. At a time when other companies have been forced to lay off employees, we added 300 people to our staff.

You now have 1,800 friends in the business.

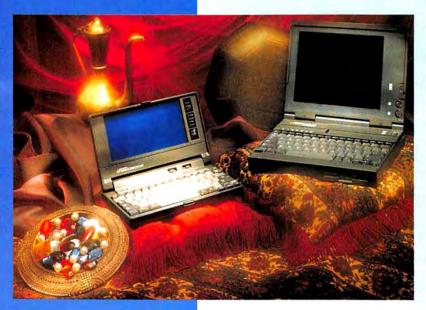
Rest assured Gateway is your oasis that will never leave you high and dry. We'll be here for you!



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"I wish I could find the combination of features I need in a portable PC - at the right price." Your wish is our command!

No matter what you need in a portable, you'll find it in one of our Nomad models or



in the Gateway HandBook.™ Gateway customers selected Nomads as the winners in 386 and 486 notebook categories of Computer Shopper's 1992 Best Buy Awards.

"There are faster laptops, there are cheaper laptops, there are color laptops, but there is no better laptop ... Weighing in at only 5.6 pounds, the Nomad combines the powerful punch of a 25MHz i486DX with a working battery life of more than six hours. At long last, we have a laptop

that can really go the distance when there's no power outlet in sight."

- Computer Shopper, 1992 Readers' Best Buy Awards

The Gateway 2000 HandBook is an enchanting, one-of-a-kind, real PC in miniature form! The HandBook, recognized by *Popular Science* magazine as one of the "Best of What's New" products of 1992, also received *BYTE* magazine's Award of Distinction.

**PC Computing* describes the HandBook as "an engineering marvel." **PC Week* agrees. "Gateway's HandBook is just about as small as a fully functional portable can be.

Because the HandBook is powerful enough for most of my needs and fits comfortably in my briefcase, I now leave the computer bag at home."



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- 14" Color CrystalScan 1024NI
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Your Basic Humble Parallel Port: A New PC Superhighway



With the constant chat about GUIs and this processor and that bus, you probably don't pay much attention to your parallel port.

The same old port has been quietly hanging onto the back of your computer for the past decade.

But of course, nothing on a PC remains unchanged indefinitely, so now it's your parallel port's turn in the spot-light. Starting in spring, this boring little aperture begins to metamorphose into a logical superhighway. Eventually a single super port will send and receive huge quantities of data to and from printers, scanners, faxes—even other LAN workstations.

Our story begins many months ago with several different groups looking for ways to boost the pitiful sub-100K/second bandwidth of Your Basic Humble Parallel Port (YBHPP). Lexmark, Intel, and others formed the Network Printer Alliance (NPA) to work on a common specification. Zenith and Xircom (the pocket LAN adapter people) helped ensure the spec would support transferring LAN data as fast as 1.5MB per second. Hewlett-Packard contributed its own bidirectional protocols, which let its new LaserJet 4 transfer data about six times faster than previous LaserJets and send full printer status and control panel information back to the PC.

Fast forward through a series of IEEE committee meetings to unify the different designs, and by summer 1992, we had the Enhanced Parallel Port (EPP). Intel included support for it in the I/O controller of its 386SL processor, which means that about half the notebooks shipping today are already capable of transferring data at least ten times faster than YBHPP.

But EPP committee members recognized that they could do a lot better if everyone could agree on a software handshaking standard. The words software standard had barely formed on their lips when Microsoft proffered its Enhanced Capabilities Port (ECP) spec—"Zippy" for short. It defines tomorrow's parallel port as a true superhighway supporting bidirectional data transfer speeds as high as 10MB per second. Zippy wasn't the only proposal on the table. But after Microsoft drafted Hewlett-Packard onto its team, the specification was adopted by all combatants before so much as pocket change could be spilled.

Actually, Microsoft had been working on speeding up TrueType printing for some time—the need for which is obvious to anyone who has ever tried printing a Windows file. In truth, Microsoft's spec was the most compelling, supporting Direct Memory Access (DMA)—controlled data transfer that's equally robust in both directions. Scanners could feed the PC data as fast as the PC can blast data to printers and other output devices.

You can glimpse Microsoft's vision of the future in its new Windows Printing System (WPS) cartridge for LaserJet IIs and IIIs. Using the limited bidirectionality inherent in today's serial and parallel ports, WPS demonstrates the kind of sophisticated graphical and audio printer feedback that should be common later this year. (Imagine your PC speaker squawking "the printer's jammed!")

The silicon for Zippy ports should be available from Chips and Technologies and National Semiconductor this spring. Conservative estimates put initial Zippy throughput in the 2MB-to-5MB-per-second range—able to support multiple peripherals operating sequentially on the same parallel port.

Of course, new capabilities always demand more resources. Some note that without a parallel-port bottleneck, Windows could partially use the Laser-Jet 4's RISC processor and 6MB of memory much the way WPS controls the Laser-Jet II. Imagine offloading a huge spreadsheet calculation to your desktop printer. Other printers could become cheap engines pumping out print files, while your PC does the rasterizing and page description.

Either method will be much faster, let you control external peripherals from your PC, and configure anything on a parallel port in a flash. YBHPP is about to become the gateway to a much wider computing horizon.

By Mike Hogan

A \$79 Connectivity Kit from BSE of Flagstaff, Arizona, lets you link the nonstandard serial port of Hewlett-Packard's 95LX palmtop to the parallel ports of ordinary printers or other addon devices like BSE's 130MB portable Flashdrive

.... Tell your computer to launch Windows apps or even read you E-mail over the telephone using the Omnivox soundboard with headset, starting to ship now for about \$200 from Kingston Technology of Fountain Valley, California Run your printer, scanner, and up to two other peripherals from a sin-



gle parallel port with the F/Mux multiplexor from Lancaster, California's Far-Point Communications. The \$199 external adapter transfers data in both directions at a fast 1.25MB/second....CompuServe subscribers can

call 800/848-8199 to order the new \$25 CompuServe Interface Manager for Windows, enabling them to browse the service off line and task-switch among its different utilities while on line; a \$50 new-member kit with signup module arrives in March.... Questions? Call 310/312-8041.

Why people who k aren't going anyw

Over 18 million people use some version of Lotus 1-2-3 every day. They depend on it. They trust it. They know it. Which is why, if they're moving from DOS to Windows, they're moving to 1-2-3 for Windows... for some very good reasons.

They know that *only* 1-2-3 is fully compatible with 1-2-3.

Only 1-2-3 for Windows is able to read and execute every 1-2-3 for DOS file, style and macro. Which means you can preserve your full investment in 1-2-3 for DOS files when you move to 1-2-3 for Windows. And only 1-2-3 for Windows—with its built-in Classic® Menu—lets you use all your familiar 1-2-3 commands.

They know that 1-2-3 offers the best 3D technology.

Only 1-2-3's 3D technology gives you easy access to 256 worksheets and lets you build 3D formulas just like you do in 2D. Which ultimately makes consolidating, comparing and analyzing data much simpler. In comparison, Excel's Workbook™ is a limited imitation of true 3D. And while working in Group Mode in Borland's® Quattro® Pro for Windows, simply cutting a range of data in one sheet unfortunately means you'll delete the data on every sheet. And what's worse, you can't undo it. All of which means if the analytical power of 3D technology is important to you, 1-2-3 is still the best choice you can make.

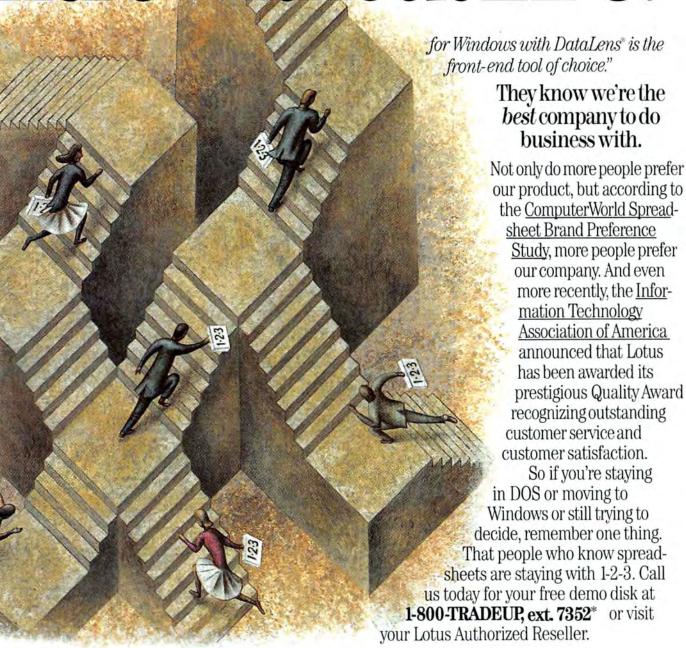
They know that 1-2-3 for Windows now includes the *most* asked-for enhancements.

The new release of 1-2-3 for Windows Release 1.1 includes a number of performance enhancements. For example, it's now the fastest Windows spreadsheet for printing on PostScript® printers. And it's also the fastest to launch. We've also added over 25 innovative new features, usability enhancements and GUI development tools. The result? 1-2-3 for Windows is now more powerful and easier to use than ever before.

They know that 1-2-3 for Windows offers unmatched database capabilities.

It's true. If you're a spreadsheet user who needs to access external databases, 1-2-3 for Windows remains unmatched—particularly if you need relational capabilities. In fact, *Corporate Computing* (August 1992) recently wrote that "for the experienced 1-2-3 database user, 1-2-3

now spreadsheets here without 1-2-3.



Lotus. 1-2-3 for Windows

Top of the News

NEW DELL PCs SPEED

These 486 systems offer incredibly easy access to system components and a path to Pentium technology.

Who says higher performance costs more? Dell Computer has revamped its 486 line with 18 speedy desktop and tower PCs. Each has a Windows-accelerating, local bus video design that delivers at least twice the graphics performance of Dell's previous 486 PCs, the company says, but costs no more. As if that weren't enough, each new Dell 486 is upgradable to Intel's Pentiumbased OverDrive processor, offering an easy path to even higher performance.

Dell's new 486 family begins with the 486/L series of five compact desktop PCs. They all feature an innovative modular design guaranteed to take the fear and loathing out of upgrading components such as RAM, disk drives, and processors. Even replacing the motherboard is a snap. Also new are five midsize 486/M models, five 486/ME's (the EISA version of the 486/M), and three 486/T models, which are floor-standing, ISA bus towers. As with all Dell systems, you pick the processor and peripherals best suited to your needs, so prices vary according to configuration. However, all combinations are competitively priced: For

Graphics on the Motherboard

Dell's new line shares a proprietary local bus video subsystem that greatly speeds up

example, a 425s/L with a 25-MHz 486SX

processor, an 80MB hard drive, and an 800-

by-600-pixel VGA monitor costs \$1499.

THE MODULAR DELL 466/L makes upgrades easy: Turn two thumbscrews to remove the cover; the hard drive and expansion card cage are held in by one screw apiece and lift out easily.

Windows applications and other
graphics-intensive programs, such as AutoCAD. Rather
than adopt a standardized local bus
approach that uses a dedicated video slot on

GRAPHICS

the I/O bus and an add-in video card, such as the VESA bus used by the Gateway 2000, Dell soldered its graphics subsystem right on the motherboard. Built around the S3 86C805 graphics chip that powers many Windows accelerator boards, this video subsystem transfers graphical data to the processor at motherboard speeds. (In our Windows 3.1 benchmark suite, the 66-MHz Dell 466/L ran about 10 percent faster overall than the average 486DX2-66 tested in recent PC World system reviews.)

Dell has also boosted overall system performance with faster chip sets. For starters, the new units boast an improved memory architecture that uses faster SIMMs (70 nanosecond versus 80 nanosecond in previous 486s). In addition, an optional 128K external RAM cache that was previously available only for Dell's EISA systems is offered with these machines.

Ready for OverDrive

Each of Dell's new 486s includes a socket for Intel's 238-pin OverDrive processor, which is based on the chip maker's next-generation Pentium processor. With four extra rows of pinholes for the OverDrive chip, this socket gives you an upgrade path that extends beyond the 486. The Pentium-based OverDrive should be available in early 1994.

These systems include several thoughtful touches that make computing a lot easier. For example, each of the ISA models has a set of diagnostic programs stored in flash RAM. Rather than sift through your drawer for a long-lost diagnostic disk if your PC won't boot, simply click the reset button twice and check the status of the entire system or of individual components like diagnostic disk drives. (Dell was 18)

disk drives. (Dell was not able to squeeze the diagnostics into flash RAM on the EISA systems.) Also new is a front-panel reset button and an LED power-on indicator, as well as support for 2.88MB floppy drives. (However, a 2.88MB drive will set you back an extra \$30.)

Modularity of the 486/L

The 486/L models are the easiest systems to upgrade we've ever seen. A compact desktop PC with room for only three ISA expansion cards, the series' modular design includes a variety of components that plug into place, making upgrades and maintenance literally a snap.

You need only turn two thumbscrews to lift off the system cover. Need to upgrade the processor or add RAM? First remove the single screw that attaches Dell's expansion card cage to the case, and lift the cage: You don't have to remove your add-in cards or their cables first because they'll stay attached to the cage. Turn another screw to release the hard drive, which lifts easily out of the case. The motherboard and floppy drives also snap out easily—no screwdriver is required.

The ingeniousness of the 486/L series begs the question: Why didn't Dell design all of its new 486 systems this way?

According to company officials, the 486/L is the testing ground for the modular design: A favorable customer response could lead to more systems built this way.

The Price Is Right

In today's cutthroat PC market, the worst thing a vendor can do is raise prices. Thus Dell's 486 prices remain com-

petitive, if not the cheapest



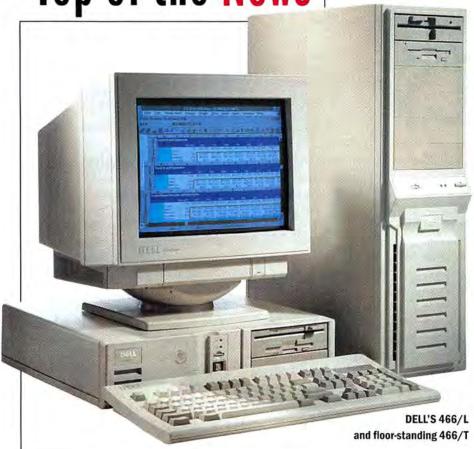
News Monitor

THE SYSTEM IS IN THE MAIL: If you ordered an IBM PS/ValuePoint in early December, you're not the only one still waiting for your system. While at the time IBM told customers the wait for ValuePoints would be four to six weeks, industry watchers were less optimistic. And the situation may not improve. Analysts say PCs ordered in early 1993 from IBM and other large vendors may not be received until the spring. Orders for low-end systems aren't slowing down, and component shortages are worsening, says JoeAnn Stahel, a senior industry analyst at InfoCorp. Stahel says vendors will be stuck as Intel is pressed for 486 chips. Meanwhile, Compaq is still battling its backlog, which it now says will end in March. As of December, Dell customers were also waiting two to three weeks for some systems.

COMPAQ DIRECT: Compaq Computer now sells its desktop and notebook PCs through five national mail-order vendors. The move expands Compaq's distribution to reach more customers in the home and small-business markets. The vendors are Granite Computer Products, Insight Distribution Network, PC Connection, PCs Compleat, and USA Flex. Compaq PCs sold directly include ProLinea and Deskpro 386 desktops and Contura, LTE Lite/25C, and LTE 386s/20 notes.

NOVELL'S PERSONAL NETWARE: MId-

1993 should bring Novell's response to Microsoft's Windows for Workgroups. Novell plans to integrate its NetWare Lite peer-to-peer networking software (continued on page 65) Top of the News



Continued from page 63

around. The 433/L model with a 33-MHz 486DX processor, 8MB of RAM, 1MB of video DRAM, one floppy drive, a 230MB hard drive, and a 14-inch, noninterlaced 1024-by-768 super-VGA monitor costs \$2499. A similarly configured 433/M, Dell's midsize 486 desktop with six ISA slots, costs \$2749.

For power users, Dell's 466/ME, a midsize EISA desktop with six expansion slots, costs \$3449. This system has a 66-MHz 486DX2 processor, 8MB of RAM, 1MB of video DRAM, one floppy drive, a 230MB hard drive, and a 14-inch, noninterlaced 1024-by-768 monitor. A similarly configured 466/T, Dell's floor-standing tower model with eight ISA slots, costs \$3399.

Meanwhile, at the bargain end of the PC spectrum, Dell, Compaq, IBM, and other manufacturers continue to do the pricing limbo. Dell recently reduced prices on its low-end Dimension series, a collection of ten 386 and 486 systems that cost less than the models in Dell's new lineup

Apple Offers 600-dpi Cross-Platform Printing

Finding a laser printer that works with both Macs and PCs just got cheaper and easier. Apple has announced two PC-compatible PostScript printers for under \$3000: the LaserWriter Pro 630 and Pro 600. Both boast two ports for PCs and improved resolution, gray-scale, and paper-handling features. For small to medium-size work groups with mixed platforms and demanding graphics needs, these products warrant serious consideration.

Both the \$2999 LaserWriter Pro 630 and the \$2399 LaserWriter Pro 600 meet the new office printer performance standards set by Hewlett-Packard's LaserJet 4 printers: print speed up to 8 pages per minute at resolutions up to 600 dpi. The LaserWriters include PostScript Level 2, the 64-font Apple Font Library with 35 printer-resident PostScript Type 1 fonts, support for True-Type fonts, and built-in parallel, serial, and

LocalTalk ports for easy connectivity in mixed environments. Both Apple printers include a 100-page and a 250-page paper tray, with an optional 500-page tray for \$399 and a 75-envelope feeder for \$399. The 630 adds two SCSI ports (one internal, one external) for attaching hard drives to store

Apple LaserWriter Pro 630, 600

Key Features

- Attach PCs and Macs
- TrueType fonts and PostScript Level 2
- Automatic paper tray switching

Availability

January

Pricing

LaserWriter Pro 630 \$2999, 600 \$2399

Apple Computer Corp. 800/776-2333, 408/996-1010 Reader service no. 736 additional fonts, an EtherTalk port for highperformance Mac networking, and 8MB of RAM—4MB more than the 600—for demanding graphics applications.

We tested a preproduction version of the 630, which is geared toward graphics professionals. It offers two advanced printing modes: PhotoGrade for improved gray-scale output and 600-dpi resolution for smoother, better-looking type. (A \$269 4MB memory upgrade lets the LaserWriter 600 print in these two modes; without it, the 600 prints at 300 dpi only.)

The current version of PhotoGrade offers 91 levels of gray, up from 67 levels available in the version included in Apple's older LaserWriter IIg and IIf. The only hitch is PhotoGrade's 300-dpi resolution limit—using the feature when you print documents that include text and photos means sacrificing a little quality in the text and line drawings, which look better at 600 dpi.

but lack many of the advanced features of these systems, such as local bus video and the capability to be upgraded to OverDrive for DX2.

Of course, Dell's new lineup comes with the company's respected service and support, including toll-free technical support and on-site service. Once again, Dell offers systems with a mix of innovative technology and competitive pricing that makes them serious contenders.

-Jeff Bertolucci

486/M

Key Features

- Midsize ISA desktop
- Six 16-bit expansion slots
- Diagnostics in flash RAM

486/ME Key Features

- Midsize EISA desktop
- Four 32-bit expansion slots
- Two 16-bit slots

486/T

Key Features

- Floor-standing ISA tower
- Eight 16-bit expansion slots
- . Six external, half-height drive bays

Dell 486s

Four new 486 series with local bus video.

Availability

Immediate

Pricing

\$1499 to \$4989

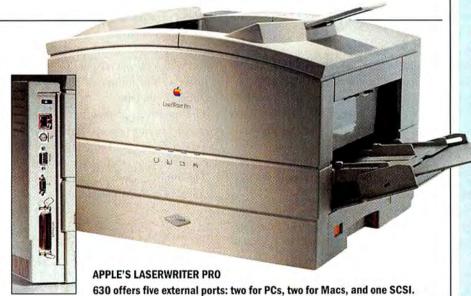
Dell Computer Corp. 800/289-3355, 512/338-4400

Reader service no. 737

486/L

Key Features

- Modular design for easy upgrades
- Three 16-bit ISA expansion slots
- Diagnostics in flash RAM



We printed gray-scale scanned images from *Windows 3.1* applications at 300 dpi using PhotoGrade and at 600 by 600 dpi without PhotoGrade. Images printed about 15 percent faster using PhotoGrade than at 600 dpi, but the PhotoGrade versions didn't reproduce the originals as faithfully.

The LaserWriter Pros offer conveniences you've come to expect, including a small footprint of about 17 by 17 inches. They also feature automatic tray switching, and the toner cartridge is accessible and snaps in and out for easy replacement. All in all, Apple's new LaserWriter Pros offer solid value for offices with demanding graphics needs that want to save money by sharing a laser printer between Macs and PCs.

-Randy Ross



News Monitor

(continued from page 63)

with the DR-DOS operating system, add additional features like remote access, and call it *Personal NetWare*. *Personal NetWare* will include dial-in access and remote printing, as well as DR-DOS's memory management, password protection, disk compression, and other utilities. Novell plans to market *Personal NetWare* three ways: in conjunction with NetWare (for creating departmental work groups for file and printer sharing), bundled with PCs, and as a retail product aimed at Net-Ware users and at small businesses setting up peer-to-peer networks.

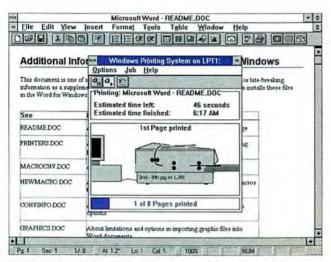
ALR'S SMARTLINE: With its new Smart-

Line PCs, ALR has made its move in the competition between big-name PC companies for small-budget customers. The entry-level SmartLine collection features a 33-MHz 386SX-based Flyer SC with 2MB of RAM and an 80MB hard drive; it starts at \$799 without monitor. "In the past, people really wanted to design high-end machinesand entry-level machines were just older versions of the high-end models," says ALR president Gene Lu. "Now, manufacturers are focusing on entrylevel machines, and they're rivaling the high end in quality and value." The 33-MHz 386-based SmartLines can be upgraded with 25-MHz 486SX processors and up to 16MB of RAM.

BORN IN THE U.S.A.: Bruce Springsteen would likely approve the efforts of a Lexmark-led consortium to build on U.S. soil more of the 2.5 million (continued on page 67)

Top of the News

Microsoft Speeds Windows Printing



MICROSOFT'S PRINTING SYSTEM helps you track your print job.

TEST DRIVE

Everyone, but particularly Windows users,

needs to print documents faster. Microsoft has come up with a solution for owners of HP LaserJets, even if they're short on time, technical expertise, and cash. The \$199 Windows Printing System boosts Windows printing speed as much as 5 times and offers one of the easiest installations we've seen for a printer enhancement product. Moreover, the product works with a wide range of HP products, including Series II, IIP, IIP+, IID, III, IIIP, and IIID printers.

The Windows
Printing System
tem consists

Microsoft

THE
WINDOWS
PRINTING SYSTEM cartridge is
easy to install.

of a plug-in cartridge and software that includes a driver and 79 fonts. The combination, which essentially installs parts of Windows 3.1 on your printer, puts your PC and printer on speaking terms. As a result, printing is faster because instructions don't have to be translated from the Windows command language to the printer command language. In addi-

tion, the non-networked printer can now send messages, such as 'paper out' or 'printing finished', back to the PC.

Effortless Installation

Installing the Windows Printing System hardware is a no-brainer: Just plug the cartridge into the font slot on the front of the printer. That's a lot easier than installing many other printer accelerator products, which typically combine an ISA expansion card with a font slot cartridge or a video interface module that plugs into the back of the printer.

Installing Windows Printing System software is also simple. You just issue the File Run command in Program Manager and follow the instructions. Other products require you to add drivers manually to the Printer dialog box in the Windows

Control Panel and then adjust the Setup menu.

Microsoft claims the Windows Printing System can increase standard printing speed up to 5 times, with the most dramatic improvements for printers that have not been upgraded with memory and are used chiefly to print long, complex

documents. Users printing PostScript documents should witness even more dramatic speed benefits—improvements of up to 10 times can be obtained, Microsoft claims. But even for printers packed with additional RAM, speed enhancements can be significant. On a LaserJet Series II crammed with 2.5MB of RAM, a one-page newsletter printed about 2.5 times as fast as it did before we installed the Windows Printing System. A complex gray-scale graphic printed twice as fast.

Easier Printing

For printers connected directly to your PC, this product provides visual and audio feedback on the progress of your print job. As an on-screen graphic depicts the document traveling through the printer, a computerized voice tells you what is happening over your PC's speaker and alerts you to problems, such as a jam or lack of paper. You can monitor the printer from your desk or anywhere within earshot of your PC—no more running to the printer to check on the progress of your job.

The on-screen graphic has a menu of common printing options, such as halftoning and collating, that saves time by providing a uniform print menu for your apps.

The Printing System, including fonts, requires about 7.5MB of hard disk space.

-Randy Ross

Microsoft Windows Printing System Key Features

- Two to five times faster printing
- . Easy to install and use
- Provides feedback on printing progress

Availability

Immediate

Pricing

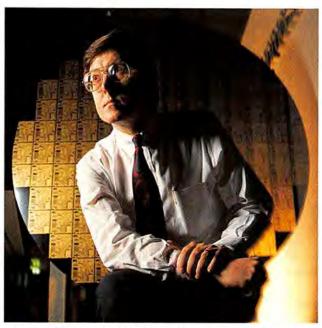
\$199

Microsoft Corp. 800-426-9400

Reader service no. 738

BERT HOLMGREN

Intel Reveals Pentium Details



INTEL'S RON CURRY: Processing in the future with Pentium.

ike most technobabies, it emerged late from the delivery room, but Intel's next-generation Pentium processor should appear in systems from every major PC vendor by March. Early glimpses confirm that it will be one very hot chip.

The 66-MHz Pentium zips along at over 100 MIPS—more than twice the horsepower of a 486DX-33. It's ready for the heaviest server duty and is the equal of many RISC competitors, boasts Intel product manager Ron Curry. Yet, with Pentium systems likely to debut in the \$4000-to-\$6000 range, they'll make sense for Windows power users as well as those who tangle with large spreadsheets and audio/video.

The chip gets its punch from integer unit, cache, bus, and floating-point enhancements—a combination that makes it operate like a pair of 486s. Its 64-bit doorway is twice as wide as that of Intel's 486 generation, and program code and data have their own dedicated 8K caches. Add an ability to predict what should be in the cache, and you have a chip that typically executes more than one instruction per clock cycle.

The Pentium is even better at number crunching. Its floating-point unit is beefed up with more transistors; dedicated multiply, add, and divide units; and other enhancements that let it complete floating-point calculations in one-tenth the time a 486DX-33 takes.

Software will need to be recompiled to take full advantage of Pentium innovations, but even 16-bit applications will run twice as fast as they do on a 486DX2-66, says Curry.

Welcome to the era when all processors wear heat sinks as top hats. Precisely how many watts various implementations of the Pentium will draw and how hot they will get is an open question. The heat-sink-bedecked 486DX2-66 draws about 3 watts, and the Pentium has almost three times as many transistors (3.1 million). But typical usage is probably well below 9 watts, says Curry, because different elements can be powered down when not in use. Pentium can also power down other PC subsystems for a considerable savings in electricity.

Similarly, PC makers' creative use of heat sinks in combination with air channeled over critical areas should eliminate heat as a problem, maintains Curry.

IBM, Compaq, Dell, NCR, NEC, and AST all showed Pentium implementations in November and expect to have Pentium-oriented enhancements ready the day Intel introduces the chip.

Don't expect Pentium shipments to overtake those of 486s this year. Do expect Pentium clones in 1993. For now, Pentium makes the score: advantage, Intel.

-Mike Hogan



News Monitor

(continued from page 65)

notebooks and subnotebooks expected to be sold here this year. Flag waving aside, the team of Lexmark, AMD, Cyrix, Western Digital, and an IBM manufacturing group figures it can beat the Japanese and Taiwanese in delivering to U.S. relabelers portables with features such as customizable CPUs, keyboard innovations, and rechargeable batteries. A floppyless, 3.5-pound "minibook" with eight hours of battery life and up to 170MB of hard drive should appear under various labels for around \$2000 this quarter. The major exception to the "Made in U.S.A." label will be the machines' backlit monochrome and color LCDs from Sharp.

WHAT HATH DELL WROUGHT? Not long ago, most PC makers followed the leaders-Compag and IBM-in telling you to take repair problems to a dealer. Now, no one fights harder than the leaders to lend you a hand. Compag has slapped a three-year warranty on all its desktops and notebooks, including a year (three years for servers) of second-business-day, on-site service. IBM HelpWare delivers three years of on-site service faster-next business day-but only for PS/2s, not notebooks, ValuePoints, or PS/1s. The new CompagCare offers a lifetime of 24hour, toll-free technical support seven days a week. Dell, which got the service-and-support ball rolling, has a oneyear, next-day on-site package for its high-end line, but a less comprehensive one for its budget PCs.

Jeff Bertolucci, Mike Hogan,
 Laurianne McLaughlin

PageMaker Much Improved

TEST DRIVE

PageMaker 5.0 for Win-

dows offers a host of new controls and tools so well implemented and integrated that users upgrading from version 4.x will probably spend more time installing the program than mastering its new offerings.

First-timers will find a top-ofthe-line page makeup program that's easier to use than any of its competitors—and easier to use than its previous versions. And its documentation is probably the most lucid and best organized of any program of comparable complexity.

The major change in the program is operational: The addition of a "control palette" (similar to the one used by its Macintosh rival *QuarkXPress*, which was recently released in a *Windows* version) eliminates a lot of forays through menus and dialog boxes. The palette functions are context-sensitive, so

PageMaker 5.0 for Windows

■ WINDOWS ▼ Highly integrated features make the latest version easy to use.

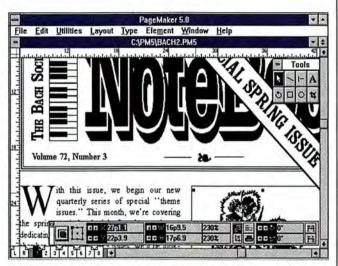
Key Features

- Context-sensitive control palettes
- Guaranteed accuracy to % point
- Panose font matching system retains format for non-PageMaker users
 Availability

February Pricing

\$895

Aldus Corp. 206/628-2320 Reader service no. 735



PAGEMAKER 5.0's new context-sensitive control palette puts dozens of tools at your fingertips, eliminating time-wasting menu safaris.

when you're working with text, for instance, you can adjust text frame size and set paragraph specs. If you're working with graphics, the palette allows you to adjust the position, height and width, rotation, cropping, skew, and scale of an image.

PageMaker 5.0 does these things with great precision, guaranteeing accuracy to 1/20 of a point. That translates into single-dot precision at a resolution of 1440 dots per inch (PC World is typeset at 1270 dpi).

Most of 5.0's other new features are of the "it's about time" variety. They include baselineto-baseline leading, custom rule weights (for dashed and dotted lines, too), automatic color separations (simply an option in the Print dialog box), rotations and skews in any increment for both text and graphics, step-andrepeat copying, image control for halftones, and the ability to nudge items in minute increments to align or position them precisely.

A number of add-on modules

expand PageMaker's capabilities, including tools for editing kern tables, creating PostScript Multiple Masters font variations, and writing batch file "scripts" to execute a series of operations within PageMaker:

A unique PageMaker 5.0 offering is an implementation of the Panose font matching system. This system indexes the design characteristics of

most major typefaces, enabling appropriate substitutions for unavailable fonts. A *PageMaker* document, then, could be circulated electronically and retain its format regardless of whether the receiver has the fonts used in the original document.

By filling gaps in its tool kit and emphasizing productivity and precision operation, *PageMaker 5.0* consolidates its previous strengths and covers its old weaknesses in an efficient, easy-to-use bundle.

-James Felici

PCMCIA, ExCA: Acronym Overload?

Just when you figured out what PCMCIA stands for (hint: Personal Computer Memory Card International Association), along comes ExCA, a specification created by Intel to ensure that PCMCIA cards will work in any PCMCIA slot in an Intel-based PC.

Thus far, most PCMCIA card manufacturers have chosen to support ExCA, or Exchangeable Card Architecture.

However, some portable PCs with PCMCIA slots will use non-intel CPUs and aren't covered by the ExCA spec. Consequently, some PCMCIA card vendors believe a one-card-fits-all standard is the best approach.

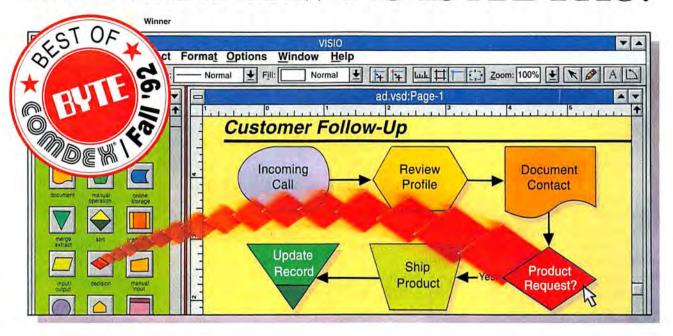
Will end users get lost in the acronym jungle? "I think that's a relevant concern, and we've been doing as much as we can to make sure that isn't the case," says Jim Weisenstein, Intel's FlashCard Systems Group director and pres-

> ident of the organization PCMCIA.



PCMCIA PRESIDENT JIM WEISENSTEIN

VISIO IS FOR ANYONE WHO THINKS DRAWING IS A DRAG.



Now you don't have to be a graphic artist or draftsman to create impactful business and technical drawings.

Because if you can drag and drop, you can draw. It's easy with Visio, Shapeware's



By just clicking your mouse, Visio lets you drag and drop shapes, change their size or color, connect them automatically and type in text. Drag. Drop. Done! It's that easy.

Only Visio gives you more than 300 drag and drop

SmartShapes[™] to help you create virtually any drawing or diagram.

Unlike clip art, SmartShapes are "intelligent." They can take on different forms, colors, and proportions and behave the way you expect. And with

Visio's simplified tool set, you can easily create your own customized shapes using a single pencil tool.

For easy access, SmartShapes appear right on your screen on job-related "stencils." Each stencil features all the shapes you could possibly need for your specific drawing.

There's a Visio stencil for flowcharts. One for space plans. Organizational charts. Business models. Marketing diagrams.

Gantt charts. Computer network layouts. Engineering schematics. And direction maps. Visio includes 15 stencils, standard. And you can also get additional stencils for more specific jobs.

So if you need to concentrate on *what* you want to draw, not *how* to draw it, you need new Visio from Shapeware. The only Windows software that lets you draw from more than your imagination.

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Fleet of VL-Bus Boards Boost Graphics Speed

he introduction of a wide assortment of local bus boards offers users a rich selection of solutions for dramatically improving graphics performance.

"Local bus" refers to bus designs that run at the system's clock speed instead of the 8.33-MHz speed of standard ISA buses. Peripherals such as graphics adapters, disk controllers, and network cards can send and receive data much faster on a local bus than on a traditional bus, and that should boost system performance.

To take advantage of the local bus, both the system and the peripheral have to be designed to the same specification putting a standard ISA card in a local bus slot won't improve performance at all. Since many board makers use the same graphics accelerator chips, the quality of their drivers will be a key differentiator.

To make local bus cards and systems compatible, manufacturers have to agree on how the local bus will work—how signals along the bus are timed, which kinds of data are carried on which wires, and so on. There are currently several competing designs.

First, some system vendors have proprietary local buses. Most are motherboard, videoonly solutions that don't offer a slot. Second, Intel is promoting its local bus standard, called PCI (Peripheral Component Interconnect). But that standard isn't fully defined, so there are currently no PCI products.

The one standard local bus design with products is the

Video Electronics Standards Association's, the VESA local bus ("VL-bus" for short). The VL-bus handles 32 bits of data at a time, so it's faster and wider than the standard ISA bus. As system vendors rolled out VL-bus PCs, board makers followed

with VL add-ins, usually video controllers.

Virtually every major video board maker has announced a VL-bus product. ATI Tech-

nologies was one of the first, followed by Actix Systems, Artist Graphics, Cardinal Technologies, Diamond Computer Systems, Genoa Systems, Hercules Computer Technology, Matrox Electronics Systems, NDI, Number Nine Computer, Orchid Technology, STB, Video Seven,

All these products are based on graphics accelerator chips optimized for graphical user interfaces like *Windows* (they handle the graphics functions most commonly used by GUIs, relieving the CPU of the job). But drivers are the key to optimum performance.

and VidTech Microsystems.

When PC World first looked at a VL-bus system, specifically a Gateway DX2-66 using ATI's Graphics Ultra Pro board, we were unimpressed. But when we retested the system with revised drivers, performance improved dramatically; the system became one of the fastest we've ever tested.

None of these boards will do you any good without a VL-bus PC. Vendors include Austin Computer Systems, DFI, Gateway 2000, Hyundai Electronics, Northgate Computer Systems, and Zeos.

Should you invest in the VLbus now? There is no consensus, and some observers believe PCI is a better bet for the long run. But if you want the fastest graphics you can find today, the VL-bus looks like it'll give you a good ride.

-Dan Miller

Board Mania: VL-Bus Add-Ins Proliferate

Company	Product	List price ¹	Processor	Memory ²	Refresh rate (Hz) ³
Actix Systems	Graphics Engine 32VL	\$249	S3 805	1/2MB DRAM	72
	Graphics Engine 32VL Plus	\$269	S3 805	1/2MB DRAM	72
Artist Graphics	WinSprint 900 VL	\$795	S3 928	1/2MB VRAM	72
ATI Technologies	Graphics Ultra Pro VLB	n/a ⁴	ATI Mach 32	1/2MB VRAM	76
Cardinal Technologies	WarpSpeed	\$599	Weitek P9000	1/2MB VRAM	76
Diamond Computer	Stealth 24 VLB	\$249	S3 805	1MB DRAM	72
Systems	Stealth Pro VLB	\$349	S3 928	1/2MB VRAM	72
	Viper VLB	\$549	Weitek P9000	1/2MB VRAM	72
Genoa Systems	Windows VGA 24 VL	\$199	Cirrus Logic	1MB DRAM	70
			CL GD5422		70
	Windows VGA 24+ VL	\$269	S3 805	1MB DRAM	
Hercules Computer Technology	Graphite VL	\$449	IIT AGX015	1/2MB VRAM	80
Matrox Electronics Systems	MGA Impression	\$799	MGA	1/2/3MB VRAM	76
NDI	Volante Warp 10-LB	\$399	S3 805	1/2MB DRAM	70
	Volante Warp24-LB	\$499	S3 928	1/2MB VRAM	72
Number Nine Computer	#9GXE	\$495	S3 928	1/2/3MB VRAM	100
Orchid Technology	Fahrenheit VA/VLB	\$299	S3 805	1/2MB DRAM	70
STB	PowerGraph VL-24	\$299	S3 805	1MB DRAM	75
Video Seven	Win.Pro LB	\$299	S3 805	1/2MB DRAM	72
VidTech Microsystems	FastMax LB	\$299	Avance Logic GUI Ultra	1/2MB DRAM	72
	GraphMax LB	\$499	IIT AGX015	1/2MB VRAM	72

¹1MB version. ²Most cards support 256 colors at 1024 by 768 resolution. With 2MB, these same boards should be able to display 65,536 colors at the same resolution. ³Maximum refresh rate at 1024 by 768 resolution, noninterlaced. ⁴Not available at press time.

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Answers and help are yours for the downloading on the U.S. Small Business Administration's new bulletin board, SBA On-Line. "This service gives fast, free help," sald Patricia Saiki, administrator of the SBA. "It's opening up opportunities for people. Ours is the first truly user-friendly bulletin board from a government agency. And it's a service that never sleeps."

Users can read or download information on SBA programs and resources 24 hours a day. Topics include financial assistance and loans, government contracting opportunities, special programs for women and minorities, and the 30 most-asked small-business questions. Continually updated regional calendars show opportunities in training programs and trade shows. Also, the bulletin board tells you how to call the SBA's group of volunteer retired executives, who give help in their fields.

SBA On-Line really is easy to use. A quick search feature lets you zip through the menu to categories of interest. Its electronic mailboxes let you leave messages and obtain help from a big group: The bulletin board is getting 1000 calls a day, according to Saiki. The SBA On-Line phone numbers are 800/859-4636 for 2400-bps modems,



PATRICIA SAIKI, administrator of the U.S. Small Business Administration

and 800/697-4636 for 9600-bps modems (202/205-7265 or 202/401-9600, respectively, in Washington D.C.). For more information, call 800/827-5722.

Cheap Talk: Low-Cost Speech Recognition

peech recognition is making its way to desktop PCs. A flurry of new, inexpensive products such as Microsoft's \$289 Windows Sound System and IBM's \$149 Dragon Talk To Plus allow users to control Windows applications using simple voice commands.

Vendors say speech recognition won't replace the keyboard or mouse any time soon, but it's much faster for certain tasks. A speech recognition—capable soundboard, software, and microphone let you use singleword commands to launch Windows applications and easily perform commands like highlight, delete, cut, and paste.

Microsoft is among the first to offer a speech recognition product for Windows. Its Windows Sound System, a hardware-software combo that includes a PC add-in audio card, a microphone, and headphones, offers software "vocabularies" for 15 popular Windows applications.

In addition to Microsoft and IBM, many smaller vendors are introducing soundboards with speech recognition. A number of companies, including Best Data Products, Cardinal Technologies, Computer Peripherals, Digitan Systems, JetPad Systems, Kingston Technology, and Zoltrix have or plan to have products based on Sierra Semiconductor's Aria Listener chip set. Street prices range from under \$200 to \$400.

"The prices are pretty attractive now, and we're looking for

wide appeal when they drop under the hundred dollar level," says analyst Bill Ablondi of BIS Strategic Decisions in Norwell, Massachusetts. Considering the intense competition, the \$100 mark could be attained fairly soon, according to Ablondi.

"We are seeing

speech recognition enter the mainstream business community for the first time," says Dr. Janet Baker, president of Dragon Systems in Newton, Massachusetts, a leading speech recognition software developer whose technology is included in both IBM's and Microsoft's speech software.

But speech recognition can be a hard sell. Used to seeing characters "talk" to computers in science fiction movies and on TV shows such as *Star Trek*, people often "have unrealistic expectations" of what speech recognition can do, says Bob McBreen, product manager for Microsoft's Windows Sound System in Redmond, Washington. He says the solution is to avoid overselling the product. McBreen doesn't recommend Sound System for stock exchanges or other environments where background chatter can make speech recognition difficult. "It's designed for the standard office," he says.

-Jeff Bertolucci

Speech Recognition Boards Reach the Market

Company	Product	Price	Features
Computer Peripherals	ViVa Maestro 16VR	\$399	DSP-based stereo soundboard, SCSI port, software
Cardinal Technologies	Soundpilot	\$399	16-bit stereo soundboard, software
Microsoft	Windows Sound System	\$289	16-bit PC audio card, microphone headphones, software
IBM	Dragon Talk To Plus	\$149	Software for controlling Windows using voice commands



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A Few Pointers for Portables

ocation, location, location. The maxim that dictates value in the real-estate market also applies to notebooks. With space at a premium, choosing a notebook with its pointing device in the right location and configuration for you can make the difference between

and size are optimal, and buyers concur. In just one year Apple has sold over 400,000 units, placing it among the top three notebook vendors by volume.

The Mouse That Roared

While Apple's integrated trackball is not the only reason for the PowerBook's success, its convenience is a distinguishing characteristic. Following Apple's lead, nearly every notebook vendor now offers either an integrated pointing device or a nifty snap-on alternative.

Location remains the sticking point; there just isn't a lot of room on your typical notebook. Vendors' efforts to compete with the PowerBook without sacrificing size or weight have led to a wide variety of

solutions. Most notebook vendors have settled the pointing device somewhere on top of the keyboard, a few nestle it by the cursor keys, and Compaq and BCC have installed theirs on the screen panel.

"We felt we had to integrate

number of vendors expressed dissatisfaction with the current placement of their trackballs. they claim that integration, regardless of its convenience, drives the buying decision. Jon Thomas, vice president of sales at Altima Systems said of Altima's trackball (which is located above the keyboard), "Customers like having it, and they adapt to the location."

Mice Run Amuck

And then there are the daring innovators. IBM's ThinkPad features the TrackPoint II, an craserlike joystick nestled in the middle of the keyboard, which you steer with a fingertip (the buttons are below the <Space> bar). AST Research and Zenith Data Systems went the clip-on route with trackball expansion panels that attach to the front of their new notebooks. Everex's Impact line of modular portables features a trackball that nests within the computer for storage and flips out to occupy a port on the right or left side. Another approach has been adopted by, among others, Texas Instruments and Toshiba America. Both companies use the QuickPort BallPoint mouse from Microsoft, a cableless trackball that connects directly to the side of the notebook.

The market for separate pointing devices remains brisk, with steady sellers such as the Microsoft BallPoint Mouse (the regular version of the QuickPort) and the Logitech TrackMan Portable, trackball devices that attach to your notebook with

NEW-AGE POINTING DEVICES. clockwise from top right: Everex Impact movable unit; PowerBook trackball, below; Logitech Track-Man Portable; AST SmartPoint and ZDS LitePoint.

clips. A new addition to the menagerie is the PortaPoint device from Interlink Electronics, a pressure-sensitive button that you push with your finger to dictate direction and speed.

Even if a trackball is not conveniently located, users seem to prefer integration. Jim Metzler, CPA partner at Gaines, Emhof, Metzler & Kriner in Buffalo, says, "I already carry around a ten-key pad as well as the power supply. I don't want anything else."

Scot Schulte of Logitech, which manufactures the trackball device for the PowerBook as well as other machines, predicts that vendors will heed user demands quickly. "Within 18 months virtually every portable computer sold will include an integrated device of some sort."

-Melissa R. Riofrio



owning a highly productive tool

or lugging around a source of

Driven largely by the migra-

tion of Windows to mobile com-

puters, vendors have experi-

mented with countless itera-

tions of pointing devices

designed to achieve the right

combination of ergonomic de-

constant irritation.

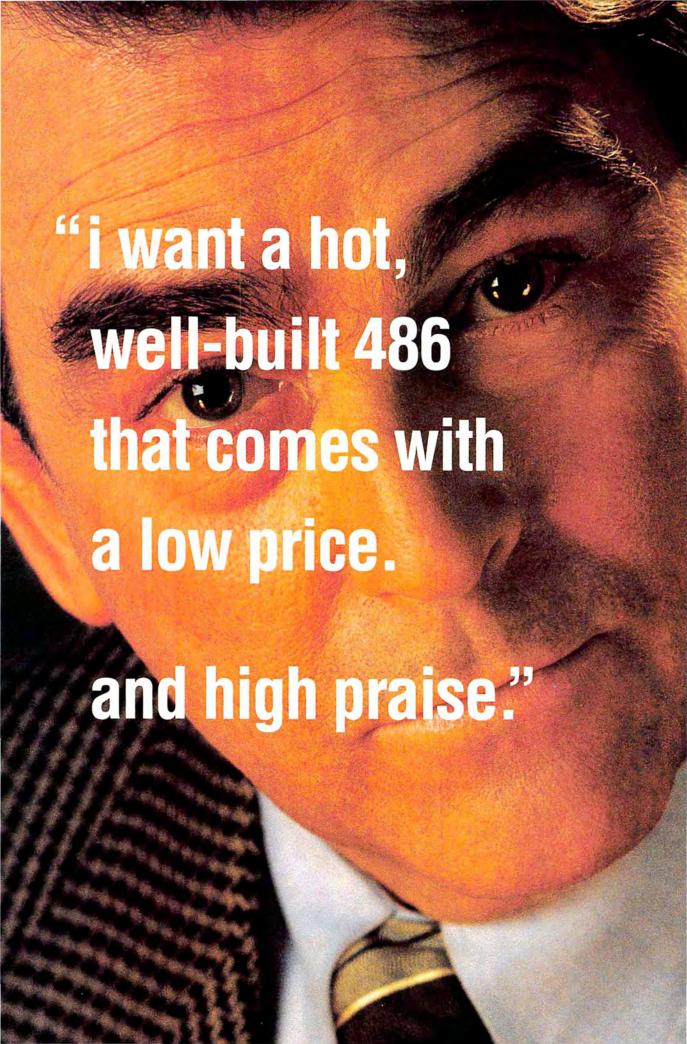


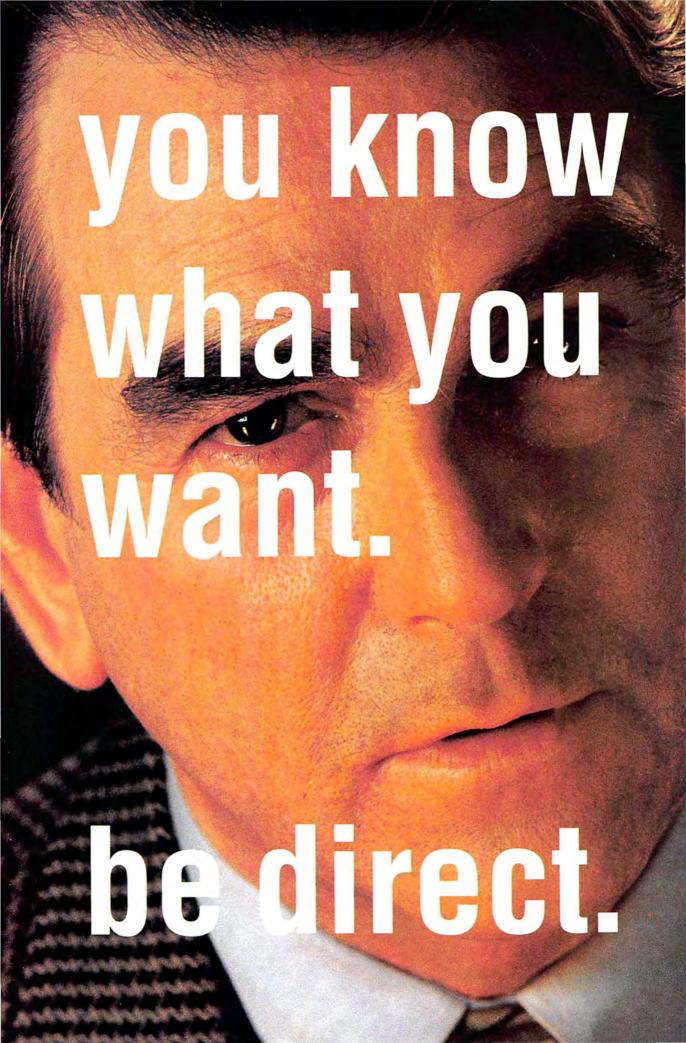
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the keyboard. Many vendors

agree the trackball's location





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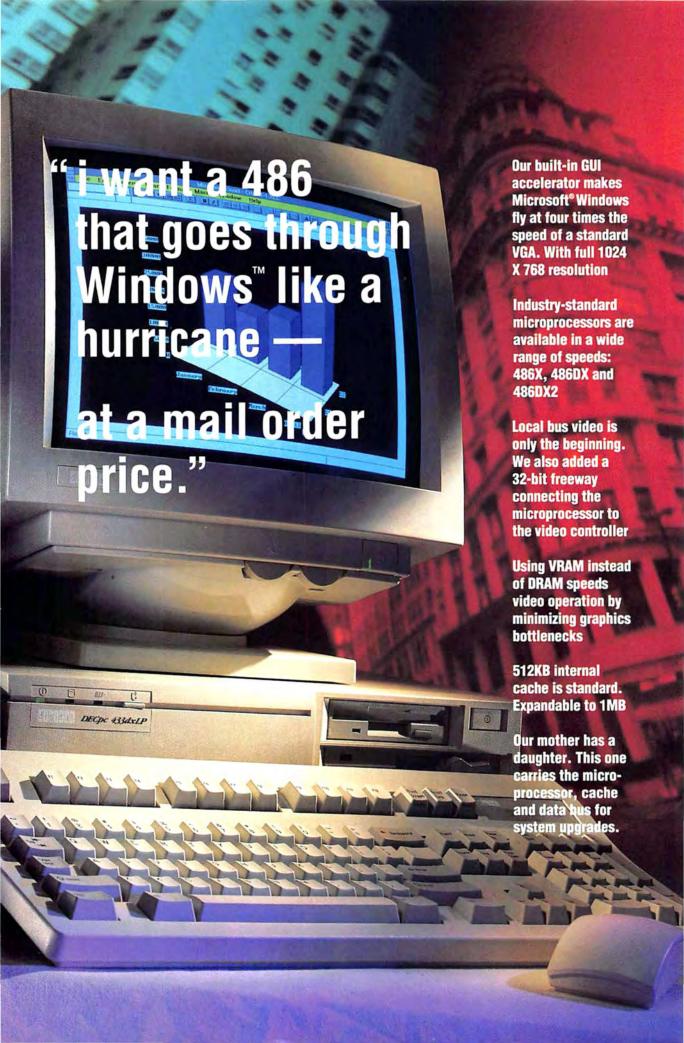
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Dell System 486D/50 (486DX2/50)	450	5,525	241	4,272	1.58





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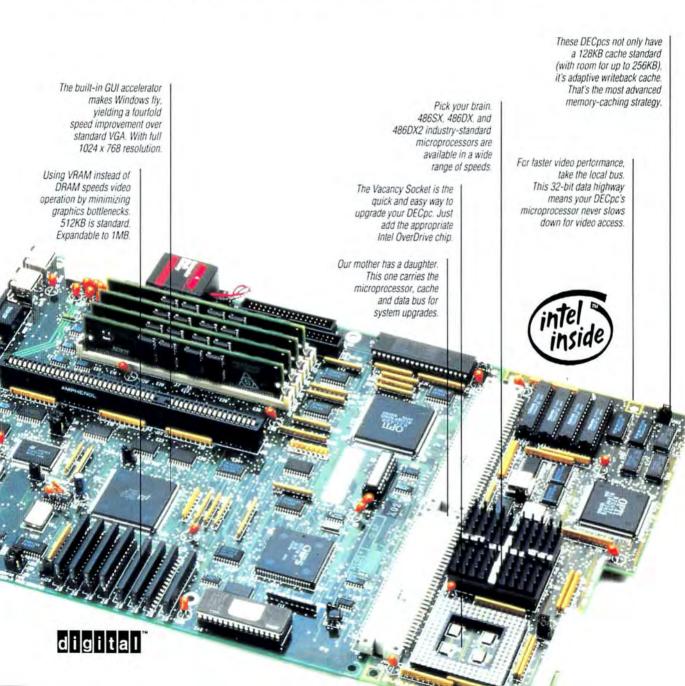


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Overall weighted score		3.6	3.5	2.4	4.0	2.8	3.4
1. Price vs. performance	(30%)	4	4	2	4	3	4
2. Performance	(25%)	3)	4	2	4	3	3
3. Expendability	(25%)	4	3	3	4	2	3
4. Serviceability	(10%)	3	3	2	4	3	4
5. Quality of construction	(10%)	3	2	3	4	3	3

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New Products

Hardware 83 | Software 88 | Connectivity 100 | Quick Takes 104

Orchid, Sigma Provide Audio With Your Video

In the rush of ever-faster, evermore-colorful graphics controllers entering the market, it's getting hard to tell one video board from another. Not so with a couple of recent products that give you sound in addition to speedy graphics.

Orchid Fahrenheit VA

The VA in the name stands for Voice Annotation. That's what Orchid figures business users want in the way of sound—the ability to add the audio equivalent of Post-it notes to documents in OLE-compliant Windows applications. The board comes with a microphone and cabling to connect it to your PC's internal speaker, and it has jacks for external speakers or headphones.

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Fahrenheit VA

Twice as fast as its predecessor, the Fahrenheit VA also offers voice annotation.

Orchid Technology 800/767-2443, 510/490-9312 (fax) List price: \$299 Reader service no. 646

WinStorm

WinStorm combines audio and video with a SCSI interface.

Sigma Designs 800/845-8086, 510/770-2640 (fax) List price: \$429 Reader service no. 647



THE \$299 ORCHID FAHRENHEIT VA is one of several new video boards that combine speedy, high-resolution video with audio capabilities.

ation of graphics accelerator chips. Orchid has also substantially improved its Windows video driver.

Orchid claims that between the new chip and the rewritten driver, the Fahrenheit VA is twice as fast as its predecessor, the Fahrenheit 1280. It can produce 16.8 million colors at 640 by 480 resolution and 256 colors at 1024 by 768 (with a 72-Hz refresh rate).

An ISA version of the Fahrenheit VA with 1MB of DRAM is available for \$299. Orchid also plans a VESA local-bus version of the board (using S3's S3C805 local bus chip), which it claims will be 30 percent faster than the ISA counterpart. The VL-bus board will be available in 1MB and 2MB configurations; Price was not set at press time.

Sigma Designs WinStorm

Sigma Designs has been a respected name in the high-end graphics market for some time, and its WinStorm video board upholds that reputation. Like the Fahrenheit VA, it combines audio and video capabilities on one card. However, the Win-Storm's sound capabilities are aimed at the higher end of the market. Unlike the Fahrenheit VA, which is more appropriate for such undemanding sound applications as voice playback, the WinStorm is capable of 16-bit audio—as good as your CD player at home. You also get interfaces for a SCSI CD ROM and a MIDI connector. Sigma says the board is compatible with SoundBlaster, Pro Audio-Spectrum, and other popular soundboards.

The WinStorm delivers the latest in video performance: 24-bit color with 16.8 million colors at 640 by 480 resolution and 256 colors at 1024 by 768, all at a flicker-free 72-Hz refresh rate.

The WinStorm lists for \$429 and includes a collection of multimedia software.

-Dan Miller

Hercules Joins the Accelerator Race

Hercules was one of the original big names in the graphics controller market, but in recent years it has been content to produce fast, high-res video boards (with prices to match) for CAD and specialized graphics apps.

With the introduction of the new Hercules Graphite board, however, the company appears ready to move back into the graphics mainstream.

Despite its relatively low price—\$399—the Graphite reflects Hercules' experience at the high end. It uses a 32-bit, high-speed RISC graphics processor and a sophisticated video memory subsystem. Like other video accelerators, the Graphite off-loads such functions as line drawing and bit-block transfers

from the CPU; it also handles jobs like shading and dithering.

The board can produce 16.8 million colors (at 640 by 480 resolution) and resolutions up to 1280 by 1024 (interlaced, with 16 colors). At 1024 by 768 resolution, the Graphite supports a vertical refresh rate of 80 Hz—well above the norm.

-Dan Miller

Hercules Graphite Card 32-bit graphics processing.

Hercules Computer Technology 800/532-0600, 510/623-1112 (fax) List price: \$399 Reader service no. 648

Hyundai and Gecco Roll Out Local-Bus PCs



HYUNDAI'S NEW VL-BUS PCs range from an entry-level 25-MHz 486SX (\$1799) to a 66-MHz 486DX2 (\$2995).

Two very different companies are taking a similar approach to designing systems that conform to the VESA local-bus standard. The U.S. arm of the South Korean Hyundai conglomerate and tiny Gecco Com-

puters have both introduced low-priced VL-bus systems that offer a 32-bit-wide high-speed local-bus slot for enhanced performance.

Hyundai is selling VL-bus computers in almost every color of the 486 rainbow, from an entry-level 25-MHz SX to a clock-doubled 66-MHz DX2. The \$1799 425S starts things off with 4MB of RAM expandable to 64MB and a 120MB hard drive. At the high end is

Hyundai's \$2995 466D2 with 8MB of RAM expandable to 64MB and a 360MB IDE hard drive. Both systems have 128K of secondary cache.

All the Hyundai 486 systems include a VL-bus-compatible

ATI Ultra Pro accelerator board preinstalled in the lone VL-bus slot. Desktop models feature six ISA expansion slots, seven drive bays, and two floppy drives.

Gecco Computers is shipping a 66-MHz VL-bus tower system for \$2995 and a desktop 33-MHz EISA system for \$2290. The Gecco 486VL-66E has 8MB of RAM expandable to 64MB, a 245MB hard drive, and 256K of secondary cache. The system's hard disk runs off a 32-bit EISA IDE controller; the VL slot can be used for video.

The tower model offers eight drive bays, eight expansion slots, and a 250-watt power supply. Besides the lone VL-bus slot, the 486VL-66E has three ISA and four 32-bit EISA slots. The system is built to manage the notoriously hotheaded 66-MHz 486DX2 chip, with a two-speed, heat-sensitive fan and a CPU-mounted heat-sink/fan.

Both firms include strong

support packages. All Hyundai direct-mail customers receive an 18-month system warranty, 12-month on-site service, and free 24-hour phone support. Gecco provides two years of onsite service for its systems and a two-year parts warranty.

-Michael Desmond

VL-Bus systems

Two EISA-equipped VESA local-bus models from Gecco and affordable 486 VL-bus computers from Hyundai.

Gecco Computers 800/486-0386, 602/967-3610 (fax) List price: \$2290 and \$2995 Reader service no. 650

Hyundai Information Systems 800/933-3445, 408/473-9349 (fax) List price: \$1799 to \$2995 Reader service no. 651

Extra Battery Gives Panasonic Note a Double Life

New low-voltage chips, innovative energy-efficient designs, and advanced power-manage-

CF-1000

Panasonio's power-saving notebook includes a removable floppy drive, an extra battery pack, and AMD's low-power AM 386SXLV chip.

Panasonic Communications & Systems Co. 800/742-8086 List price: with 60MB hard drive \$2299, with 120MB drive \$2699 ment software mean you get more life from today's notebook batteries. Nowhere are these gains more evident than in Panasonic's new CF-1000, a powerstingy, 5-pound notebook with a removable floppy drive. Pop out the floppy, pop an extra battery pack in the now-empty bay, and the CF-1000 will run from 6 to 11 hours between charges, Panasonic claims.

Without the extra battery, the CF-1000 should run from 3 to 5½ hours, depending on usage. Like many newer notes, the CF-1000 uses nickel metalhydride batteries that recharge in about 2 hours. Power-saving

innovations include AMD's 25-MHz AM 386SXLV microprocessor. Designed for notebooks, this low-power, 386SXcompatible chip draws 3.3 volts of power instead of the 5 volts conventional processors need.

The CF-1000 offers most essential notebook features, including a sidelit, 9%-inch LCD VGA display and a 60MB or 120MB internal hard drive. AddStor's preinstalled Super-Stor disk compression utility greatly increases (in some cases even doubles) your disk's storage capacity. The unit comes with 4MB of RAM, expandable to 12MB. The 84-key key-

board's dedicated <Home>, <End>, <Page Up>, and <Page Down> keys are a nice touch for speed typists.

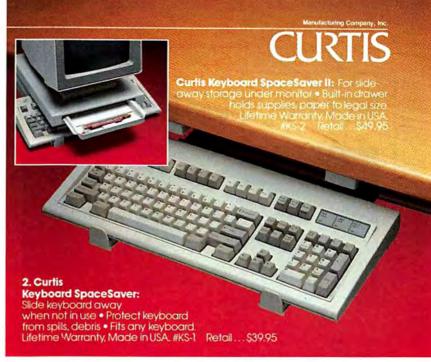
The CF-1000 is just 1¼ inches thick—a pleasure for travelers. With a travel weight of 6 pounds (including an AC adapter, an extra battery, cables, and a carrying case), the CF-1000 isn't the lightest portable, but its dual batteries and low-power design give it more staying power than most.

The CF-1000 with a 60MB hard drive costs \$2299; the 120MB model is \$2699. An internal fax-modem costs \$190.

-Jeff Bertolucci

Reader service no. 649









Reclaim Your Desk Today with SpaceSaving Accessories by Curtis

Is your computer crowding you out of your own desk?
You don't need a bigger desk – you need Curtis SpaceSaving Accessories.

1. Use the ingenious Top Shelf™ tray system to store paperwork on top of your monitor. 2. The Keyboard SpaceSaver lets you slide your keyboard away under your desktop or monitor. 3. The Universal Printer Stand stores paper underneath your printer and stacks printouts in a detachable receiving tray.

4. Use the Universal System Stand to store your CPU vertically on the floor.
And they all come with Curtis' Lifetime Warranty. So get Curtis SpaceSaving Accessories and reclaim the space that once was your desk.

Curtis products are available worldwide. For more information call 1-800-955-5544 Ext. 240



NEC's Ready Systems Offer Rapid Setup



EACH NEC READY SYSTEM comes ready to run with preloaded software, a 2400-bps fax-modem, and your choice of a 386 or 486 microprocessor.

Small businesses and home users will appreciate NEC's new Ready systems: three software-loaded PCs that are quick to set up and backed by the company's helpful remote assistance. These plug-and-work PCs are simple to get up and running in under half an hour.

A videotape shows the components of the system and how to put them together. Plug in the system, and a preloaded software tutorial with colorful graphics explains everything from components to keyboard techniques. More experienced users can skip familiar sections.

NEC's \$1199 386SX-based Ready 325 has a 120MB hard disk drive and 2MB RAM (expandable to 20MB); while the \$1599 486SX-based 425 and the \$1999 486DX-based 433 have a 170MB hard disk and 4MB RAM (expandable to 64MB). Prices do not include monitors. Along with Windows 3.1 and MS-DOS 5.0, the systems have a customized version of Norton Desktop 2.0 to make using Windows easy.

An extensive installed software group is one of the Ready systems' biggest advantages. Included are Prodigy, Norton AntiVirus, and PFS:Window-Works, which has word processor, charting, spreadsheet, database, address book, and label maker modules. Also included are 24 templates for smallbusiness balance sheets, sales projections, and commercial credit applications. To go with their built-in 2400-bps faxmodem, all the systems have Delrina's WinFax, which lets you fax from within applications. The 425 and 433 models also have Quicken accounting software.

Support includes a one-year on-site limited warranty and a toll-free hotline. But the real

bonus is the new Ready remote service, which lets NEC's support staff troubleshoot by modem. If a problem isn't solvable by phone, the user can pop in a remote support disk so the technician can dial into the user's system to analyze the problem and fix it.

The Ready 425 and 433 systems support 24-bit true color applications in 680 by 480 resolution and have three ISA expansion slots plus Intel Over-Drive sockets so you can upgrade to the new 50- and 66-MHz CPUs.

-Laurianne McLaughlin

NEC Ready Systems

Preloaded plug-and-work systems with a built-in faxmodem and a multitalented software group.

NEC Technologies 800/388-8888 List price: Ready 325 (386SX-25) \$1199, Ready 425 (486SX-25) \$1599, Ready 433 (486DX-33) \$1999; Ready 1024 monitor \$399 Reader service no. 652

Alphatronix Inspires Top-Speed Optical Drives

Magneto-optical (MO) drives are ideal for storing huge data files. Since their MO disks are removable, these drives are also useful for high-security government and business applications. And MO drives are becoming

Inspire II

New magneto-optical drives offer higher speeds and storage capacities up to 1GB.

Alphatronix 919/544-0001, 919/544-4079 (fax) List price: 650MB \$4495, 1GB \$4995 Reader service no. 653 increasingly faster and cheaper.

Alphatronix's new Inspire II 5½-inch MO drives continue this welcome evolution. With performance speeds approaching those of today's hard drives, massive storage capacities of 650MB or 1GB on each removable cartridge, and prices 40 percent cheaper than Alphatronix's first generation of MO offerings, these drives bring mass storage one step closer to the masses.

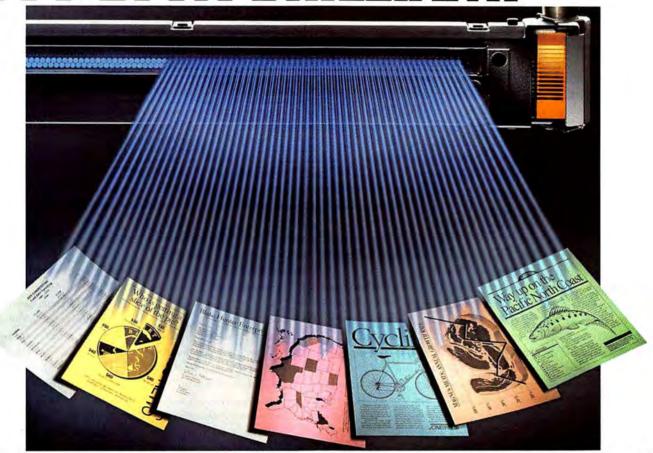
Alphatronix claims the Inspire II MO drives are among the fastest on the market, with average seek times as low as 23ms (outstanding for MO drives but slow for Winchesters, which typically score in the teens). The company credits several design enhancements for the speed boost: new lightweight heads that move faster across the disk, disks that spin at 3600 rpm rather than 2400, and new digital servos that keep the heads aligned at the faster rpms.

The Inspire II models, like all MO drives, are great for archiving data. Their removable, 5%-inch disks eject from the front of the unit, making reloading a breeze.

The Inspire II drives cost \$4495 for the 650MB model, \$4995 for the 1GB; they work with AT compatibles and PS/2s.

-Jeff Bertolucci

OKIDATA USES 2,560 BURSTS OF LIGHT TO MAKE YOU LOOK BRILLIANT.



If you think all laser printers are mirror images of each other, meet the one that broke the mirror.

built-in complications.

Okidata engineers flatly rejected the complex mechanism of rotating mirrors, focusing lenses and whirring motors that every major brand of laser printer depends on for its operation.

Instead, they designed a better way – a unique, solid-state LED printhead that precisely positions each one of 2,560 pinpoints of light, to produce a laser printer's brilliant output without a laser printer's

OUR BRILLIANT LED PRINTER LINE-UP INCLUDES THE IMPROVED-RESOLUTION OF INCLUDES THE full years*—the industry's longest. (After all,

moving parts, Okidata guarantees it for five full years*—the industry's longest. (After all, our printers have a reputation of reliability to uphold.) And we offer a full range of machines that can handle any workload from basic word processing to sophisticated business text and graphics.

To see how Okidata page printers can help make your business look brilliant, call 1(800) OKIDATA for the name of the dealer nearest you. And look brilliant yourself.

WE DON'T JUST DESIGN IT TO WORK. WE DESIGN IT TO WORK WONDERS.

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FoxPro 2.5: The Fastest Windows Database Looks Familiar

While most of FoxPro's competitors claim they're easier to learn and more intuitive, few of them can challenge FoxPro 2.5's performance and cross-platform compatibility.

This version of FoxPro represents round two in Microsoft's preemptive strike against Borland's yet-to-ship dBASE for Windows. The first update since Microsoft acquired Fox Software in mid-1992, FoxPro for Windows 2.5 and FoxPro for DOS 2.5 arrive almost in tandem with Microsoft's well-received and user-friendly Access database for Windows.

While Access hasn't earned bragging rights for performance, FoxPro shatters the myth that Windows application performance is synonymous with slow. Its remarkable Rushmore technology, already orders of magnitude faster than many competitors at solving most common queries, has been further tuned. Informal desktop previews show it dishing up multitable queries even faster than its DOS counterpart.

Looks Just Like FoxPro

FoxPro for Windows 2.5's most remarkable feature is what isn't new. Most new Windows versions of DOS software ambush loyal users with a totally reorganized interface. Fortunately, FoxPro's DOS predecessor already sported system menus in addition to its multiwindowed and mouse-aware screens; FoxPro for Windows 2.5 offers GUI variations on these very same elements.

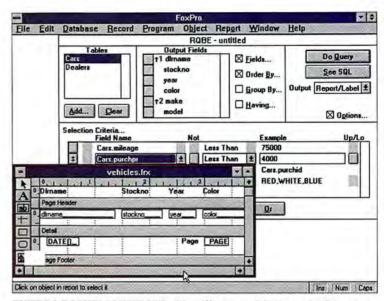
The system menu now conforms more closely to those of other Microsoft products. You'll immediately notice the system drop-down menu is gone; its bars, as well as many from the *Windows* drop-down, have been relocated to the program and help dropdowns.

Fox's RQBE query builder screen doesn't mimic a traditional query-by-example layout, but its structure offers more guidance than the SQL text editor dialogs often seen in Windows software. Fox's Report Writer lets you specify fonts and point sizes, while an added WYS-IWYG page preview zooms in and out and

also pages forward and back. Support for snaking columns is a bonus.

FoxPro's screen painter and label maker and its superb browse window closely resemble the DOS-based FoxPro 2.0, but they look spiffier, thanks to new fonts and graphics elements such as push buttons, check boxes, and scrollable lists that now have that steely, chiseled Windows look. The easyto-use applications generator, FoxApp, produces remarkably robust and usable applications, but you still have to write program files to enforce any serious data validation.

Remarkably, you can run old programs, such as those written with dBASE III Plus, Foxbase Plus, or dBASE IV. And if you like, FoxPro for Windows 2.5 will run character-based applications dutifully without modification. But here's the amazing part: Using a cross-platform transport utility, you can bring old FoxPro for DOS applications into the Windows world by



FOXPRO 2.5 COMES TO WINDOWS with spiffy new push buttons, check boxes, and scrollable lists, while keeping much of the look and feel of the DOS version.

replacing old DOS screen elements with check boxes, buttons, shaded fields, and other GUI accoutrements.

Window Shopping

Most other new assets, such as the support provided for the Clipboard, DDE, and OLE, are contributed by Windows. You can place a document (or sound, images, even a video clip) in a memo field of a FoxPro data file. Double-clicking on such a field launches the associated application and opens the document. More subtle benefits wait in utilities like spelling checkers and graph engines, which attach effortlessly to FoxPro via Windows Dynamic Link Libraries without adding to FoxPro's size or complexity. You can even hot-link data between an Excel spreadsheet and a FoxPro data file, though you'll have to write the DDE commands.

For those willing to master FoxPro's programmable extensions to the dBASE language, the program provides a sturdy platform for complex multifile database work. If you wish to build applications without programming, however, its command-based architecture won't get you as far as fast as Paradox for Windows or Microsoft's own Access. But when it's time to get a handle on those really big data files or to construct a single application for DOS and Windows users, FoxPro 2.5 offers a very attractive solution.

-Alan Schwartz

FoxPro for Windows 2.5

■WINDOWS ■ The fastest data manager in Windows is not for novices, but it offers a cross-platform transport utility that trades DOS screen elements for Windows accoutrements.

Microsoft Corp. 206/882-8080, 206/635-7190 (fax) List price: \$495, additional \$425 per user Reader service no. 654



The new LaserJet 4 has arrived. Pacific Connect Xi lets you share the good news.

If you'd like more information on the best way to share your LaserJet printer, or about our Pacific 4 SIMM Memory™ upgrades for the LaserJet 4, call Pacific Data Products at (619) 625-3567, Fax (619) 552-0889.



Find and Retrieve Documents on Any Server With PC DOCS OPEN

PC DOCS OPEN

OPEN brings sophisticated, LAN-based document management to Windows.

PC DOCS, Inc.
800/933-3627,
904/942-1517 (fax)
List price: \$295 per LAN node
(five-node minimum)
Reader service no. 655

Sharing data files over a network can be a disaster waiting to happen. Once you've tracked down every revision of a file, you've still got to figure out who did what to which. And when you've got data sitting on servers all over the globe, the problems multiply like bacteria. That's where programs like PC DOCS OPEN come in.

PC DOCS OPEN lets you locate and retrieve documents from any server hooked to your network—whether it's down the hall or in Tokyo. And unlike its previous, NetWare-only DOS incarnation, the \$295 Windows-based DOCS works with all major LAN systems, including Banyan's VINES and Microsoft's LAN Manager. It's also compatible with virtually any SQL-based database and a variety of storage devices, including tape and optical drives.

DOCS installs directly into the menu bar of major Windows applications, including Win-Word, Ami Pro, and 1-2-3. Or you can run it as your Windows desktop, launching applications from file lists and clicking on icons to retrieve files, create project folders, and view, print, or fax documents.

To track a document, you start by filling out a profile with the file name, author, client information, and other data, then store the document in a project folder. DOCS keeps tabs on who's opened the document, what they did to it, and when, as well as keeping track of any notes they've attached. Security features let you control access.

Need to find a file in a hurry?

DOCS' Quick Retrieve function provides a list of the last 20 files you opened and lets you view the files or launch their associated apps with a click. To find a file not on the list, you fill in a customizable query-by-example form—essentially a profile dialog box—and specify search parameters, which you can save and reuse. DOCS will then display a list of all files that meet your criteria.

-Daniel Tynan

CA Updates Accpac Line

Hoping to capitalize on the growing interest in international trade, Computer Associates has released version 6.1 of its Accpac Plus accounting package with support for multicurrency accounting built into the general ledger. Among the features are support for unlimited foreign currencies, automatic revaluation of fluctuating exchange rates, and account balances in multiple currencies.

Also new are a Purchase Order module for preparing and tracking purchase orders, and DynaView, an add-on analytical tool that links Accepae Plus data with SuperCale and 1-2-3 spreadsheets for preparing consolidated financial statements, creating reports, and analyzing financial data.

Acepac Plus 6.1's General Ledger and new Purchase Order modules cost \$795 each; users of the previous version can upgrade the General Ledger for \$99 through authorized resellers. Acepac Plus DynaView sells for \$249. Acepac Plus 6.1 requires DOS 3.1 or later, a hard drive, and 640K of RAM.

Also new from Computer Associates is version 2.0 of Accpac Simply Accounting, the company's entry-level Windows accounting package for small businesses. Version 2.0 includes support for cash-basis accounting, dynamic data exchange for linking accounting data with other Windows files, support for color, and improved forms handling. Simply Accounting retails for \$199; upgrades are \$75 from Computer Associates. Acepac Simply Accounting requires Windows 3.1 or later.

-Roberta Furger

Accpac Plus 6.1, Accpac Simply Accounting 2.0

Multicurrency accounting tops the list of new features in Accpac Plus.

Computer Associates Int'l 800/225-5224
List price: Accpac Plus \$795, upgrades \$99-\$295; Accpac Plus DynaView \$249; Accpac Simply Accounting \$199, upgrades \$75
Reader service no. 656

America Online Gets a Fresh Look

America Online for Windows

Online for Windows makes it easy to navigate the service and multitask with other Windows applications.

America Online, Inc.
800/827-6364
Cost: Software free to AOL
users; AOL service \$7.95 per
month plus 10 cents per
minute after first 2 hours
Reader service no. 659

America Online for Windows' colorful interface brings you the comforting familiarity of Windows and several new features designed to make your on-line session more productive.

A handy button-based tool

bar across the top of the screen allows you to move through the service with ease. You can click on buttons in America Online for Windows to access each of the service's seven departments, the file download manager, and several search options. No matter how many levels deep you are in one area, you can switch instantly to another by clicking one of the buttons, all of which always remain on screen.

By March the software should include 9600-bps modem access. AOL for Windows is free to current America Online users. New members get a one-time, 5-hour free trial period. The standard charge is \$7.95 per month plus 10 cents per minute after the first 2 hours.

-Anita Hamilton

Get a hold of the best value in LAN power protection

Back-UPS

merican Power Conversion

Now just \$139! suggested list price

Blackouts, brownouts, sags... Your data and hardware are vulnerable to problems that surge suppressors and power directors are just not equipped to handle.

Now there's a complete Uninterruptible Power Supply solution to suit any budget. The Back-UPS™ 250 is reliable protection for LAN nodes, 386SX machines, 286, small PS/2 systems, and internetworking hardware such as routers. bridges, gateways and repeaters.

From the largest server to the smallest router, the Back-UPS Series will increase your productivity by providing a costeffective solution to power problems. Call for your free power protection handbook.

The Back-UPS 250 offers even more cost-effective protection for LAN nodes (typical runtime for a 386SX system is 10 minutes).



- ABSOLUTE™ Protection guarantees repair or replacement of equipment (up to \$25,000) if damaged by a surge while protected by a properly installed Back-UPS (See warranty for details).
- UL, CSA and Novell approved with a 2 year warranty
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 - Ask about PowerChute® UPS monitoring software and Novell compatible UPS monitoring boards
 - 230V models available





The Back-UPS

by American Power Conversion (800)800-4APC, Dpt. P3

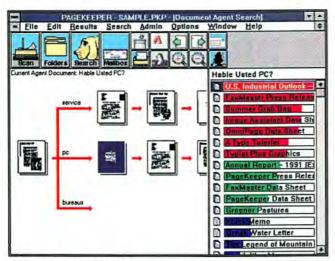
APC 132 Fairgrounds Road, West Kingston, RI (401)789-5735 APC Europe TEL: (+33)1.64.62.59.00 FAX: (+33)1.60.17.80.29

New List Model Application \$139 LAN nodes, 386SX, 286, internet hardware, POS Back-UPS 250 Desktop 386, 486 systems, 286 servers \$229 Back-UPS 400 \$279 Back-UPS 450 Tower 386, 486 systems, servers Heavily configured systems, CAD/CAM workstations \$449 \$399 Back-UPS 600 \$599 Multiple systems, longer runtime applications Back-UPS 900 NEW! Multiple systems, LAN hubs, small minis, telecom \$799 Back-UPS 1250 equipment

NEW!

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PageKeeper Retrieval Software Brings Your Files Back in Order



RETRIEVAL MADE EASY: Caere's PageKeeper color-codes files by order of relevance and graphically represents files on related topics.

The average size of the PC hard disk is growing rapidly, making it harder for you to find the right information among all the downloaded, typed, faxed, and scanned files in your desktop haystack. But with Caere's PageKeeper, you can instantly

find the files you want.

This Windows-based information manager brings a combination of unique technologies to bear on the problem—an expert system to retrieve and order files, file compression and OCR to save space, and agents that can round up related files.

PageKeeper starts by automatically indexing the files already on your hard disk—or for that matter, on all the hard disks you'd care to designate on your network. PageKeeper analyzes the grammar and syntax in each file to identify all significant words (not just nouns) and their relative importance.

The only RAM overhead is the index file itself, but that is more than compensated for by Caere's SuperCompression technology, which moderately compresses text and saves images in a fraction of the space they would require otherwise. When you scan or fax in a document, Caere's OmniPage OCR technology automatically converts it from the typical 1MB bit map to a 30K to 50K word processing file (if you select that option) for considerably greater space savings.

At search time, *PageKeeper* analyzes each match based on the degree to which keywords predominate and presents its findings accordingly, so you start with the document that has the greatest number of references.

Because *PageKeeper* can fathom each document's content, you can specify one document and *PageKeeper* will retrieve others with related information.

The program lists for \$895.

-Mike Hogan

PageKeeper

tion manager that helps you find text and graphics files.

Caere Corp.
800/535-7226,
408/354-2743 (fax)
List price: \$895, five-user
pack \$1995
Reader service no. 657

Three Windows Utilities Help Manage Your System

System management for everyone, that's what Attitash Software delivers with a triple play of affordable utilities aimed at streamlining Windows. Wide-Angle 3.0, SlingShot 2.0, and InfoPanel 1.0 help you organize your desktop, launch applications, and monitor your system

To simplify Windows multitasking, WideAngle 3.0, the company's \$59.95 screen expansion utility, now uses a metaphor that should be familiar to any television viewer—an on-screen version of a remote control unit. With this virtual clicker, you select and move among fullscreen applications as nimbly as a channel surfer in a LazyBoy. Aside from the TV metaphor, other major refinements include support of hot keys for switching among DOS applications and drag-and-drop capability to set up channels.

WideAngle comes bundled with SlingShot 2.0, a program launcher that's a steal on its own at \$9.95. SlingShot sits on top of Windows applications as a horizontal bar with a series of program icons and group names. To launch a program, you select the appropriate program group from a scrollable list and double-click the program's icon, or type in the first few letters of its name in a program bar.

SlingShot lets you create and

edit Windows Program Manager groups or replace the Program Manager altogether. You can also create your own groups of frequently used applications to appear on the command bar.

Finally, InfoPanel 1.0 is a \$49.95 utility that lets you keep an eye on vital data such as free system resources, remaining disk capacity, and the status of system ports. Similar to Hewlett-Packard's Dashboard, it displays data using gauges, meters, and "oil lights."

InfoPanel goes beyond passive monitoring. It checks your hard disk for viruses by tracking program size and warns you of altered files. While no substitute for a full-featured antivirus package, it constantly guards against infection.

-Michael Desmond

WideAngle 3.0, SlingShot 2.0, InfoPanel 1.0

Software delivers a trio of easy-to-use utilities designed to make Windows better.

Attitash Software, Inc. 603/882-4809, 603/882-4936 (fax) List price: WideAngle \$59.95, SlingShot \$9.95, InfoPanel \$49.95

Reader service no. 658

Introducing CONNEXPERTS'. NET Solution.

A comprehensive network solution for non-technical businesspeople.

Our NET Solution is a family of networking products that includes all the elements needed for most networking applications. Based on a breakthrough networking technology called ACTLAN™, the NET Solution makes networking accessible to the average businessperson without compromising performance or compatibility with industry standards.

Up to

255

users

Consider first our Intelligent Network Connection Card, pictured here. Installation of this card does NOT involve selecting interrupts, I/O ports, shared memory locations or any of the other technical details one must tackle with all other network cards. Yet,

despite the no-brainer installation, this card is more powerful and capable than any other network card available. Sounds like hyperbole; but as you read

on you'll agree. For example: these cards form a peer-topeer network capable of providing printer sharing, E-Mail

and PC-to-PC file transfer services WITHOUT requiring a network operating system. Just plug them in and you've got a network.

That's for starters. The NET Solution employs a building-block approach to networking. If you want "file sharing"-where everyone can access a shared database or run programs from a central server-add our NET Solution Network Operating System. It is a complete NetBIOS-based peer-topeer network operating system (NOS), featuring DOS and Windows® interfaces. Being 100% Microsoft Network Compatible, it dovetails with Windows seamlessly.

Or, if you prefer to use another NOS—for example: any Novell Netware®, or Windows for Workgroups®-our optional driver software makes it possible. This is the

beauty of our NET Solution 77,000 cps print Network Connection Card: server built-in you can begin your network using the cards alone, with the option of

No NOS required, but can be used with most

moving up to peer-to-peer or client/server networking by just adding software.

popular NOS's

Other NET Solution addons include network tape backup, CD ROM sharing, modem sharing, and FAX sharing. The NET Solution is all its name implies.

Network Co-processor relieves host PC of most network "work".

12 Megabits-per-second

transmission speed.

And speaking of names, we're the CONNEXPERTS... as in "connectivity experts". We've been inventing and manufac-

> turing connectivity products for over ten years, and everything we've learned is embodied in the NET Solution. If you are interested in a solid solution to your networking needs, connect with the experts. Call 800-433-5373 or FAX 214-239-6490.



Canvas for Windows: Top-Drawer Graphics

CorelDraw and Micrografx Designer had better take notice—there's a new gunslinger in the Windows illustration market, and it's aiming to become top draw. Deneba Software's Canvas, a leading illustration package on the Macintosh, comes to Windows armed to the teeth with top-notch design tools.

The \$399 program should grab the interest of professional designers, occasional CAD users, and even on-screen presenters. The ability of the Windows version to exchange files with its Macintosh cousin is good news for shops that split graphics duties between platforms. Best of all, Canvas's unique modular design lets you

turn off the tools you don't need, enhancing speed and conserving system resources.

Canvas packs all the essential image-creation tools, plus extras like the ability to blend multiple objects and to work with scanned images as well as line drawings. Desktop publishers will appreciate the support for Pantone colors and CMYK color separation.

But Canvas's firepower does not stop with pictures. You can automatically fit text inside a shape or wrap it around multiple objects on a page—a cool tool for creating flyers and brochures. And you can import PostScript or TrueType fonts and convert them to Bézier curves for creating logos and special text effects. (However, you can't export your custom text as a scalable font as you can with *CorelDraw*.)

Canvas's precision illustration tools blur the line between traditional drawing and 2-D CAD packages. You can place objects in increments of 18,5000 of an inch and designate an unlimited number of layers. You can even search for objects, patterns, and colors within a multilayered drawing, which makes it easy to, say, replace all the blue triangles with green trapezoids.

Finally, designers who need to present their handiwork to clients or co-workers can use Canvas's layering capabilities to create simple on-screen slide shows, complete with OLE links to live data.

While not for graphics greenhorns, *Canvas* gives old design hands all the tools they need for creating professional images.

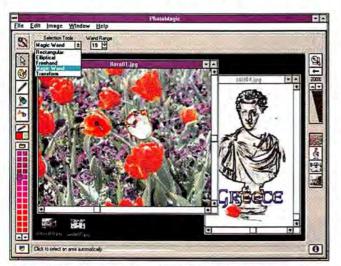
-Daniel Tynan

Canvas for Windows

Macintosh illustration package brings its graphics power to Windows.

Deneba Software 800/622-6827, 305/273-9069 (fax) List price: \$399 Reader service no. 660

PhotoMagic Makes Image Editing a Snap



CLICK ON THE RED FLOWER with PhotoMagic's Magic Wand, and you select the entire flower—a faster way to copy or change an image.

Image editing was once the realm of publishing professionals or at least those willing to spend large sums on software for the purpose. No more. Micrografx, creator of *Picture Publisher*; has entered the low-

end image editing market with PhotoMagic for Windows, a fully capable image editor that hovers just behind Picture Publisher in capability and lags far behind it in price, at just \$149.95.

Anyone disinclined to learn

new software will appreciate the coaching *PhotoMagic* offers. Move the cursor over any of the tools or buttons, and a cheat sheet appears at the bottom of the screen.

Since a major obstacle to image editing is the time and expense of scanning images, PhotoMagic ships with 250 24-bit color photos, organized by subject. To track these images, you get an image browser that creates thumbnails-even of images compressed in the JPEG format-so you don't have to rely on cryptic file names. Just click on the thumbnail to open the file. And of course, PhotoMagic supports all scanners through the TWAIN file format standard. It also supports Kodak Photo CD.

Image-editing tools include smooth, sharpen, and contrast, as well as some nice effects like wind, wave, twirl, pinch, punch, and splatter. And to speed up altering photos, you can preview an effect before enduring the slow, CPU-intensive act of implementing the change.

PhotoMagic does masking, lets you select image areas by color, and provides the usual ellipse, rectangle, and freehand selection tools. It doesn't do color separation.

-Christina Wood

PhotoMagic for Windows

■ WINDOWS PhotoMagic is a powerful, easy-to-use image editor that won't ravage your wallet.

Micrografx, Inc. 800/733-3729, 214/994-6475 (fax) List price: \$149.95 Reader service no. 661

GBASE IV Why it's smarter to go with #1



Now there's an easier-to-use, faster and more powerful dBASE.* It's packed with the features you've asked for most, making it smarter than

ever to use the world's standard PC database.

Working smarter is faster

With new dBASE
IV,® you get the job
done faster because you
work smarter. Smarter
because new IQ!™ optimization
technology automatically selects the
fastest method to retrieve your data.
Smarter because you can create tables,
forms, reports, queries and menus in
record time—without programming.

Smarter because you get 40 different work areas for easier management of large applications. Plus mouse support for fingertip access to features, an enhanced RUN function to run popular DOS applications from within dBASE, and comprehensive multiuser capabilities. All of which means you maintain tight data integrity, more flexibility and more support than ever before.

Advanced design tools build applications faster

dBASE IV's easy-to-use Control Center comes complete with an innovative set of design tools, including report, form and label generators that help you create your applications quicker. And the Control Center's open architecture makes it easy to enhance or customize your own applications by incorporating any of the third-party add-on products available for dBASE.

Faster applications development

The industry-standard dBASE language comes with a host of improvements that speed development:

- Integrated debugger and a built-in applications generator
- More than 40 new commands, functions and keywords—Template Language now included
- C language-like low-level file I/O
- IBM® SAA-compliant SQL
- Advanced BLANK support

Being the standard means worldclass support

dBASE has outsold all other databases. With more than three million users and the world's largest community of custom application developers and trainers, dBASE supports your data management needs in ways only the worldwide standard can. Now it's smarter than ever to go with #1.

Get more than \$250 in software FREE!

Now with every purchase of dBASE IV v1.5 we're giving away a Protection Pack that includes Central Point Software's Backup and Anti-Virus programs, free* (retail value \$258). So you get the best database and the best data protection.

See your dealer today. Or call 1-800-331-0877, ext. 6464 for more information. In Canada call 1-800-461-3327

YES! Send me my free Pro Pack Software!

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dBASE IV v1.5 Serial #	
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Company:	
Address: (We cannot ship to P.O. Boxes.)	
City/State/Province:	
Zip/Postal Code:	
Phone: ()	FAX: ()
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COMPLETE this coupon, ATTACH a copy of your sales receipt (or a copy of purchase order and billing invoice) AND ENCLOSE \$9.00 U.S. for shipping and handling (check or money order payable to Borland international, Inc.).

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Offer good in U.S. and Canada only on dBASE IV v1.5 purchases between June 1 and September 30, 1992. Only original coupons will be accepted No responsibility is assumed for lost, late, madicreted or destroyed mail. Please allow 4–6 weeks for delivery. Subject to all local, state and federal regulations. Void where prohibited. Offer not valid for Upgrades, Competitive Upgrades, LAM Packs, Volume Packs, or any other Bortand promotion except dBASE IV v1.5 products with Bortand's Passport promotion. Distributors and resellers not eligible to participate. Central Point is a registered trademark of Central Point Software.

BORLAND

Software Craftsmanship

Turn Any Fax Into A Scanner!

ntroducing a new era in truly portable computing: FAX SCANNER. This small 11%"×214"×34" wonder-device connects your computer and fax modem to any standard fax machine for incredible scanning power!!! This system is the best solution we've ever seen for top-quality full page scanning for fax purposes. The superb gray-scale images and crisp, clear text are simply unbeatable.

Scan a full 11"×17" size (depending on your fax machine) with the included software.



FAX SCANNER

Electrifying Digital Art

magePals combines Image Capture, Enhancement and Management. The most imaginative set of painting and special effects features we've ever seen.

You'll paint, color correct, apply filters,



stitch images, resize, resample, rotate and much more. Images can be captured from just about any source: scanners, digital cameras, video frame grabbers or Photo CD.

IMAGEPALS

BDO4802 ImagePals Dual Media . . \$199.00

Ad Lib Sound!

A new stereo sound adapter from the PC audio champions. Ad Lib has come up with the perfect board for the multimedia age, including advanced recording, playback and sound integration features. This is a completely new design, providing 22 independent stereo voices to produce

dynamic music, stunning sound effects a n d superb speed reproduction



The innovative FM synthesis delivers clean, crisp instrument sound and the 12-bit digital recording captures any sound source with lifelike clarity.

FREE Ad Lib Gold Software! Once you dive into this incredible sound system, you'll want to push it to the limit — that's why Ad Lib includes a treasury of audio software to play with: Voice Pad records and plays back audio memos and enables you to create voice alarms. JukeBox Gold enables you to select and play back Ad Lib Gold tunes. Includes a Music Clip Library with a wide variety of selections for your listening pleasure and for use in presentations and multimedia productions.

AD LIB

BDO3231 Ad Lib 1000 SCSI	
Adapter	\$59.95
BDO3232 Ad Lib Gold 1000	.\$199.95

ADA-Ready Policies And Job Descriptions.

Here are two indispensible products for managers, small business owners and executives, both ADA-compliant. The first is the award-winning Personnel Policy Expert, enabling you to quickly create employee handbooks. It covers 66 policy topics — you simply fill in specifics — Personnel Policy Expert takes care of the rest. The second is ADA-ready

DescriptionsWrite Now! helps you create clear, complete job descriptions — covers 2300 job titles.

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BDO3908 Policies Write Now! and Descriptions Write Now!\$259.00 Please specify dishette size when ordering

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This year, do your taxes the easy way! Turbo-Tax is the best selling, most honored tax software — DOS or Windows versions available. Includes new Easy Step feature for fast returns. Bonus! Includes Quicken, Personal Lawyer, CheckFree and free modern (directly from CheckFree when you sign up for the CheckFree service). Over \$255 in total value

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Checkfree when you sign up for the Checkfree service.

New! Fax Master.

The complete fax product. Turns ordinary faxes into "intelligent faxes." Send, receive, save and edit faxes — all with sleek. WYSIWYG display.



Convert faxes instantly into useable text — what a time saver! Broadcast faxes to 20 dif-

A full phonebook that sends a fax to a frequent contact with one click! Fax paper documents with a number of supported scanners. Even pre-schedule fax transmissions at your convenience. You'll be alerted when an incoming fax has arrived, then access it by clicking on Fax Master from within any Windows application. Edit your fax, and send it back — right from your screen! See your faxes in handy "thumbnail" format.

New! OmniPage Direct.

A n easy to use, low-cost OCR package that actually teaches your Windows applications how to read. It works within your application — right from your your software's File



menu. The text appears in your document just as if you had typed it yourself. Omni-Page Direct is the easiest OCR in the world; it's virtually automatic! Just point and click to recognize a paragraph or multiple pages. Call Tiger for the product that suits your particular needs.

BDO3655B OmniPage Direct \$269.95 BDO3656 Fax Master \$179.95

Lotus Organizer.

The Organizer is a very powerful, very easy-to-use on-screen calendar, to-do list, planner, address book, notepad and anniversary reminder in one sleek tool. It's much more powerful than the manual planner you're using now, and it can be customized to work any which way you like—that's the beauty of it. Track your schedule, business contacts and work load—and feel right at home the very first time you use it. This one program will clear your desk by eliminating your calendar, Rolodex, address book, notepads, binders and Post-It Notes.

Lotus Organizer contains six tabbed sections that work together seamlessly to make you more productive. Entries can be instantly linked for fast cross-referencing. The Calendar displays your choice of day, week or two-week periods. You can include the durations of specific appointments to additional conflicts and set an audio/visual alarm to alert you in any Windows application. Even supports e-mail!



LOTUS ORGANIZER

BDO5185 Lotus Organizer . . \$99.90 286 or higher running Windows 30 or higher, 3MB of hard disk storage, VGA monitor and Mouse.

Transfer Files From Laptop To Desktop @ 3MB Per Minute!

Levery laptop user must be able to get files to and from a desktop — fast. And nobody does it better than LapLink Pro. Let new LapLink Pro 4.0 use its "Synchronize" feature to



make two directories ident i c a l , transferring only the required files.

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BDO3524 LapLink Pro 4.0 \$109.95	
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1000% Faster CD-ROM?

Speedway is the first cache designed specifically for CD-ROM readers. It will dramatically increase the response time for any CD reader from any manufacturer by hundreds of times! Many CD-ROM

titles will run up to 2000% faster! In fact, we've clocked some titles at over 7000% faster! It's a new level of performance that will revolutionize the way you use your CD-ROM equipment.



CD SPEEDWAY

BDO8500 CD Speedway \$99.00 Requires 640k RAM.

Automatically Turn On Your PC When You Call It By Modem!

This best-seller is a must for anyone who uses a computer on the road, or at home as well as the office. With the price of pocket-sized, very fast modems coming down, remote computing is becoming a business

standard.
Now you
can call
from any
p h o n e
and turn
on any rem o t e
computer
(or any



other equipment for that matter), without the wear and tear or maintenance cost of leaving the equipment running full time.

With pcAnywhere, Carbon Copy, Commute or any other remote communication software you'll have total control over your remote computer. When you hang up, the equipment is turned off — all remotely and automatically. Remote Power On/Off works like this: Just connect the Remote Power On/Off unit to your office PC. Then, from your home or remote location, actually turn on the office PC and begin work.

SERVER TECHNOLOGY

BDO6300 Remote Power

Plan Your Trip With Voyager!"

oyager is a CD-ROM based route planning system for Windows that provides clear, reliable directions TO any place — FROM any place in North America. Want to go from Disney World to the Grand Canyon? Just tell Voyager and in seconds you'll have complete directions with detailed maps and a highlighted route.

Voyager includes megabytes of handsome, comprehensive maps like the ones you see on this page. You select the most direct route — or take your time, enjoy the drive and pick the most scenic route.

Planning a vacation or business trip is as easy as typing in your starting place and your destination. Voyager digs into its massive database of information, maps and statistics to provide an instantaneous route plan and points of interest along the way.



Brilliant maps from one of the world's most respected sources: GeoSystems

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800 Douglas Entrance, Suite 765, Coral Gables, FL 33134 VISA, MasterCard, American Express & Discover accepted All orders are shipped via Federal Express

Create Your Own Databases <u>Without Programming!</u>

R ight now, Tiger has been selected as one of the first in the country to premiere an updated version of this hall-of-fame software: **New Alpha FOUR Version 2.1.**

Create My Own Database Applications... Can I Do It?
That's what I asked myself when I thought about building my first application. Can I really do it myself? Or should I hire a programmer to do it for me?...

Best Value



Rated #1











Awarded for Version 1.1 — Rated #1, PC Week, May 14, 1990; Excellent Value, InfoWorld, May 22, 1989; Editor's Choice, PC Magazine, December 17, 1991; Readers Choice, DBMS, December 1991; Best Buy, PC World, March 1990.

Awarded for Version 2.0 — Top 200 and Best Value, P.C. Computing, June and August 1992; 3-1/2 Stars, Home Office Computing, September 1992; Top 100, P.C Souries, October 1992; Top 200, P.C World, December 1992, Readers' Choice, DBMS, December 1992; Readers' Choice, DBMS, December 1992; Readers' Choice, DBMS, December 1992; Editor's Pick, Home Office Computing, January, 1993; Best of 1992, P.C Magazine, January 1993.

At first 1 backed off and priced out some programmers. Wow! Never mind. I'll try and do it myself. After surveying the numerous products out there I finally found the absolute best tool for creating custom applications — without the complications and time needed for writing code. Alpha FOUR — the database for Non-Programmers like me.

Alpha FOUR's Tutorial was magnificent — the best I've ever seen. In a few short hours I had the basics under my belt. I created my first database, complete with a colorful, custom screen and field rules that even capitalize the first letter of each word. It was incredibly easy.

From there I made my first application. Nothing to it. Alpha FOUR let me "paint" my menu, so you know it has lots of colors and looks good. Each menu selection starts a stored sequence of keystrokes (called a macro). For example, the "Find Customer" menu selection plays back the keys for 1) go to edit mode, and 2) go to find mode. When you select my menu item, a little box appears asking you for the customer's name. You enter it and the record is instantly found and displayed. It was very simple to create. And my application runs directly from the DOS command line.



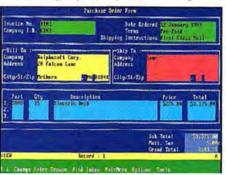
With Alpha FOUR I can create custom applications in a fraction of the time I spend with other programs. It's the fastest, easiest database program I've ever seen.

Alpha FOUR has relational capabilities too; that means it can link up to 10 databases all at one time and make it look like they are one big database. That's important because you don't want to enter data more than once. Look at the Invoice screen I made for Solar Video on this page. That's actually 3 separate databases: 1 for the invoice information, 1 for the customer information, and 1 for the tape information. If I didn't use a relational database, all that information would be in each invoice record. That would be one huge (and very slow) database. But with Alpha FOUR, I don't have to worry.

Know what I like most about Alpha FOUR? It seems every time I need something, Alpha FOUR is right there with the answer. It's always one step ahead. That's a good program. The kind that's perfect for people like you and me.

Speed, Speed, Speed, Speed — And More Speed!

...That's the big news in Version 2.1. Faster performance thanks to a new concept known as Bullet™ technology — that increases the speed of some indexes in Alpha FOUR by up to 70% over the previous version! Copy, export, global update, processeports and search faster than you ever thought possible. This Bullet technology is quite an impressive breakthrough!



Talk about ease-of-use combined with **power** — I can relate 3 database files together for my Invoicing application. Alpha FOUR gives me what I need for serious applications.

Data Entry Simplified — And Virtually Error Free! Streamline data entry with colorful, easy-to-follow screens that eliminate the chance of errors with Alpha FOUR 2.1 field rules. For example, Alpha FOUR 2.1 will automatically change letters from lower to upper case as you enter, or allow you to skip over certain fields unless specific conditions are met — even perform calculations automatically!

Alpha FOUR 2.1 also helps you speed data entry with a powerful look-up feature that displays possible entries for given fields—you simply select from the list to fill in the related information. For example, enter a part number and Alpha FOUR 2.1 automatically enters the corresponding description and price for you.

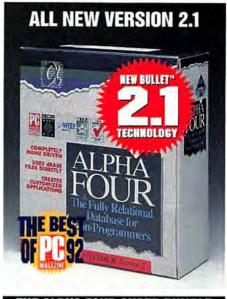
Totally dBASE Compatible. I was delighted to hear Alpha FOUR is totally compatible with dBASE. dbf files. Our mailing list went right into the new application without even having to be converted! And when my Alpha FOUR application grows, it'll import those Lotus 1-2-3 files used over in accounting. In fact, Alpha FOUR can import and export Lotus 1-2-3, Symphony, VisiCalc, PFS, MultiMate, WordPerfect.

Great Looking Reports Are An Alpha FOUR Specialty!

Hove Alpha FOUR 2.1's "What You See Is What You Get" report writer — with just a few menu selections, you can create custom screen and printed reports to fit any need: long text fields in multi-line columns with word wrapping. Or format numeric fields to print out as words for the "Pay this amount" line on your blank checks.

Alpha FOUR 2.1 also contains built-in layout editors to create professional quality (and fully customized) letters, invoices, announcements — virtually any document. Plus, with the FREE FormFiller 4.0 that we've included in this spectacular offer, you'll fill in pre-printed forms from your Alpha FOUR 2.1 database with the greatest of ease!

A Powerhouse Of Easy-To-Use Features... dBASE Compatible • Fully Relational • Menu-Driven Scripting • Over 80 Functions for Manipulating Data • Ability to Call and Pass Data to Other Programs • Instant DOS Access and more.



THE ALPHA FOUR SUPER BUNDLE

With the purchase of Alpha FOUR 2.1 you receive: All New FormFiller 4.0 — Just released and completely redesigned! The PC is a perfect tool to help you fill in forms. With FormFiller 4.0, your computer is precisely synchronized, so filled-in data is positioned in exactly the proper place every time. A master template of the form guides fill-in, reduces change for error — even checks for accuracy. FormFiller 4.0 is the premier forms fill-in software.

AND... Zip Code Database — A complete database containing over 41,000 United States zip codes, cities and states. Maintain your mailing list with surprising ease, print labels for massive mailings, even eradicate duplicates automatically. Anyone can benefit from this handy database. Not just a lightweight add-on, this is a fully functional application — and it's yours free with Alpha FOUR.



HERE'S WHAT YOU GET:

Total Value	\$603.00
FormFiller 4.0	worth \$149.00
Zip Code Database	worth \$49.00
Alpha FOUR (Single User)	worth \$495.00

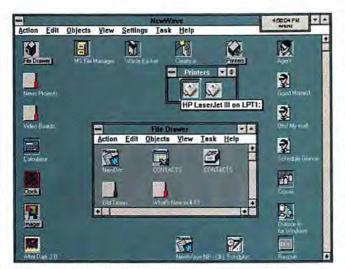
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You Get TWO Extra Network LAN Packs Inside Absolutely FREE! A \$1049 Value. Offer subject to change without notice.

BDO3450 Alpha FOUR Version 2.1 Non-Networkable with FormFiller 4.0 and Zip Code Database \$99.90 BDO3451 Alpha FOUR Network Pack Includes Network Server and 2 Network LAN Packs \$348.00 Please specify disknet give when ordering.

Performance, Installation Improved in Latest NewWave



NEWWAVE 4.1 OFFERS faster performance and installation while maintaining its familiar icon-based environment.

With NewWave 4.1, Hewlett-Packard has trimmed down, speeded up, and generally enhanced its powerful, object-oriented desktop manager. But despite simplified installation and better tools to manage the transition, HP's application

environment-turned-Windowsshell maintains its Himalayan learning curve. Still, it offers enough improvements that it may be worth the rocky journey from Windows to enjoy the program's powerful automation and file-management capabilities.

NewWave's philosophy holds that applications are simply a means to an end and that users should concentrate on data, not on the programs that manipulate it. New Wave replaces the familiar system of files and directories with objects and tools, creating a seamless, icon-based environment where you launch programs by clicking on the files created under them. While New Wave calls applications and their files objects, utilities that do not create and modify files, such as screen savers and the Windows calculator, are known as tools.

Faster performance and enhanced desktop operation are the key enhancements. Dragand-drop printing now supports multiple printers and even fax machines, and creating new application files on the desktop has been simplified to a click-and-drag procedure. New Wave

also offers fuller Windows integration, allowing users to open multiple files under a program and to save files created inside an application directly to the NewWave desktop. Finally, version 4.1 installs, loads, and operates faster than its predecessor and offers more guidance in configuring the system properly.

-Michael Desmond

NewWave 4.1

its object-oriented Windows desktop manager with a friendlier interface, better setup, and snappler performance.

Hewlett-Packard Co. 800/554-1305, 408/720-3560 (fax) List price: \$195, upgrades \$49 Reader service no. 662

Forest & Trees Reads More Data, Offers Better Interface

If you need to examine data from a variety of sources, linking and arranging it in different ways, you've probably considered buying Channel Computing's data access and reporting tool, Forest & Trees.

Intended for reading data but not writing it, Forest & Trees allows you to access a wide variety of data formats, link tables that may or may not have been designed to work together, and search on complex criteria. Forest & Trees for Windows 3.0 adds a wide variety of functions without changing the program's fundamental look or feel.

The first question with a program like this is, Can it read your data? The new Forest & Trees adds EDA/SQL, Hewlett-Packard Allbase, Excel 4.0, and Ingres data formats to its already substantial list, which includes dBASE, Paradox, 1-2-3, SOL Server, and Oracle Server.

Other new features affect what you can do with your data once you've gotten it. The new reporting engine makes two passes across your data, enabling you to put totals in your report headers and aggregate expressions within your report. You can now create cross-tab reports on the fly with summary figures summarized again. New drill-down capabilities let you uncover and examine details

below the generalized information. And you can define situations that will trigger actions for instance, you can have Forest & Trees send a prewritten Email message when inventory drops below a given level.

Interface improvements let you redefine reports and views with right-mouse-button popup menus and adjust column width with drag-and-drop resizing. A Query Assist feature joins tables automatically and creates Group By and Where clauses.

You can define views (predefined sets of the way data is shown on screen) with buttons, bit-mapped images, and hot spots. View groups can be hidden, and you can determine the features available to each user.

Forest & Trees is \$695 for the single-user version, \$790 for the client server.

-Lincoln Spector

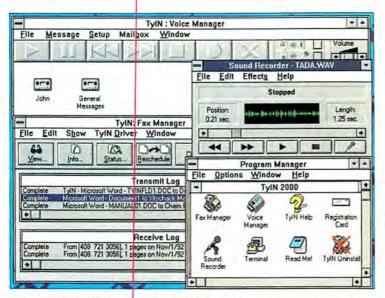
Forest & Trees for Windows 3.0

version of this data access tool reads more kinds of data and lets you do more with it.

Channel Computing 800/952-8779, 603/427-0385 (fax) List price: \$695 Reader service no. 663

IT WAS THE MOST SUCCESSFUL PRODUCT LAUNCH IN WINDOWS HISTORY.

TylN 2000 Communications System Ties Data, Fax, and Voice Together



READY FOR THE HOME OFF CE: The \$279 TylN 2000 voice/fax-modem comes with Windows-based fax, voice annotation, and answering machine software.

National Semiconductor is taking a bold leap into the competitive retail modem market with its new TyIN 2000: a featurepacked fax-modem with voice capabilities and Windows fax, voice messaging, and answering machine software. Targeted at the growing number of smallbusiness and home-office users who need an integrated, PCbased communications system, this PC add-in board offers a number of noteworthy features for \$279. It can detect incoming voice, fax, and data calls automatically, record incoming phone calls while you're working in another application, and annotate voice messages to spreadsheets and documents.

Audio and Phone Messaging

In addition to being a standard 9600/2400-bps fax-modem, the TylN 2000 offers a suite of tools for playing, recording, and sending voice messages. You can play back sounds through the board's integrated louds peaker or a telephone handset or, for

better sound quality, through an external speaker. To annotate business documents or to record voice messages to E-mail, you use TyIN 2000's Voice Manager software and a telephone hand-set or external microphone.

Audio recordings are stored in Windows WAV format, meaning you can send voice messages via the network or modem to colleagues who have audio-capable Windows PCs. The TyIN 2000 board records WAV files at 11 kHz and plays them back at 11 or 22 kHz—good enough for simple voice applications but not on a par with the 44-kHz CD-quality audio.

In addition to providing business audio, the TyIN 2000 turns your PC into a telephone answering machine. You can set up multiple mailboxes, each with a different greeting, so callers can direct their messages to the right user. Password protection ensures confidentiality, and a remote user at a touch-tone phone can call in for messages.

Compression saves hard disk

space by squeezing voice messages at a ratio of better than 2 to 1, National says. (The actual ratio depends on the amount of silence in each message. National estimates that a 1-minute phone message should fill about 200K of disk space.) The TyIN 2000 board does not compress WAV files, however, since that format currently has no compression standard.

National's expertise in designing digital answering machine

chips is evident in the TyIN 2000's ability to distinguish between incoming voice, fax, and data calls and switch to the appropriate receive mode. Unlike some fax-modems that require a distinctive ring service from the phone company to route calls, the TyIN 2000 does not require a distinctive ring, saving you money on your phone bill.

Fax From Windows

TyIN 2000 can send and receive faxes at 9600 bps, and it uses error correction and data compression to improve transmission. The product's Fax Manager software is fairly routine as Windows fax software goes, allowing you to send faxes from within applications by "printing" to the fax-modem. As with most fax software, you can create phone books of fax recipients, resend and reschedule faxes, and zoom in on fax pages for a closer look. However, the software lacks a number of the sophisticated tools for

image editing, cover-page design, and character recognition found in the latest fax packages, which you might use with the TvIN 2000.

The 2400-bps data modem is fairly routine. It works with any standard communications program, including Windows Terminal, and supports V.42bis for 4-to-1 data compression. The TyIN 2000 doesn't include data communications software.

Future-Looking Design

The TyIN 2000 doesn't skimp on power. Unlike bargain modems that rely on the CPU's processing power, National's card features a powerful 32-bit processor that won't slow your machine to a crawl when you receive a fax or voice message. Furthermore, it has an integrated digital signal processor that allows you to upgrade the board through software.

National Semiconductor isn't the only player in the data/fax/voice-modem market. Both The Complete PC and Prometheus Products offer similar products, and other manufacturers are expected to add voice to their fax-modems this year. However, it'll be hard for the competition to beat the TyIN 2000's combination of advanced technology and low price.

-Jeff Bertolucci

TylN 2000

This \$279 modem integrates data, fax, and voice features on a PC add-in board.

National Semiconductor 800/538-8510, 408/721-7662 (fax) List price: \$279 Reader service no. 664

IT SWEPT ALL THE MAJOR USER SURVEYS.

Integrated Fax and Communications for Windows

For good or ill, faxes have become essential tools of modern business communications, and modems that handle both data and fax are increasingly common. The latest incarnation of MicroPhone, Software Ventures' workhorse communications program, gives a nod to that reality by integrating fax abilities. MicroPhone Pro for Windows also includes a host of new features that take the pain out of on-line communications.

The product includes Win-Fax Lite, a version of Delrina Technology's hugely successful send/receive fax software packcall up the fax module, just click on an icon. One unique feature is the

program's ability to automate fax sending via an extensive scripting facility. You can write your own script, or use Micro-Phone's "watch me" mode to create a reusable script automatically. You can also use the fax module outside MicroPhone Pro to fax documents directly from any Windows application.

MicroPhone supports dragand-drop in a unique way. To transfer a file while you're connected on line, you simply drag and drop its icon into the terminal window. If you want to fax the document, drop the document icon onto MicroPhone's fax icon. Using MicroPhone's script facility, you can set up custom icons that will send the fax automatically to one or more recipients.

age. It's well integrated into MicroPhone Pro for Windows; to

-WINDOWS The latest version of a workhorse communications program includes fax capabilities and numerous new Windowsspecific features.

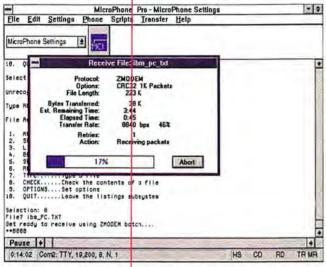
MicroPhone Pro for Windows

Software Ventures Corp. 510/644-3232. 510/848-0885 (fax) List price: \$195 Reader service no. 665

If your PC is set up for multimedia, MicroPhone Pro has additional surprises in store. If you drop a sound or picture file onto MicroPhone Pro's multimedia icon (a cassette), you'll hear or see the message.

MicroPhone Pro for Windows' straightforward user interface has an uncluttered basic screen and is a breeze to understand. The program retails for \$195.

-Stan Miastkowski



MICROPHONE PRO FOR WINDOWS' elegantly simple user interface is the door to a host of advanced fax and communications features.

Multiport I/O Board Saves Bus Slots

If your PC runs multimedia, scientific, or industrial applications, you've probably found the I/O bus slot a precious resource. Hook up an additional printer, tape and floppy drives, scanner, bar-code reader, digitizer, mouse, and modem, and suddenly you've got too many I/O cards and not enough slots.

One solution is the Port-Folio 550, a 13-port I/O board from Quickpath Systems that lets you connect multiple peripherals to a single AT-bus card Featuring four serial, four floppy, two parallel, one game, and two IDE ports, this multiport board can handle two printers, four

1.2MB or 1.44MB floppy drives, two IDE drives, a joystick, and four serial devices (such as modems and mice) simultaneously. This means you can fill free I/O slots with network, video, audio, SCSI, memory, and other boards.

In addition to freeing up valuable AT-bus slots, the Port-Folio 550 offers special benefits to Windows 3.1 users, thanks to four high-speed UART chips, which control the communications ports. Each is equipped with a 16-byte buffer designed to speed communications multitasking and reduce data errors. As a result, Windows 3.1 users can more reliably download files from a BBS while working in a spreadsheet, for example.

The Port-Folio 550 isn't for novices. The board comes with a daunting array of cables and brackets to connect multiple peripherals-intimidating for the beginner. Also, the product lacks a software diagnostic program to detect I/O conflicts during installation. On the plus side, Quickpath Systems includes software drivers for four floppies in case your PC's BIOS doesn't already support them. Also helpful is an easy-to-read diagram card that identifies the Port-Folio's 13 ports and supplies setting and address information for each.

The Port-Folio 550 has a list price of \$149, with street prices as low as \$120, according to Quickpath Systems.

-Jeff Bertolucci

Port-Folio 550

Multiport I/O bus board lets you connect multiple peripherals to a single AT-bus slot.

Quickpath Systems 800/995-8828, 510/440-7289 (fax) List price: \$149 Reader service no. 666

AND IT MADE A LOT OF PEOPLE IN REDMOND, WASHINGTON VERY UNHAPPY.

Quick Takes

Smart Label Printer Pro

Label printers may not be the most exciting peripherals, but they are among the most popular. Why? Just ask your local administrative assistant. Printing labels for envelopes and file folders, an everyday office task, is surprisingly difficult or standard office printers. Seiko Instruments, a major player in the label printer market, recently introduced an upgraded version of its leading product, the Smart Label Printer.

The new Smart Label Printer Pro adds support for wider labels. You now have your choice of labels for 31/2-inch disks and shipping or name tags. Sciko has also improved the printer's speed (up to ten labels per minute) and the quality of its thermal output (you can, for example, print scannedin photographs on name tags). In addition to the hardware improvements, Seiko is shipping new versions of its Windows and DOS TSR software, both of which can capture addresses on the fly from letters and route them automatically to the Smart Label Printer Pro. Smart Label Printer Pro (Windows/DOS version) \$299.95; Smart Label Printer Plus (DOS-only) \$199.95. Seiko Instruments, 800/888-0817, 408/ 433-3206 (fax).

Reader service no. 672

Micrografx ABC FlowCharter 2.0, Micrografx Windows OrgChart 2.0

grade in three years, Micrografx's ABC FlowCharter 2.0 adds a host of new tools for visually representing data flow, network layouts, manufacturing steps, and other processes. You

now get a choice of palettes with industry-standard shapes as well as the ability to mix and match shapes between palettes and to import graphics via Windows' Clipboard. Version 2.0 lets you link one flowchart to several others, so you can create charts for each part of a complex process and leap from one part to the next. The \$495 Flow-Charter comes with 14 True-Type fonts, and OLE support lets you embed charts in other Windows applications.

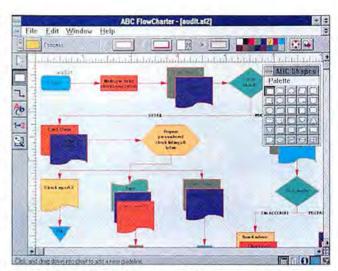
Windows OrgChart 2.0 adds tools that make it easier to create sharp-looking organizational diagrams. Simply draw one box, and add equal or subordinate boxes by clicking on directional arrows. You can attach notes or image files to each box and call up the data with a mouse click, mix different typefaces within each box, and print full-color charts with custom borders and drop-shadow effects. OrgChart 2.0 retails for \$149.95. Micrografx, Inc., 800/733-3729, 214/ 234-2410 (fax).

Reader service no. 673

CG-8000 ColorArtist Pro

Mustek's CG-8000 ColorArtist Pro is a hand-held color scanner that delivers 24-bit color images at up to 800-dpi resolution and complies with all three TWAIN formats. You can switch between 24-bit and 12-bit color and scan 256 colors or 16 degrees of gray, as well as halftone images and line art, at resolutions from 100 dpi up to an interpolated resolution of 800 dpi. For the list price of \$599, you also get Micrografx's Picture Publisher 3.1 LE, Perceive Personal Omnifont OCR from Ocron, and Mustek Slideshow. Mustek Inc.: 714/833-7740, 714/833-7813 (fax).

Reader service no. 674



GOING WITH THE FLOW: Micrografx ABC FlowCharter lets you create flow diagrams from predesigned palettes of industry-standard shapes.

Bernoulli MultiDisk 150

With the Bernoulli MultiDisk 150, Iomega delivers fast, removable-disk mass storage to PC users, MultiDisk 150 list prices start at \$1099; the unit comes in portable, internal, and dual-drive configurations. Supporting 35MB, 65MB, 105MB, and 150MB removable disks, it is the first Bernoulli drive to handle disks of various capacities, while its 19ms average access time means you get hard-drive-like performance. The 150 is also an attractive upgrade for Bernoulli users since it reads and writes to older Bernoulli 90 disks and can read from Bernoulli 44 disks. lomega, 800/777-6179, 801/778-3450 (fax).

Reader service no. 675

IronClad 2.0

work security without locking out users is a real challenge. But IronClad 2.0, a \$195 program from Silver Oak Systems, protects, maintains, and tracks file sharing on dedicated standalone and networked PCs without restricting access. IronClad

includes standard security features, such as multilevel password access, file locking and encryption, and limited virus protection. But IronClad also protects users' system configurations and prevents hard drive tampering while maintaining full access to programs and data. Designed to support both Windows and DOS, IronClad provides file auditing and an automated disk management routine that purges unwanted files at specified intervals. Silver Oak Systems, Inc., 301/585-8641, 301/588-6484 (fax).

Reader service no. 677

Halo Desktop Imager

Halo Desktop Imager has entered the ranks of bona fide image editors, according to its developers at Media Cybernetics. It boasts a host of retouching tools, an image gallery, and color separation capability. Lacking only the ability to do masking, the retouching tools include a special-effects brush that softens, sharpens, blends, or scrambles. You can clone or paint with any image. The erase brush has a partial undo feature that allows you to unpaint select

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offers advanced new features like zoom edit and drag and drop text, includes support for DDE and OLE, and is mail-enabled. We've souped up the spellchecker and built in Grammatik 5, the industry's best-selling grammar tool. We've included Adobe Type Manager and 12 new fonts. And we've come up with a few innovations you'll find nowhere else: QuickFinder, a versatile indexing and text retrieval system, and QuickMenu, a one-click shortcut











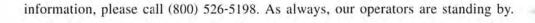
to customized Button Bars (several new Button

Bars and macros are shipping with the product).

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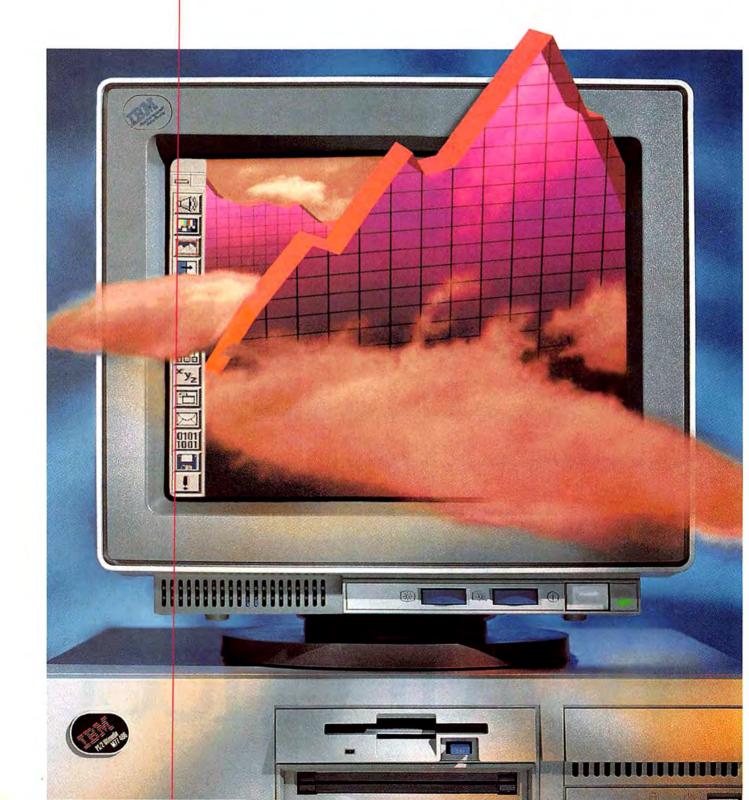
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WordPerfect

The power to mo Not to mention



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M57 486SLC2			Yes			
DV M57 486SLC2	486SLC2 50/25 MHz	212MB	8MB expandable to 16MB	Yes		
M77 486	486 SX 33 MHz	212MB	8MB expandable to 32MB	Yes		
M77 486DX2	AREDVO GE/32 MH- 212MB expanda		8MB expandable to 32MB	Yes		

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POINT-OF-SALE CAPABLE	YES	NO	YES
AVERAGE PRICE PER MODULE	\$22,22	\$49.95	\$695.00

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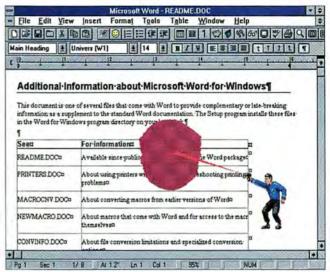
2609 Kootenai St. PO Box 6886 Boise, ID 83707

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Circle 56 on reader service card

Quick Takes



WHERE NO SCREEN SAVER HAS GONE BEFORE: Star Trek—The Screen Saver includes images and sounds from the original TV series.

layers of the image. The gallery provides thumbnail views of your images to simplify finding files. You can also copy, rename, delete, and open files from the gallery. A surprise in a \$169 program is the capability to do color separations. *Halo Desktop Imager 2.0* supports TWAIN, OLE, and Kodak Photo CD. Media Cybernetics, Inc., 800/992-4256, 301/495-5964 (fax).

Reader service no. 685

PCMCIA Notebook FAX/Modem Model CC2144

Designed for the PCMCIA card slots that are becoming common in the new generation of notebook and palmtop computers, Megahertz's 14,400-bps PCMCIA Notebook FAX/Modem Model CC2144 squeezes high-speed communications and fax capabilities into a fullfeatured, credit card-size package. Compliant with the V.42bis standard, the unit lets you use compression and error correction to send and receive data at up to 57,600 bps. Faxes can travel at up to 14,400 bps. The device includes its own power conservation mechanism and is cellular-telephone ready, provided you bring the optional cellular interface. Listed at \$699, the PCMCIA FAX/Modem includes a custom cable and is warranted for five years. Megahertz Corp., 800/527-8677, 801/272-6077 (fax).

Reader service no. 679

Star Trek-The Screen Saver

who brought flying toasters to the PC comes Star Trek—The Screen Saver, a \$59.95 Windows package featuring a host of images and sounds from the original television series. Part of Berkeley Systems popular After Dark series, ST-TSS includes scenes from Star Trek episodes, schematics of the Enterprise, and some timeless sound bits. Berkeley Systems, Inc., 800/877-5535, 510/540-5115 (fax).

Reader service no. 678

Amaze Daily Planners

windows Amaze Software's new *Daily Planner* helps you get through the workday with a good sense of humor. Version 2.0 comes with three theme packs: Trivial Pursuit Genius and Sports Edition, Far Side Volume II, and Cathy. The Cathy edition offers a new comic strip every day with laughs for those who, like Cathy, know the four basic guilt groups: food, love, mother, and career.

If that hits too close to home, try the Far Side version; new animation brings animals to life when you least expect it. The Trivial Pursuit edition asks a new question every day and keeps score all year long—so try to avoid answering questions in the geography category.

The calendars show your schedule by day, week, or month. New features include a tool bar for basic functions, a todo list, and an alarm that can be programmed to sound minutes or hours before an important event. The planners are available in DOS and Windows versions, and you can also run the new theme packs on Daily Planner 1.0. List price is \$69.95; individual theme packs are \$24.95. Amaze Inc., 800/395-1546, 206/820-7007.

Reader service no. 676

RangeLAN/PCMCIA

Portable computers should be portable, not tied down with wires and cables. Proxim's RangeLAN/PCMCIA gives any mobile PC with a PCMCIA slot a wireless local connection to the corporate LAN. Simply plug the device into the slot and attach a short, flexible antenna. For the network server, Proxim offers a receiver/ transmitter on an ISA add-in card with an external antenna.

The RangeLAN/PCMCIA employs spread-spectrum radio technology with error correction and can communicate with a file server at 242 Kbps. It can communicate with the server over "several hundred feet" within buildings and across 800 feet in the open. Drivers for Novell NetWare 2.x, 3.x, and NetWare Lite are included. The RangeLAN/PCMCIA sells for \$595. "Roaming" software that lets you communicate with multiple LAN servers is \$99. Proxim, Inc., 800/229-1630, 415/964-5181 (fax).

Reader service no. 680

NCR 3130 NotePad

NCR's second-generation pen PC, the 3130 NotePad, features a backlit screen with an improved 13-to-1 contrast ratio. Other new features include a PCMCIA card slot for an internal fax-modem, a LAN adapter, flash memory, and other cards. Choose between an internal 40MB or 60MB hard drive or a 20MB flash memory PCMCIA card. An additional bay can be used to house either an internal fax-modem or a second PCM-CIA slot.

At 4.7 pounds, the NotePad 3130 is slightly thicker and ½-pound heavier than the NotePad 3125 but retains the earlier model's 20-MHz 386SL processor. It comes with your choice of four operating environments installed: Windows for Pen Computing, Penpoint, PenRight, or PenDOS.

List priced at approximately \$3697 (depending on configuration), the NotePad 3130 is designed for mobile workers in professions such as health care, real estate, and field sales. NCR Corp., 800/225-5627, 513/445-5552 (fax).

Reader service no. 681

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



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PC WORLD

If multimedia fuels your imagination, here's some high octane.

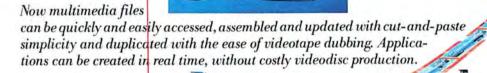
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Built around a programmable Intel "i750" chipset, ActionMedia II adapters will remain open to changing video standards.

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To find out more about how IBM ActionMedia II can lift your multimedia capabilities to new heights, or to order, call 1 800 426-9402, ext. 242.

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ULTIMEDIA.



Circle 125 on reader service card

Marketplace

Over the Counter

What you pay at retall stores for popular PCs

A Monthly Survey of Prices on Popular Models

National

딩

AST Power Premium 3/25s	1386SX-25	2	80	\$1845	\$158
Dell 333s/L	1386SX-33	4	120	\$1200	\$120
Gateway 2000 3SX-25	1386SX-25	4	80	\$945	\$945
IBM PS/2 Model 56 SLC	386SLC-20	4	80	\$1475	\$126
NEC PowerMate SX/25i	1386SX-25	2	60	\$1299	\$110
86DX-based desktop PCs					
AST Power Premium 3/33	1386DX-33	4	210	\$3095	\$265
Compaq Deskpro 3/33I	1386DX-33	4	120	\$1979	\$183
Compaq Deskpro 386/33M	1386DX-33	4	120	\$2569	\$232
Hyundal CS-386/40	Am386DX-40	4	120	\$1730	\$173
11/uniau 00 000/ 40	runocobii 40	- 0	120	41.00	4210
86SX-based desktop PCs					
AST Power Premium 4/25s	1486SX-25	4	210	\$2995	\$260
Compaq Deskpro 486s/25M	1486SX-25	4	120	\$2569	\$230
DEC DECpc 425sx LP	1486SX-25	4	245	\$1849	\$184
Dell System 486D/25	1486SX-25	4	200	\$1920	\$192
Dell System 425SE	1486SX-25	4	200	\$3570	\$357
Hyundal 433SP	1486SX-33	4	120	\$1459	\$145
IBM PS/ValuePoint 425SX	1486SX-25	8	170	\$1357	\$135
86DX-based desktop PCs	-				
AST Power Premium 486/33	1486DX-33	4	210	\$3495	\$302
Compaq Deskpro 486/33M	1486DX-33	4	340	\$3869	\$346
Compaq Deskpro 50M	i486DX2-50	8	340	\$4469	\$403
DEC DECpc 466d2 LP	1486DX2-66	4	120	\$2199	\$219
Dell 486D/66	1486DX2-66	8	230	\$2850	\$285
Gateway 2000 4DX2-66V	1486DX2-66	8	340	\$2425	\$242
IBM PS/2 Model 90 XP-OLF	1486DX2-50	8	400	\$5020	\$448
IBM PS/ValuePoint 433DX	1486DX-33	8	212	\$2199	\$219
NEC PowerMate 486/50i	1486DX2-50	4	240	\$2949	\$253
ortable PCs					
AST PowerExec 3/25SL	1386SL-25	4	80	\$2395	\$219
Compaq Contura 3/25	1386SL-25	4	120	\$2099	\$193
Compaq Portable 486c	1486DX-33	4	120	\$6199	\$563
Dell 320SLI	i386SL-20	2	80	\$2169	\$216
Dell NL25	i386SL-25	2	80	\$1649	\$164
Gateway 2000 HandBook	F8680	1	40	\$1295	\$129
Gateway 2000 Nomad 420SXL	1486SX-20	4	80	\$1995	\$199
Hyundai Courier Spectra	486SLC-25	4	120	\$2999	\$299
IBM PS/2 Model N51 SLC	386SLC-16	2	80	\$2265	\$191
IBM ThinkPad 700	486SLC-25	4	80	\$2750	\$255
NEC UltraLite SL/20	1386SL-20	2	80	\$1999	\$171
TI TravelMate 4000WinDX	1486DX-25	4	120	\$3299	\$293
Toshiba T3300SL	1386SL-25	2	80	\$2299	\$204
Zeos Pocket PC	V30-10	1	none	\$595	\$595
ZDS Z-Note 325Lc	1386SL-25	4	120	\$4625	\$4625

Configuration

RAM

(MB)

Hard

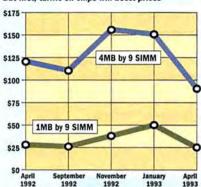
(MB)

CPU/speed

(MHz)

SIMM Prices Expected to Drop

But first, tariffs on chips will boost prices

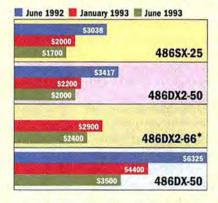


Average single-order street prices for nanosecond SIMMs should drop to record lows if a tariff on Korean-made chips is reduced in March as Ronald Bohn, senior industry analyst with Dataquest, expects. Though the cost of SIMMs fell steadily during much of 1992, U.S. tariffs imposed on Korean-made chips in late October increased retail prices. But prices may fall in late spring, says Bohn. Prices are in flux, he says, because the tariff is under review, with a final ruling from the U.S. Commerce Department expected by March 15.

Source: Dataquest

486 Price Cuts to Come

Dramatic drops in average street prices



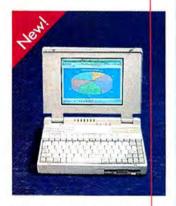
New CPUs from Cyrix, AMD, and Intel will bring price cuts of up to \$900 on 486-based systems this spring, says International Data Corporation pricing analyst Brian Clarke. Among the upcoming processors: Intel's Pentium chip should be available by April, Cyrix was expected to introduce a 486DX2type chip at press time, and AMD should deliver new 486 products soon thereafter. Price declines on 486DX-50s should be the most dramatic as vendors create a new price point for Pentium systems, expected to list from \$4000 to \$6000.

*Chip not available in June 1992 Source: International Data Corporation

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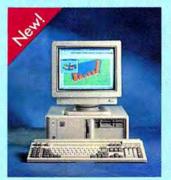
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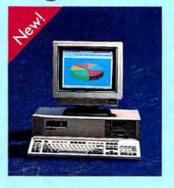
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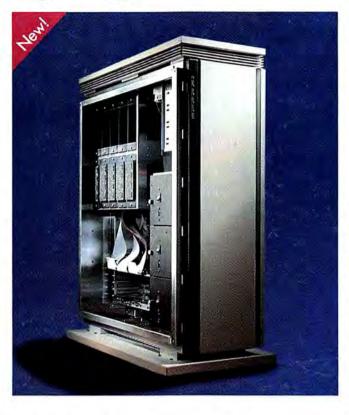
- 80486DX2/66 processor
- Upgradable to i486 processors and OverDrives
- Six 32-bit EISA bus master
- 128K write-back cache expands to 256K
- 4MB RAM; expands to 128MB
- 200MB hard drive
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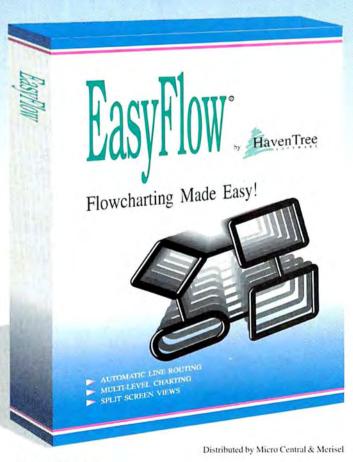


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25 New 486s: The Ottest

486-based computers are the desktop systems of choice for mainstream business use these days, and with good reason. They're powerful enough to handle the most demanding applications and affordable enough to be in step with today's belt-tightening budgets. So the question for most business buyers is not whether to buy a 486, but which 486 is right for their needs and means.

That question has never been harder to answer. While buyers may dream about owning the fastest PC possible, when it comes time to dig into their wallets, they just want the most PC for their money.

Is a \$1500 25-MHz 486SX a better value than a 50-MHz 486DX2 costing \$2800? If a DX2-66 is 70 percent faster than a DX-33, how much more should it cost? How do products from Cyrix and IBM compare to their Intel counterparts? And after figuring out which processor is best, how does a buyer go about finding the best machine?

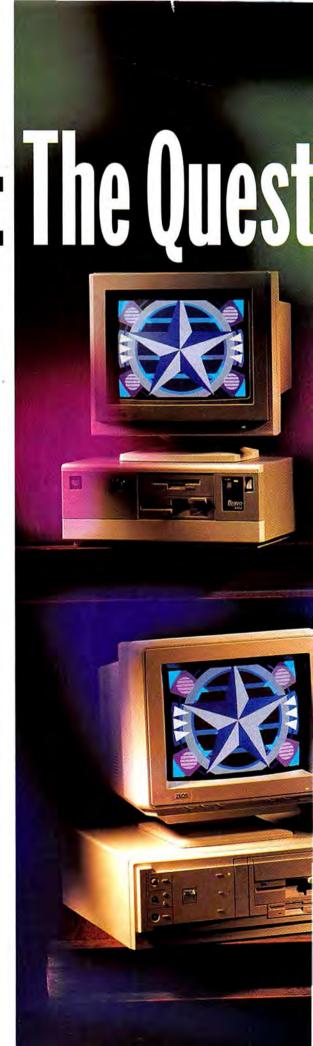
We don't claim to have the answers for every buyer. Yet we figured we could shed some light on the subject by taking a critical look at 25 systems using seven of the most popular desktop processors on the market today: the 25-MHz 486SX, 33-MHz 486DX, 50-MHz 486DX2, and 66-MHz 486DX2 from Intel; the 25-MHz 486SLC and 33-MHz 486DLC from Cyrix; and the 40-MHz 486SLC2 from IBM. We had two goals. First, we wanted to find out which processors offer the best price/performance ratios. Second, we wanted to do a "Best of" roundup to find out which of the top systems from recent reviews are the best all around.

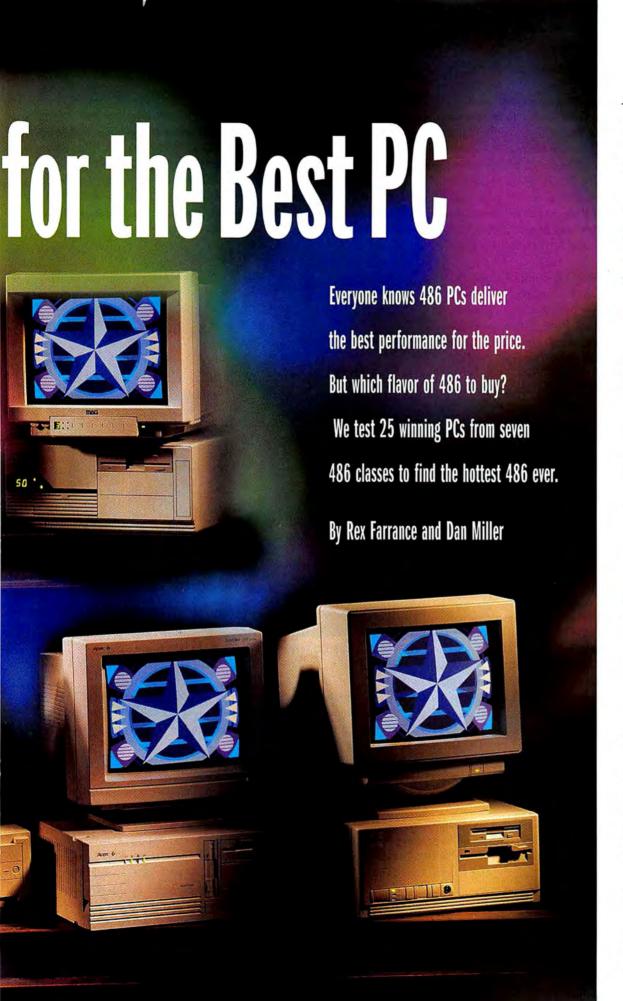
The Cream of the Crop

To pick the players for this All-Star game, we culled winners from previous *PC World* reviews. We selected Best Buys and near Best Buys from our June 1992 look at 33-MHz 486DXs, our October 1992 roundup of 50-MHz 486DX2s, and our November and December 1992 reviews of 25-

MHz 486SXs. For the 66-MHz 486DX2s (a DX2-66-only review will appear in our March issue), we went to vendors whose systems were not included in the 486SX-25, 486DX-33, or 486DX2-50 groups mentioned above. Then we gathered together as many systems as we could find that use Cyrix's 486SLC-25 and 486DLC-33 processors. Finally, we ordered systems based on the IBM 486SLC2-40 from the two vendors currently selling them: IBM (see

AST's Bravo 4/66D Model 123B, Acma's 486DX2/50, Zeos's 486DX-33, Acer's Acer-Power 486e DX2/50 Model 5557, and Tangent's Model 450ix: Our five Best Buys are fast, affordable, and have topnotch service and support.





The CPU Contestants



IBM 486SLC2-40



Cyrix 486SLC-25



Intel 486DX-33



Cyrix 486DLC-33



Intel 486DX2-66



Intel 486SX-25



Intel 486DX2-50

COVER STORY 486 SYSTEMS

"IBM: The Next Generation") and Reply. We would have loved to have included systems using the new Intel 486SX-33s and Cyrix's 486DLC-40 and 486S2-50, but none of those units were available in time for this review.

The first thing we looked at was price. As always, we base our price evaluations on what a system really costs, either at a local dealer or by mail order—not manufacturers' list prices. We priced each system with 8MB of RAM, two floppy drives (unless noted), a 100MB or larger hard disk, super VGA and a color monitor, DOS 5.0, Windows 3.1, a keyboard, and a mouse.

The CPU isn't the only system component that affects price. Some of these systems have bigger hard drives than others; some have better monitors. But within each group, these differences cancel each other out, so the overall prices we gathered should be representative of the "average" system in each processor class.

The two least expensive systems we found were the 486SLC-240 from Reply and the 486SLC-25 from CompuAdd Express. After that it was a free-for-all. SX-25s and Cyrix DLC-33s ran from just under \$1700 to just over \$2400, while most of the DX-33s cost about \$100 more. DX2-50s ran from about \$2100 to \$2500, and DX2-66s from around \$2400 to \$3200. With the exception of the DX2-66s, each step up in processing power costs an average of \$150 to \$300. Not that there aren't exceptions: One SX-25 cost just \$8 less than one of the DX2-66s.

See How They Run

After pricing these systems, we subjected each of them to the most comprehensive series of application tests the PG World Test Center has ever done, including our new Windows benchmarks and the new BAPCo test suite, which simulates typical

user sessions in ten popular business applications (for details, see the PC World Test Center Report).

When the results were n, we weren't too surprised by what we saw at the top of the performance charts. The DX2-66s were by and large faster than the DX2-50s, which in turn were faster than the DX-33s. The 66-MHz DX2s from AST, Compaq, Dell, and DEC were the four fastest machines in the review, followed by the DX2-50 from Acer.

In the bottom half of the speed rankings, however, speed distinctions became much less 486DLC-33, the IBM 486SLC2-40, and the Intel 486SX-25 overlapped considerably from 15th to 25th place on our charts. The CompuAdd Express, the only system to use the 25-MHz Cyrix 486SLC, placed next to last overall only because the PC Brand, which beat it soundly in Windows, bombed the BAPCo suite.

Why the differences in performance from CPU to CPU? With the Intel processors, the answer is obvious: They are essentially the same chip running at different clock speeds. The 486DX CPUs

Best Buys

In this review, versatility counts. None of the top five systems for price made it to our top five overall. However, the top five are, for the most part, affordable (strangely enough, a DX-33, the \$2844 Zeos, is the most expensive of the five). All five Best Buy systems—three DX2-50s, a DX2-66, and a DX-33—are fast, but only two of them ranked among the five fastest systems. All the Best Buys offer excellent customer service. Expandability and design are the final ingredients: adjustable clocks, sockets for future upgrade chips, and plenty of bays and slots will help these systems keep their value into the future.

- 1. Acer AcerPower 486e DX2/50 Model 5557 (page 120)
- 2. Acma 486DX2/50 (page 121)
- 3. Tangent Model 450ix (page 139)
- 4. Zeos 486DX-33 (page 140)
- 5. AST Bravo 4/66D Model 123B (page 122)



OUR OVERALL WINNER: Acer's AcerPower 486e DX2/50 Model 5557.

process at the speed of the system clock, whereas the DX2 models process at double speed. All provide a 32-bit data path and an 8K internal RAM cache. All except the 486SX also offer built-in functional math coprocessors.

The non-Intel processors are very different animals—they have a 486-style or augmented 386 core in 386SX and 386DX packages to enable system manufacturers to pump up their 386 designs. The Cyrix 486SLC and the IBM SLC2 use a narrow 16-bit data path; the Cyrix 486DLC uses a 32-bit data path. The SLC2 has a big 16K internal RAM cache, the DLC and the SLC have a tiny 1K cache. Both Cyrix chips process at system speed (33 MHz for the DLC and 25 MHz for the SLC), while the SLC2 is a clock doubler chip, which means the 20-MHz version we looked at processes data at 40 MHz. Finally, neither of the Cyrix chips nor the IBM SLC2 has a built-in floating-point (fractions) math coprocessor (Cyrix does, however, sell inexpensive coprocessors); all three use hardware to speed up integer processing.

In real life, the design differences between the SX-25, the Cyrix

DLC-33, and the IBM SLC2-40 average out so that all three are roughly comparable in performance. The Cyrix SLC-25 is the slowest of the bunch.

Each Intel chip, from the SX-25 to the DX2-66, is between 30 and 50 percent faster than the one before it. In our tests, those CPU speed gains translated to system performance gains of 15 to 30 percent. That's because things like the amount of RAM and secondary (external) memory cache and the speed of the hard drive and video controller all affect overall performance. We leveled the playing field as much as possible by ordering all the systems with 8MB of RAM. Some hard drive models were more common than others, but we discerned no correlation between a specific drive and overall performance. Every system was equipped with some kind of graphics accelerator. The only component that had a noticeable effect on performance, besides the CPU, was external RAM cache; within a given processor class, systems with more RAM cache tended to be faster than those with less.

Price/Performance Equals Value

Now that we had price and performance ratings in hand, we were able to compare the different processor groups to discover which one currently offers the most bang for your buck.

As shown in the price/performance scatter chart (see "How the Chips Fell"), we plotted the average overall performance rating for each processor class against its average price. We found that the DX2-50 offers the best price/performance in the review; however, the ratings for the SLC2-40, DX-33, and DX2-66 are virtually equal to the DX2-50's. Keep in mind that the SLC2-40 scores are based on just one machine.

Another way to look at the price/performance issue is to think about the premium you'd pay for jumping from a slower CPU to a faster one. The DX2-66s we reviewed offered an average 13 percent performance boost over the DX2-50s, but they cost an average of 27 percent more. On the other hand, the average DX2-50 offered a 13 percent speed boost while costing just 6 percent more than the average 33-MHz 486DX. Finally, the DX-33s were 37 percent and 30 percent faster than the SX-25s and Cyrix 486DLC-33s, but are only 9 percent and 13 percent more expensive on average. Using this approach, the DX2-50s and DX-33s turn out to be excellent deals.

We've found that 486SX-25 systems are a better value when upgraded with an OverDrive chip; upgraded SX-25s might very well rival the DXs and DX2s for overall value. Removing the poky PC Brand from the DLC group raises their average price/performance and makes them, as a class, a better buy. The DLCs would, in fact, be very good buys if they were priced as low as the Reply SLC2, around \$1600.

Service Aimed to Please

Our next goal, after finding out which CPUs offered the best value, was to find out which machines from this all-star group were the best buys. Along with price and speed, we factored in customer service, upgradability, and design.

To check service, we placed a series of anonymous calls to each vendor's tech support line, posed questions relating to typical customer problems, and rated the answers on the basis of responsiveness, courtesy, accuracy, and thoroughness. We also rated each com-

Best Price



The five least expensive systems in this review cost under \$1700. If you've been reading computer ads lately, that may not seem so low. But remember, we price these sys-

tems with real-world configurations: 8MB of RAM, two floppy drives (unless noted), a 100MB-plus hard drive, super-VGA video, a color monitor, a keyboard, a mouse, DOS 5.0, and Windows 3.1.

- 1. Reply Model 16 486SLC2 (page 138)
- 2. CompuAdd Express 425CX (page 127)
- 3. Copam 486SXB/25 (page 130)
- 4. PC Brand Leader 486/DLC (page 138)
- 5. Micro Express ME 486DLC (page 135)

Best Performance



No big surprise here: The DX2-66s are the fastest systems around. But what makes some 66s faster than others? And what puts one of the DX2-50 systems into the

top five? It's not the components that make a great system—it's how you put them together.

- 1. AST Bravo 4/66D Model 123B (page 122)
- 2. Compaq Deskpro 4/66i Model 120 (page 126)
- 3. Dell 486D/66 (page 130)
- 4. DEC DECpc 466d2 LP (page 130)
- 5. Acer AcerPower 486e DX2/50 Model 5557 (page 120)

Best Service and Support



Customer support has been improving throughout the PC industry over the last year or so, and it shows in this review. Most systems here offer on-site service, fast turn-

around on repairs, and long tech support hours. These five machines stand out from a generally good crowd by offering more of everything.

- 1. Austin 486/DLC-33 (page 126)
- 2. USA Flex 486/33 Cache (page 140)
- 3. Micro Express ME 486DLC (page 135)
- 4. DEC DECpc 466d2 LP (page 130)
- 5. Acma 486DX2/50 (page 121)

COVER STORY 486 SYSTEMS

pany on the length of the system's warranty, the cost (if any) of onsite service, and the turnaround policy for returning systems that need off-site repairs.

Generally, there's good news about service and support: Customer service is improving significantly throughout the PC industry. On a scale from 1 to 100, all but one of these systems scored over 80.

Upgrade Options With Tomorrow in Mind

One way or another, most of these systems can be upgraded to a faster CPU. Some of the m—including three that don't use Intel CPUs—have sockets ready for Intel's OverDrive chips. Others require you to remove the original CPU and install a new one;

these systems also require you to change the system clock speed by changing either jumpers or switches. Still others put the CPU on a replaceable board; if you want to upgrade, you have to order a new board from the vendor—unless it's a an SX-25 or a DX-33, in which case you can upgrade

with an OverDrive chip. Since the CPU-board option is the most expensive, we awarded fewer points for it in adding up the expandability scores.

While you might think the 66-MHz 486DX2s are nonupgradable—they're already the fastest systems you can buy—two of them (from Acer and Zeos) are equipped with 238-pin CPU sockets that are designed to accept the next generation of Intel upgrade processor, which is reportedly based on Intel's new Pentium technology. In any case, we didn't penalize the other 66-MHz machines for having no CPU upgrade path.

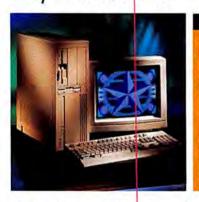
CPUs aren't the only thing you may want to upgrade. That's why you need enough expansion slots to accommodate future peripherals and enough bays to fit new drives. There was a huge variation in expandability: The 486SX-25 tower system from ALR, for example, has a whopping ten expansion slots; the compact Compaq, DEC, and Hewlett-Packard models have just three. The ALR has an amazing 12 drive bays, while the HP has only 2. Before you buy, make a realistic assessment of your needs.

One factor to keep an eye on is the number of externally accessi-

There's good news about service and support: Customer service is improving significantly throughout the PC industry. On a scale from 1 to 100, all but one of these systems scored over 80.

ble drive bays. With hard drives in the 100MB-plus range, tape drives for backup make more sense than ever, and installing one in a free, accessible drive bay makes the most sense of all (it's cheaper than an external one, and it takes up no additional desk space). The same is true of CD ROM players. The Acma, CompuAdd, CompuAdd Express, Dell, and Swan save room for externally accessible drives by using the new combo floppy drives, which put a

Acer AcerPower 486e DX2/50 Model 5557



VITAL STATISTICS

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408/432-6221 (fax) Reader service no. 687

•

Acer's 50-MHz 486DX2 entry in our multiprocessor sweepstakes is the decisive winner here, both in its

processor class and overall. This Best Buy came up with the combination of performance, price, expandability, and design it takes to deserve first place overall among 25 systems and seven processors. For starters, the Acer combines a reasonable \$2243 street price with overall performance that tops that of the other DX2-50s and rivals that of some of the 66-MHz 486DX2s. Fifth fastest overall, the Model 5557 scored fifth or higher on every benchmark except the Word for Windows test, and even there it outpaced two 66-MHz machines. The hot Power Vision local-bus graphics accelerator—using an ATI chip set—contributed to this fast showing.

Though this is already a hot system, if you need to, you can give

it an even faster future. Acer provides a variable system clock with 25-MHz, 33-MHz, and 50-MHz settings. That means you can swap in a 50-MHz 486DX or a 66-MHz OverDrive. And your upgrade possibilities don't stop there. The CPU socket is a 238-pin model designed to accept not only 486 CPUs but also the next-generation upgrade processor, which is reportedly based on Intel's new Pentium technology.

We can't fault the Acer's expandability: The unusual motherboard design combines a proprietary local-bus slot (filled by the video card), four free EISA slots, and two open 8/16-bit ISA slots. This compact desktop leaves plenty of room for drives, too—even with three of the six bays filled with two standard floppy drives and a 202MB Conner CP30204 hard disk. There are still two externally accessible bays free for adding extra storage devices, such as an internal tape drive or a CD ROM player.

In most respects, the Acer's design is excellent. The case (which can be easily converted for tower use) slips off and on with no screws required, and although it's a little inconvenient getting to the RAM under the hard disk and power supply cables, accessibility to the motherboard is good. In addition, the documentation is clear and concise, and the system has built-in security functions you can activate using the system's CMOS setup program. The only real fault we could find was the flimsiness of the internal casing, which, during our testing and evaluation of the system, made us uncomfortable with moving the PC around without its top cover in place.

The final piece of the puzzle is service and support, and here Acer has made dramatic strides. The company now provides a year of free on-site service and a toll-free technical support line with Saturday hours. We spent some time on hold during midday 54-inch and a 34-inch floppy drive in a single half-height bay.

In addition to expandability, we also rate design to evaluate a system's overall value. One of our first design considerations is internal accessibility: How easy is it to get to essential items on the motherboard, such as the external RAM cache and the CPU? We also consider the documentation, the quality of the keyboard, the size of the display, and other more subjective details, such as the quality of assembly and the sturdiness of the system case.

The Best Buys

When we finally totaled up all the ratings for each system, our findings agreed with our price/performance assessments of the various CPU classes. The 50-MHz 486DX2s made the strongest showing, occupying three of the top five positions for overall value.

The best overall rating goes to Acer's AcerPower 486e DX2/50 Model 5557. The Acer took first place with a compelling combination of speed, expandability, and design. Following the Acer are two more DX2-50s, the Acma 486DX2/50 and the Tangent Model 450ix. Like the Acer, these machines are among the best in overall price/performance. Each has great service and support, and while the Acma stands out on design factors, the Tangent rates high on expandability.

Rounding out the top five are the Zeos 486DX-33 and the AST Bravo 4/66D Model 123B. The Zeos was buoyed up by its impressive overall performance (it was the fastest 33-MHz 486DX) and high marks for expandability and design. The AST had the

best overall performance of any machine in the review and a lower price than any other DX2-66.

While our evaluation indicates that systems using the Intel 50-MHz 486DX2, 33-MHz 486DX, and 66-MHz DX2 represent the best overall values right now, that doesn't mean PCs with other CPUs aren't great values. Also, the fact that a 486SX-25 from vendor A didn't do well in this roundup doesn't mean another system from vendor A (particularly those using a DX2-50, DX-33, or DX2-66) wouldn't make a smart buy. The only result of this review that you can use to generalize about a given vendor is our service-and-support rating.

Things aren't standing still, either. While AMD suffered a recent setback in its quest to launch its own 486 chip (a court ruled that AMD's design hewed a little too closely to Intel's), the company still expects to deliver a 486-like CPU this year. Meanwhile, Intel will be coming out with the Pentium chip, which should knock 486 prices down a notch or two. Word has it that one or more of Intel's rivals are developing their own successors to the 486. For the time being, however, it's clear that each of these available 486 processors has its merits, and the competition between Intel, Cyrix, and IBM will only mean more and better CPUs and better prices. That said, it appears that—for now at least—Intel still rules the desktop.

Rex Farrance and Dan Miller are assistant editors for PC World. They can be reached on PC World Online (see page 8 for more information).

calls, and Acer has a long seven-day turnaround policy, but otherwise the company's new service-and-support package is A-OK. When we add up all the positives of this system, we can come to only one conclusion. Although we see great equipment every day, this PC is the kind of system we'd go out and purchase for ourselves—and that's why it's an easy pick as the best of this illustrious collection of systems.

Acma 486DX2/50



VITAL STATISTICS

Processor: Intel 486DX2-50
Direct price: \$2071
PROS: Excellent service and support, 15-inch monitor
CONS: Seven-day turnaround policy, poor accessibility to Weitek socket
Contact: 800/786-6888

Reader service no. 688

We looked at this same basic system in our October review of 50-MHz 486DX2s, and it won a Best

Buy. Well, surprise—it wins another here. That shows remarkable consistency and longevity in a volatile market. Often a product's development cycle—from initial production to replacement by a newer model—is complete in four to six months. This one still has what it takes to stand up to the competition.

The last Acma 486DX2/50 we looked at was maxed out for speed, with a full 256K RAM cache, a 4MB caching hard disk controller, and a 244MB hard disk. This model has a more economical configuration, with a 64K external memory cache (expandable to 256K) and a standard cacheless IDE interface to a 119MB Seagate ST3144A drive. The system's performance is a respectable middle-of-the-pack in its class, and its \$2071 price is the lowest of any of the 486DX2-50s here.

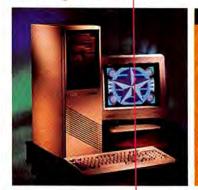
The Acma has an adjustable clock that you can jumper all the way up to 50 MHz. Your likeliest upgrade, however, will be to make a stop at 33 MHz and install a 33/66-MHz OverDrive CPU.

Acma gives you a sturdy compact desktop case, which gives you reasonable, if not outstanding, expandability. Four 8/16-bit slots are free. Another unfilled 8-bit slot would be usable if Acma had mounted the I/O ports on the system case instead of on the 8-bit slot's cover. Accessibility to the CPU socket and the memory is good, but high-end CAD users will have difficulty installing a Weitek coprocessor, because the socket is tucked away beneath the drive cage. Fortunately, all four drive bays are externally accessible, and Acma provides a combo floppy unit that takes up just one bay, so you'll have plenty of room for more storage. The 15-inch Mag monitor is a terrific addition.

Acma's service-and-support package is a real strong point. You get a year of free on-site service and toll-free technical support—even on weekends. Although Acma's tech support department is small, every one of our calls was answered promptly with an impeccably accurate response. Wrapping up this kind of service package with a terrific price makes this 50-MHz 486DX2 a tremendous value and a Best Buy.

COVER STORY 486 SYSTEMS

ALR Flyer 32 LCT



VITAL STATISTICS

Processor: Intel 486SX-25 Street price: \$2009 PROS: Outstanding device capacity, CPU card upgradable CONS: Access to RAM sockets slightly impeded by drive cage Contact: 800/444-4257 Reader service no. 689

ALR's Flyer 32 LCT is a tall, good-looking tower model with the kind of expandability we really like in a server or high-end workstation. In fact, this PC gives you a mind-boggling ten free slots and a total of 12 drive bays. Even if you manage to fill up all those bays, the 300-watt power supply should keep it from blowing a fuse.

Moreover, the Flyer is no slouch when it comes to performance. Its 25-MHz 486SX processor is only the fourth most powerful here, but it's notable that the ALR outpaced all the other 25-MHz machines in this review as well as all of the 33-MHz 486DLCs. The system comes with the external memory cache filled out to 256K and uses an integrated video accelerator featuring the WDC 90C30-ZS chip.

Our system came with a 112MB Western Digital Caviar 2120 drive complemented by two standard floppy units. Accessibility is good-our only quibble is with the memory position of the slots for the memory SIMMs, which are hard to get at under the 3½-inch drive cage. But every single slot will accept a full-length card, and

the design and layout are terrific otherwise. ALR even takes care of the smaller touches: For example, the CPU card and external RAM cache are both supported at the top with a bolt fastened to the frame, making for an extra-stable installation.

You'll be able to match your horsepower to the future demands of your applications, too. As it stands, you can purchase either a 33-MHz 486DX or a 66-MHz 486DX2 processor card for the system. The most obvious upgrade is to install a 25/50-MHz OverDrive processor in your existing card. But if you like, you can go for a two-step approach, installing a 33-MHz 486DX card and then later swapping in a 33/66-MHz OverDrive.

ALR's service-and-support package is outstanding. On-site service is available for a nominal \$10-a-year processing fee, there's a three-day turnaround policy on off-site repairs, and you get toll-free technical support for the life of your system. In addition, you get access to ALR's 24-hour BBS and technical fax-back lines. When we called the company's tech-support people, our questions were all answered promptly and accurately.

This is a PC with a lot going for it. The 25-MHz 486SX CPU doesn't give the kind of performance or value found in the 486DXs and 486DX2s. Still, if you need a server or workstation with bigtime peripherals capacity-and you want to get an economical start with one of the fastest 486SX-25s around—this PC should solve your problem.

AST Bravo 4/66D Model 123B



VITAL STATISTICS Processor: Intel 486DX2-66 Street price: \$2413 PROS: Fastest system overall, ZIF socket CONS: Only two externally accessible drive bays Contact: 800/876-4278. 714/727-4141

Reader service no. 690



The hot-blooded AST Bravo 4/66D is your top choice if you want a Best Buy system that's also a top-level performer. We're not kidding about the speed, folks: With

its 66-MHz 486DX2 processor, full 256K external memory cache, and integrated video accelerator, the AST came in first overall as well as on the Freelance, Paradox, and BAPCo suite of applications tests. The Bravo 4/66D also placed second and third on the Excel and Word for Windows tests, respectively. The bottom line: This is the fastest system we have ever tested.

Speed alone isn't enough, however, to earn the system its overall Best Buy recommendation. Price plays a major role in making the AST a great value. At a reasonable \$2413 on the street, it beats the Hewlett-Packard Vectra 486/66N PC Model 170-the next cheapest 486DX2-66 in this review-by more than \$200. It's cheaper than one of the DX2-50s and one of the DX-33s. As a result, this is the only 66-MHz 486DX2 model reviewed to make it into the top five for overall value.

The hot-blooded AST Bravo 4/66D is your top choice if you want a Best Buy system that's also a top-level performer. The bottom line: This is the fastest system we have ever tested.

Inside the AST's compact desktop case, you'll find a tiny motherboard with a zero insertion force (ZIF) socket for effortless CPU swapping. The ZIF socket is a nifty feature, but with the system already maxed out with the 66-MHz 486DX2 installed, you'll probably never have to use it. You get a respectable four free 8/16-bit expansion slots, four drive bays, and a 116MB Quantum ProDrive LPS hard disk. However, both of the externally accessible bays are taken up by the standard floppy drives, so you won't be able to add a tape or CD ROM drive to the machine-an unfortunate limitation in an otherwise beautifully designed machine.

AST's customer service-and-support package is very good. It includes a year of free on-site service, an outstanding two-day turnaround policy on factory repairs, and toll-free technical support (even on weekends). Getting through to the AST technicians proved very easy, and they answered all our questions quickly, courteously, and accurately. This kind of excellent service, reasonable price, and blazingly fast performance makes this machine easy to recommend. If you're the kind of person who has to have the fastest, this PC is your natural Best Buy.

ATronics Int'l ATI-486SX/25



VITAL STATISTICS

Processor: Intel 486SX-25
Direct price: \$1795
PROS: Good device capacity, good price
CONS: \$99 charge for on site service
Contact: 510/656-8400, 510/656-8560 (fax)
Reader service no. 691

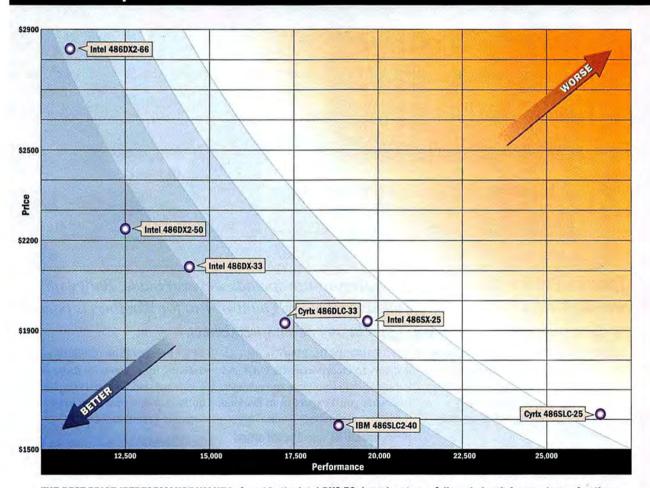
The ATronics Int'l ATI-486SX/25 is another tower model with lots of room for drives and other peripherals. The big, good-looking case houses a small, intelligently designed system board with eight slots (half a dozen are free). There are no obstructions in this highly ac-

cessible setup, and every slot will accept a full-length card. You get a total of nine drive bays (six are externally accessible), so you have plenty of room for additional drives.

We ordered this unit with a 25-MHz 486SX processor, which is by no means a powerhouse compared to much faster 33-MHz, 50-MHz, and 66-MHz competitors. But the ATI-486SX/25 is a respectable performer—in its class—and this machine is eminently upgradable. It will accept any of the 486 processors, including a 66-MHz 486DX2 (if you adjust the system clock to 33 MHz). Or you can run the clock at 50 MHz and install a 50-MHz 486DX. Since you already have 256K of external memory cache and a Diamond Stealth VRAM graphics accelerator installed, the cost of your upgrade will be limited to the price of a new CPU chip.

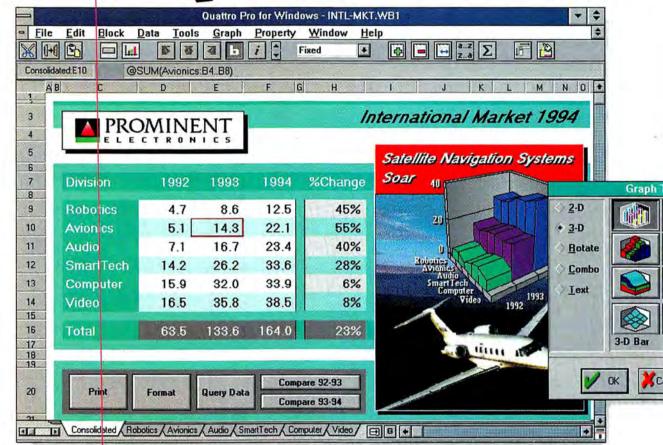
Speaking of cost, the ATronics's \$1795 price is very attractive, and this system missed our top five price list by less than \$100. As for customer service and support, ATronics did a superior job of responding to the questions we posed over the company's toll-free line. In addition, ATronics has a three-day turnaround policy for any

How the Chips Fell



THE BEST PRICE/PERFORMANCE VALUE is found in the Intel DX2-50-based systems, followed closely by a system using the IBM 486SLC2-40. Close behind them are PCs based on the Intel 486DX-33 and the Intel 486DX2-66. The numbers given are averages for all the systems of a given processor type in this review; they provide a general indication of the price and performance levels for systems based on that particular processor. Price/performance numbers for individual systems vary widely.

Excel and 1-2-Quattro Pro



Quattro Pro for Windows *is the easiest-to-use spreadsheet ever made. Built with Borland's renowned object-oriented technology, Quattro® Pro for Windows is packed with hot new features you won't find in any other spreadsheet.*

NEW! Spreadsheet Notebooks with customizable Tabs are nothing less than a revolution in spreadsheet ease of use. Now you can intuitively organize and manage your spreadsheet data.

NEW! Object Inspector™ menus

end the hassle of searching through menus. They're simpler than 1-2-3. Just click the right mouse button anywhere on the screen to get a list of what you can the things and change it right there.

NEW! Database Desktop™ is the easiest way to incorporate dBASE® and Paradox® data into your spreadsheet. Just what you'd expect from Borland, the leader in database technology.

NEW! SpeedFill and **SpeedFormat** slash setup time by automatically filling in spreadsheet headings and formats.

NEW! SpeedBars[™] are customizable and context-sensitive. SpeedBar icons give pushbutton access to your most frequently used commands.

NEW! Presentation Graphics and drawing tools that rival those of Freelance and Harvard Graphics are built-in. You don't need to buy a separate graphics package.

YES! Compatible with Lotus 1-2-3 files, macros, and publishing styles; Excel .XLS files; and eight graphic formats. Quattro Pro for Windows offers the best spreadsheet, database, and graphics file compatibility available.

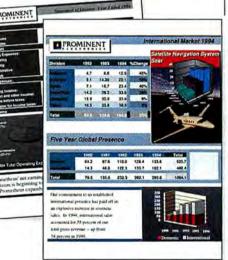
-3 users prefer for Windows

An independent test proves...

It's a fact: two out of three Excel and 1-2-3 spreadsheet users tested prefer Quattro Pro for Windows to their current spreadsheet. They say it makes you more productive and is easier to learn and use. That's the result of a study conducted by

Usability Sciences Corporation, a highly regarded independent testing lab used by major software publishers, including Lotus.

- The Object Inspector makes it easy to view and select your options.
- ▼ WYSIWYG printing makes it easy to create high-impact reports.



...the easiest-to-use spreadsheet...

OBJECT INSPECTOR



Quattro Pro for Windows is the most advanced, yet easiest-to-use spreadsheet ever created for the personal computer. Thanks to the use

of new object-oriented technology, Borland has radically simplified the use of the world's most feature-rich spreadsheet. With Quattro Pro for Windows you get your work done faster because you work visually. Simple point-and-click operations are all that's needed to complete any spreadsheet task—from building your spreadsheet to creating dazzling graphical reports.

...makes you more productive

Never before has so much spreadsheet power also meant this much user productivity. Spreadsheet Notebooks and Object Inspector menus are breakthrough concepts that make it easy to tap the awesome functionality of Quattro Pro.

Only Quattro Pro for Windows gives you transparent access to database information. Borland's unique Database Desktop™ lets you view, edit, and copy dBASE

and Paradox tables directly from within Quattro Pro. Plus, we've included all the tools you'll ever need for creating your own custom spreadsheet applications.



Quattro Pro for Windows November 10, 1992

"Quattro Pro for Windows is a better spreadsheet than Excel 4.0."

-Computer Shopper, November 1992

1-2-3 and Excel users tested prefer Quattro Pro for Windows two to one. But why not see the world's best Windows spreadsheet for yourself? Get Borland's new Quattro Pro for Windows today.

See your dealer today or call 1-800-336-6464, ext. 5071

In Canada, call 1-800-461-3327.





BORLAND

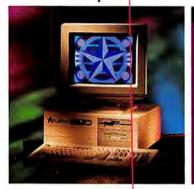
Software Craftsmanship

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COVER STORY 486 SYSTEMS

necessary factory repairs. The only faults we can find with the service package are that you have to pay \$99 for a year of on-site service and that there's no weekend support. If you're looking for a well-designed, low-priced PC that is ready to grow with you, the ATronics is a fine value.

Austin 486/DLC-33



VITAL STATISTICS

Processor: Cyrix 486DLC-33
Direct price: \$1846
PROS: Terrific support
CONS: Not user upgradable,
memory cache access blocked
by drive cage
Contact: 800/752-1577,
512/454-1357 (fax)
Reader service no. 692

In this crowd, it's quite an accomplishment to rate number one in service and support, but that's just what the Austin 486/DLC-33 does. Here's what you get: a year of free on-site service complemented by a two-day turnaround policy and an outstanding 24-hours-a-day, 365-days-a-year toll-free technical support connection. On top of that, in our anonymous telephone checks, Austin's technicians proved to be perfect diagnosticians.

Unfortunately, reliable technical support and generous customer service policies alone are not sufficient to merit the system a Best Buy. This PC, which offers 25-MHz 486SX-class performance, has one glaring problem: It is not user upgradable. What you see is what you get—forever. Austin tapes a seal across the 33-MHz Cyrix 486DLC processor, informing you that your warranty is void if you remove it.

Still, with the DLC-33 chip in place, this system showed respectable speed for its class, turning in a performance within 3 percent of the overall fastest of the 486DLCs and better than four of the five 486SX-25s. It did particularly well on the *Word* and *Excel* portions of our *Windows* tests.

The system comes with a speed-enhancing 128K external memory cache—but upgrading it to its 256K maximum capacity is difficult because of its position under the 3½-inch internal drive cage. Otherwise, accessibility to the baby motherboard is fine. And the \$1846 price is attractive as well.

Like many of the other companies in this roundup, Austin installed its I/O ports on one of the slot covers, which puts that slot out of commission unless you feel like reinstalling the ports in the screw-equipped case cutouts. Total device expandability is quite good, however, with six free slots (if you count the obstructed one) and five total bays. Three bays accept externally accessible drives, so even with the two floppy drives installed, you wind up with one of the bays free.

The great service-and-support package and reasonable price make this system tempting for applications not requiring a top-speed system. However, the inability to upgrade the system's entry-level CPU makes it less attractive than some of the other, more upgradable low-end systems in this review.

Blackship BLK 486/33 ISA



VITAL STATISTICS

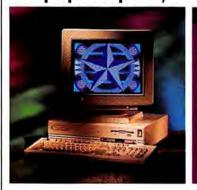
Processor: Intel 486DX-33
Direct price: \$1795
PROS: Good balance of price and performance
CONS: Access to CPU blocked by drive cage.
Contact: 800/531-7447,
408/432-1443 (fax).
Reader service no. 693

The Blackship BLK 486/33 ISA system is a nice-looking minitower model with a 33-MHz 486DX processor. It comes with all the basics, including a 64K external memory cache you can expand to 256K, an Orchid Fahrenheit 1280 video accelerator, and a 124MB Maxtor 7120A hard disk. This PC has good overall speed, and you can buy it for a thrift-conscious \$1795. As a result, it provides a very attractive balance of price and performance. And you have plenty of growing room in its five drive bays and seven free slots. Two of the 8/16-bit slots will accept just a half card; they're obstructed by the drive cage. But with all these slots, who's counting? What's more, with the two standard floppy drives installed, you still have two free externally accessible drive positions.

Blackship uses good components, and the American Megatrends Incorporated (AMI) Super Voyager motherboard is no exception. Fortunately, the Super Voyager provides an upgrade socket, which you can use if you want to add a 33/66-MHz OverDrive processor. You'll have to totally remove the 3½-inch drive cage if you want to retrieve the 33-MHz 486DX chip, however.

Blackship's technical support is very good, providing a year of free on-site service, toll-free technical support (weekdays only), and a two-day turnaround policy. Although Blackship just missed the brass ring, this system's price/performance dividend makes it a solid investment.

Compaq Deskpro 4/66i Model 120



VITAL STATISTICS

Processor: Intel 486DX2-66
Street price: \$3037
PROS: Fast, includes Business
Audio, excellent documentation
CONS: Limited device capacity,
no turnaround policy
Contact: 800/345-1518,
713/370-0670
Reader service no. 694

Business users all over the country rubbed their hands together in glee when Compaq announced its dramatic price cuts last summer. All of a sudden you could buy a Compaq at clone prices. The \$3037 street price on the Deskpro 4/66i Model 120 is still the second steepest here—but you get a 66-MHz

486DX2 for your money. And the performance of this handsome little low-rise system is second only to that of the AST Bravo 4/66D. Even with its external memory cache maxed out at a relatively low 64K, it blew away all comers on our *Excel* test, topped the field on *Word for Windows*, virtually tied for first on *Paradox*, and scored second on *Freelance*.

With this system you also get Compaq's integrated QVision accelerator and the company's new Business Audio feature, which lets you annotate *Windows 3.1* documents with voice notes to voice-illustrate presentations and training programs, or even ask the boss—nicely—for a raise at the end of a particularly good quarterly report. Compaq complements this package with a microphone and headphones, for which there are jacks in the back of the case.

Unfortunately, that case is not easy-open—unusual for Compaq—and it doesn't give you much room to expand. You get only three free 8/16-bit ISA slots, and the drive bays are already filled with the 116MB Quantum hard drive and the two standard floppy units. Too bad Compaq didn't install one of the nifty new combo floppy drives that fit both standard floppy drives into a single bay. Clearly, this box was designed to be used as a fast LAN workstation or for an application where expandability isn't essential. Your access to the RAM is impeded by the hard drive cage, so we suggest you get all the RAM you think you might need installed by the dealer before you pick up your system.

The service package includes a year of free on-site service and toll-free technical support (available weekends). To make it less likely that you'll need to call, the documentation is a joy, right down to the motherboard layout map and switch guide pasted to the top of the floppy drive cage. Unfortunately, there's no service turnaround policy for off-site repairs. The general quality, fit, and finish of this PC is excellent, however. So if you can afford to pay the price and you don't need expandability, this PC could be a good purchase. After all, it is a Compaq.

CompuAdd 433DLC



VITAL STATISTICS

Processor: Cyrix 486DLC-33 Direct price: \$2260 PROS: Multiple upgrade paths; very good documentation CONS: Relatively pricey Contact: 800/456-3116, 512/250-1489 Reader service no. 695

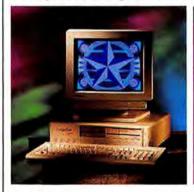
CompuAdd sells its PCs both through the mail and at its 114 retail outlets in 38 states. This unit, the 433DLC, is a low-rise 33-MHz Cyrix 486DLC system with a universal CPU socket that will also accept any Intel 486 chip, including the hot 33/66-MHz OverDrive CPU. The 433DLC performed well in its class; it was the fastest 486DLC system overall, although not quite as fast as the ALR Flyer 32 LCT 25-MHz 486SX. The performance of the 33-MHz 486DLCs seemed to max out in the same range as Intel's 25-MHz 486SX, probably because of the 486DLC's tiny cache: The SX has

an 8K internal cache; the DLC's is 1K. So even though the SX runs at a lower clock speed, its performance is roughly comparable to the DLC-33's. The CompuAdd features an external memory cache filled out to 128K, an integrated Tseng ET 4000AX video accelerator, and a math coprocessor.

CompuAdd put a reasonable amount of peripherals capacity into this low-profile box, providing three 8/16-bit slots and two 8-bit slots. The two 8-bit slots can accommodate only half cards because of their proximity to the drive cage. There are only three drive bays total, but CompuAdd wisely extended capacity by including a two-in-one combo floppy drive. So even with the 119MB Seagate ST3144A hard drive installed, you still have a spot left to add a tape drive or other storage device.

The documentation is wonderful, and CompuAdd's service-andsupport package is top-notch. Along with a year of free on-site service and a three-day service turnaround policy, you get 24-hours-aday, 365-days-a-year toll-free technical support. This system's Achilles' heel is its \$2260 price—pretty steep for a PC with such modest performance. The CompuAdd has quite a bit going for it, but if you're set on buying a 486DLC PC, the Micro Express system offers a better value.

CompuAdd Express 425CX



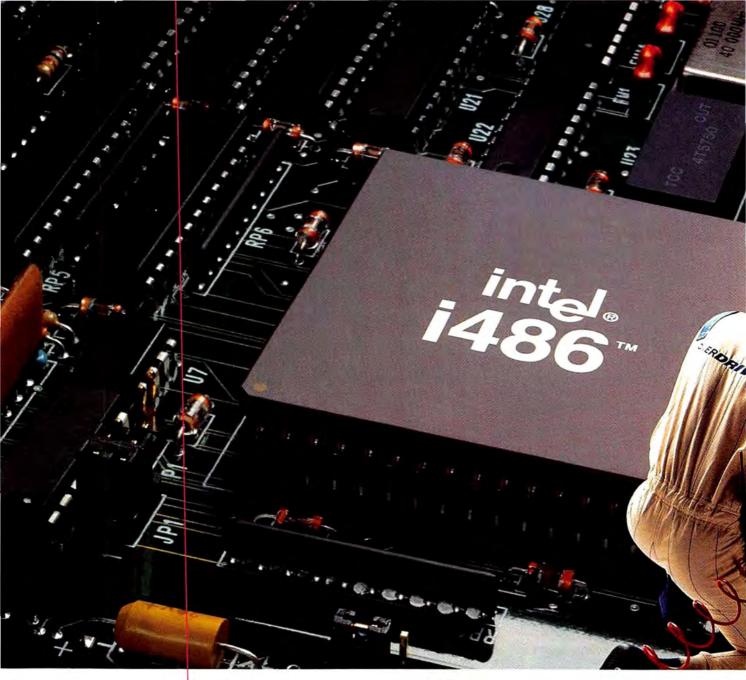
VITAL STATISTICS

Processor: Cyrix 486SLC-25
Direct price: \$1618
PROS: Second lowest price
CONS: Poor price/performance,
no upgrade path, no external
RAM cache
Contact: 800/925-3000,
512/219-1800
Reader service no. 696

CompuAdd Express, a CompuAdd offshoot, is a separate business entity that sells solely by direct mail—with a particular focus on price-sensitive buyers. Because of the corporate ties, we weren't surprised to find strong similarities between the CE 425CX and the aforementioned CompuAdd 433DLC. The case design is identical, and you get the same five free slots, three bays, and combo floppy drive.

The 425CX uses a different motherboard from the CompuAdd 433DLC, with a postage stamp-size Cyrix 486SLC processor hard wired in—no upgrades allowed. The system won't accommodate an external RAM cache (the SLC chip has a 1K internal cache) but does provide an integrated Western Digital WD90C31 graphics accelerator and an 80387 coprocessor socket.

The 425CX really shines on price: Of the 25 machines in our roundup, this \$1618 PC is the second least expensive; only the Reply Model 16 486SLC2 costs less. And the service and support also rates well, although you get 10 hours of daily support instead of CompuAdd's 24, and you can't call on weekends. Unfortunately, since the 425CX's performance is so poor, and since the system already paints you into a corner when it comes to upgradability, we can't recommend it.



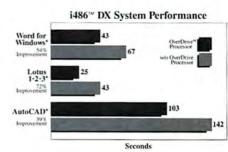
To run all your appli you make a

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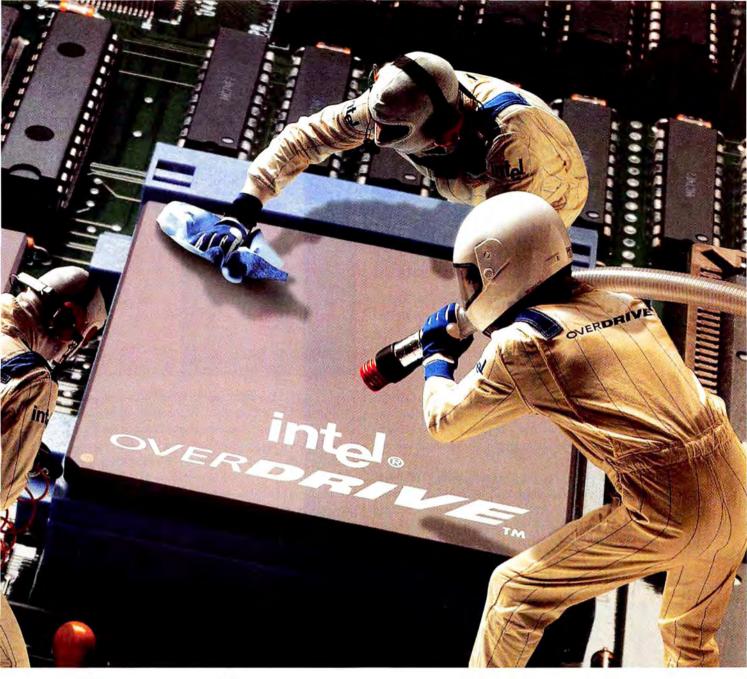
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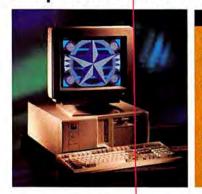
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CompuTrend Premio 486SX/25



VITAL STATISTICS

Processor: Intel 486SX-25 Street price: \$1759 PROS: Good price CONS: Poor performance, poorly installed motherboard Contact: 800/677-6477, Reader service no. 697

The CompuTrend Premio 486SX/25 features a miserly \$1759 price and a good-looking compact desktop case. But speed is another story. Although it has a 64K external memory cache (upgradable to 256K) and a Western Digital Paradise graphics accelerator card, this was by far the slowest of the five 486SX-25s we tested and the third slowest system of any kind overall in the roundup.

The Premio has five externally accessible drive bays, and the system comes with six unoccupied slots in our configuration. Unfortunately, the end of the motherboard with the CPU socket is completely unsupported; unless you're careful, you could damage the motherboard during a CPU swap.

CompuTrend's service is adequate if not outstanding. The system comes with three months of on-site service, which you can extend to one year for \$75. If you're on a 486SX-25 budget, you might be lured by the Premio 486SX/25's low price. Considering its benchmark scores, however, you can get a much faster start elsewhere.

Copam 486SXB/25



VITAL STATISTICS

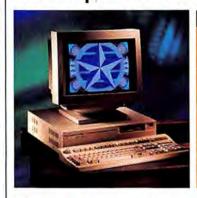
Processor: Intel 486SX-25 Street price: \$1681 PROS: Excellent price, CPU-card upgrade to 50-MHz 486DX CONS: Mediocre performance Contact: 800/828-4200, 510/623-8551 (fax) Reader service no. 698

Copam's 25-MHz 486SX packs one of the best price tags in the review. At \$1681 on the street, it's priced within about \$100 of the cheapest machine here. This 486SX system uses a CPU-card design, with 33-MHz and 50-MHz 486DX processor cards also available. And like any 486SX-25, the system also accepts a 25/50-MHz OverDrive CPU. Low price notwithstanding, Copam was able to supply a generous 201MB Seagate ST1239A hard disk. Also, users concerned about display emissions will find Copam's low-radiation monitor attractive.

Performance is nothing to write home about; overall the system ranked fourth from the bottom. The service-and-support package includes a three-day service turnaround policy and toll-free support

(but not on weekends). On-site service for the first year costs a hefty 8 percent of the system price. Still, the fine price, good upgradability, and general quality of assembly all combine to make this system a decent value-and an even better one if you install a 25/50-MHz OverDrive upgrade to crank up performance.

DEC DECpc 466d2 LP



VITAL STATISTICS

Processor: Intel 486DX2-66 Direct price: \$2969 PROS: Fast, excellent service CONS: Pricey, only three expan Contact: 800/722-9332, 800/524-5694 Reader service no. 699





You expect 66-MHz 486DX2s to be fast, and the DECpc 466d2 LP's performance sparkles-the system placed fourth overall and finished third on the Paradox test

and the BAPCo test suite. You get a filled-out 256K external memory cache and an integrated S3-based video accelerator.

The 466d2 LP is a good-looking little workstation, but don't expect much expandability-you get only three 8/16-bit ISA slots that hold cards horizontally. Only two of the four drive bays are externally accessible. DEC provides a 116MB DEC LR74992 hard disk with this system.

When it comes to service, DEC is among the five best vendors in our review. A two-day service turnaround policy, a year of free onsite service, and toll-free technical support are all standard. And our technical questions were answered to perfection. DEC lacks only a weekend line. So what's not to like about this system? The \$2969 price, for one thing-it's the third highest here. High cost and limited expandability pulled the DECpc 466d2 LP's overall value rating into the bottom third of the review, despite the great performance and outstanding service.

Dell 486D/66



VITAL STATISTICS

Processor: Intel 486DX2-66 Direct price: \$3218 PROS: Third fastest system, excellent design CONS: Highest price in review Contact: 800/289-3355, 800/727-8320 (fax) Reader service no. 700

The 66-MHz 486DX2 Dell system was the third fastest machine overall in the review-despite its lack of an external memory cache. It placed second on the more DOS-intensive BAPCo test suite (doing particularly well on the graphics segment) and fourth on our Windows tests overall.

The Dell also scores points for good design. Inside the easy-open case, you'll find an uncluttered, highly integrated motherboard. Each of the six 8/16-bit slots accepts a full-length card, and the cables connecting the 116MB Quantum hard drive to the rest of the system are neatly tucked away from the motherboard. The two floppy drives are incorporated into a single combo drive, which leaves the other two externally accessible 5½-inch bays free; the 224-watt power supply ensures you'll have plenty of juice to run those extra peripherals.

Dell's service and support has traditionally been a strong selling point. And why not, with a year's free on-site service, toll-free technical support available 18 hours a day and on weekends, and an outstanding one-day service turnaround policy?

Dell has maintained a great reputation for service, design, and quality, but the company is no longer a price leader. This machine's \$3218 price may not seem terribly high, considering that this is a 66-MHz 486DX2. But it's the most expensive machine in the review, and you can buy the 66-MHz AST (which was the fastest overall performer) for \$800 less. That's the kind of difference that separates the Best Buys from the good ones.

IBM: The Next Generation

Once the innovator and establisher of the PC standard, IBM fell off the price/performance curve years ago. In an attempt to address its problems and reestablish its position, IBM has reorganized its personal computer division into the new IBM Personal Computer Company. However, the changes have only just begun, and IBM's offering for our latest review fell short of the mark.

The 386SLC: You're No 486

The story began with our January systems review. We invited IBM to participate and send in the best Windows system it had for under \$2500. We eventually received an IBM PS/2 Model 56, which is based on the company's 386SLC processor (basically a 386SX clone with a 16K internal cache). It came with 4MB of RAM and an 80MB hard drive. This clearly wasn't going to match up to the other systems in the roundup, which typically included faster 486 processors, 8MB of RAM, and 200MB hard drives-all for around the same price. IBM had just announced a new clock doubler CPU, the IBM 486SLC2. IBM first sent us an upgrade board and then a full SLC2 system.

Although this SLC2 system completed our new Windows test suite, it performed poorly compared with the other systems, partly due to the small amount of RAM. We asked the companies involved in the review to explain why they chose the machines they sent. IBM passed this request on to its public relations firm, which actually selected the machine and sent us the explanatory letter. The public relations firm says it consulted with IBM in making this selection and explaining it.

We felt that IBM wasn't doing itself justice and at the least could have included more memory in its system, so we wrote to Robert Corrigan, president of the new IBM Personal Computing Company, to get a better explanation of the systems IBM has to offer. He too chose to pass the letter on to IBM's public relations firm. We decided to give IBM another chance, drop its system from that review, and try to look at one of its newly announced PS/2 Model 56 systems with XGA2, IBM's next generation of the XGA video standard.

Unfortunately, we encountered a different set of problems with the IBM system this time around: We were unable to get the XGA2 video to work with our Windows test

better times than the Reply because of tight video integration. As always, IBM's construction is excellent. Expandability isn't as good, but the system does include a SCSI adapter and drive, making it easy to add SCSI hard drives, CD ROM players, and scanners.

Where IBM really shines is in service and support. The company not only offers central support in addition to its legendary on-site service, the service is free for a phenomenal three years. At press time IBM announced dramatic price reductions, making this system very competitive. Our estimate is that the IBM system would have had a street

Unfortunately, we encountered a different set of problems with the IBM system this time around: We were unable to get the XGA2 video to work with our Windows test suite.

suite because of an XGA2 incompatibility with the Microsoft Test for Windows application that controls the tests. We also noted incompatibilities with Microsoft Word for Windows. Once again, we were forced to leave IBM out of the main review, but this time we decided to talk about how IBM's systems measured up.

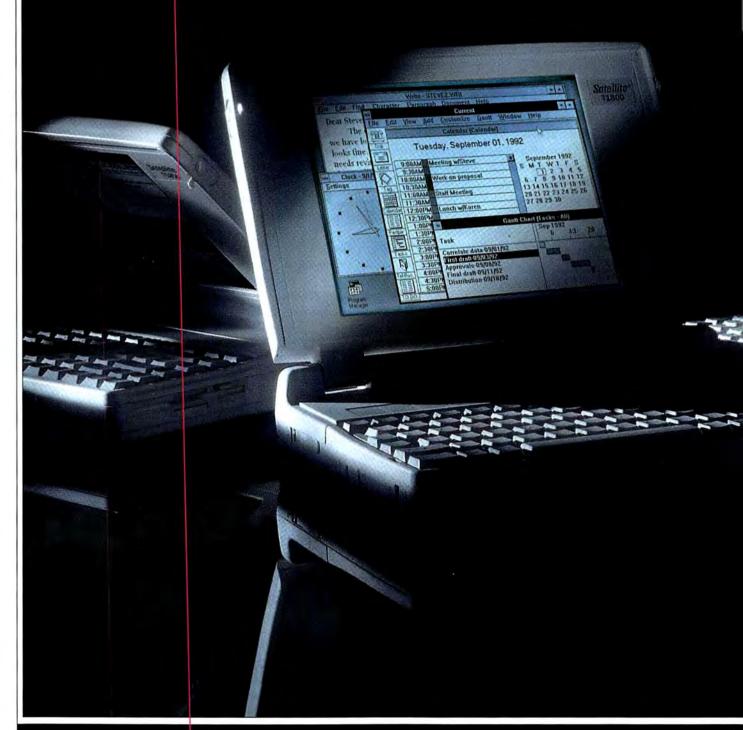
XGA2: Get the Bugs Out

The IBM PS/2 Model 56 486SLC2 is based on the same motherboard used in the Reply system in the main review. In fact, IBM manufactures the Reply motherboard. We believe the IBM PS/2 Model 56 would perform just like the Reply system. Once the bugs are eliminated from the XGA2 and its drivers, the IBM system might even turn in

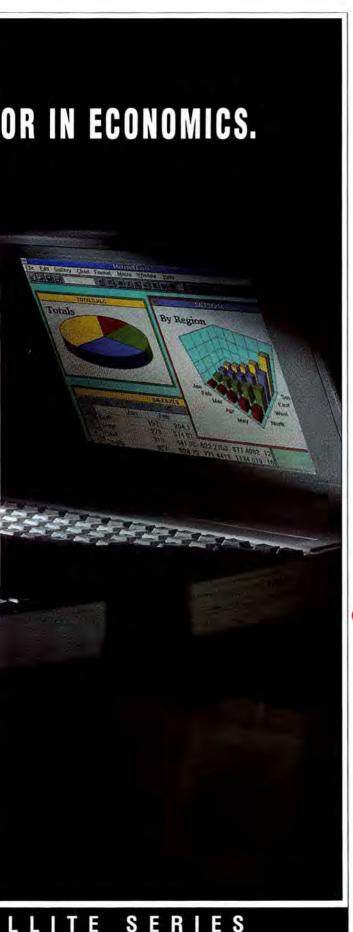
price \$100 more than the Reply's and would have ended up a slightly better overall value—not good enough to rate a Best Buy but certainly in the top half of the review.

It's unfortunate the system had problems passing our tests—especially since IBM once defined compatibility. We also were disturbed by the difficulty we had getting IBM to discuss which of its systems would be the most sensible to buy. These experiences can be seen as vestiges of the "old" IBM. The "new" IBM has been making changes. Its new ValuePoint lineup is very competitive on price. We will be examining it in upcoming reviews and are hopeful the next generation of IBM systems will offer better standardization and price levels without sacrificing the quality and support IBM is famous for.

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They also packed the same 25MHz 386SX processor, RAM and hard drive options into our T1850 LCD model. And gave our most modestly priced model, the T1800, a not-so-modest 20MHz 386SX, 2 to 10 MB of RAM and a 60MB hard drive.

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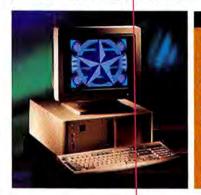
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Eltech Research Model 4330



VITAL STATISTICS

Processor: Intel 486DX-33 Direct price: \$2079 PROS: Good price CONS: Midpack performance Contact: 800/358-8330, 510/438-0663 (tax) Reader service no. 701

Between October 1991 and March 1992, Eltech systems won three Best Buys—an impressive record. In our June 1992 review, this Eltech DX-33 received top marks for performance and price and worthy scores for expandability and service. A Model 4330 with a somewhat different configuration just missed winning a Best Buy in last month's review of *Windows* machines. Here, in a review that examines the cessors now available, the Eltech Research Model 4330 places 9th for overall value—not bad are a virtual dead heat.

Built around the third fastest processor in the roundup, the Eltech produced middle-of-the-road speed marks, both for its 33-MHz 486DX processor class and for the review as a whole. Its overall Windows numbers were about 60 percent slower than the fastest system here, although it was faster than a couple of DX2-50s on the Excel section. It did better on our BAPCo test suite, particular-

In a review examining the best systems that use the plethora of processors now available, the 33-MHz 486DX Eltech Research Model 4330 places ninth for overall value.

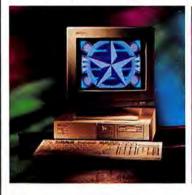
ly on the word processing and spreadsheet segments. The \$2079 price is also about average for that class, yielding a very high price/performance rating.

Eltech provides 64K of external memory cache expandable to 256K, a Diamond Stealth VRAM graphics accelerator card, and a 119MB Seagate ST3144A hard drive. What's more, the company throws in a free copy of *Microsoft Word for Windows*. Expandability is more than adequate: You get six free expansion slots and five total drive bays, all of which can accommodate removable-media drives. If you need to kick up performance in the future, you'll be able to swap in a 33/66-MHz Over Drive processor.

Eltech's service and support leaves little to be desired. A year of on-site service costs a reasonable \$69, the off-site service policy calls for a two-day turnaround, and the toll-free technical support is available during normal business hours and on weekends.

Extras like these have helped Eltech make a strong showing in the past. Even among machines sporting faster performance and rock-bottom prices, the Eltech remains a very respectable value but unfortunately, not respectable enough to make it a Best Buy this time around.

Hewlett-Packard Vectra 486/66N PC Model 170



VITAL STATISTICS Processor: Intel 486DX2-66 Street price: \$2624 PROS: Compact case, integrated local-bus video, fine design CONS: Limited expandability Contact: 800/752-0900 Reader service no. 702

Systems in Hewlett-Packard's N series are sleek, low-profile compacts designed for use as network nodes. If you can get by with fewer peripherals, the Vectra 486/66N PC Model 170's three free 8/16-bit slots should be adequate. But two 3%-inch drive bays are too few—even with a big hard disk in the server down the hall, you're limited to a local hard disk and one 1.44MB floppy drive. If you want more room for peripherals and performance extras like an external RAM cache, you'll want to take a look at HP's U series version of this system instead.

While this 66-MHz 486DX2 computer is fast, it was the slowest by far of the 66s, and even two 50-MHz 486DX2s cranked out better overall test scores. Its best performance came on the *Word for Windows* section of our *Windows* suite. The PC World Test Center's control technicians suggested that if this system had an external

RAM cache (typical on most 486s), it would have performed much better, especially considering HP's integrated S3-based local-bus video setup, which should be plenty speedy, especially for *Windows*.

We've come to expect something extra from the design of Hewlett-Packard sys-

tems, and this one doesn't disappoint us: It has an easy-open case and a motherboard that's accessible and beautifully laid out. All the ports are labeled on the back, and the documentation is top-notch. Hewlett-Packard also provides an excellent low-radiation monitor, a generous 163MB Quantum hard drive, and a cooling fan that directs a steady stream of air over the DX2 CPU, making a heat sink unnecessary.

When it comes to service and support, Hewlett-Packard ranks very high, providing a free year of its own highly regarded on-site service (most companies contract with third-party providers). In addition, HP provides a toll-free line (weekdays only) staffed by technicians who, in our experience, even make follow-up calls to ensure that their advice worked.

At \$2624, the HP's price is very reasonable for a 66-MHz machine, although the Best Buy AST beats it by about \$200. If you don't need capacity for more than two externally accessible drives and you want a small, relatively fast workstation, HP's fine design and customer service make the N appealing. For most buyers, however, Best Buy values like the 66-MHz AST and the 50-MHz Acer are better choices.

Insight 486-33 ISA Cache



VITAL STATISTICS

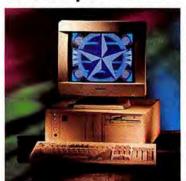
Processor: Intel 4860X-33
Direct price: \$1999
PROS; Good expandability, software bundle, excellent price/performance
CONS: No on-site service
Contact: 800/755-9628,
602/3501182 (fax)
Reader service no. 703

At \$1999, the 486-33 ISA Cache is the second least expensive DX-33 here. Although Blackship's DX-33 is \$200 cheaper, Insight provides a big 203MB Western Digital Caviar 2200 hard disk and adds free copies of *Stacker* compression software and *Dr. Solomon's Anti-Virus Tool Kit.* As for speed, the Insight ranked at the bottom of the DX-33s in this review, but its performance is still very respectable. Like most standard tower models, the Insight offers good expandability. The half-size motherboard has six free slots.

The main problem we had with Insight is its lack of on-site service. Insight is the only company in this review that doesn't provide at least an on-site service option. Insight says that it once offered on-site service, but its third-party service providers didn't do an adequate job. Insight says it now spends the money improving the quality and hours of its tech support operation. You can call the toll-free support line, and a technician will walk you through most simple repair jobs over the phone. If that doesn't work, you'll have to send the malfunctioning machine back to Insight, and the company will send you a permanent replacement in exchange. In our experience, Insight technicians provided excellent help.

If you already have an in-house support staff or you're comfortable handling your own repairs, the lack of on-site service may not concern you. The system does have a good balance of price, performance, and expandability—and it ranks in the top third of the overall values here.

Micro Express ME 486DLC



VITAL STATISTICS

Processor: Cyrix 486DLC-33 Street price: \$1699 PROS: Low price, fast for a DLC, excellent customer support CONS: None Contact: 800/989-9900, 714/852-1400 Reader service no. 704

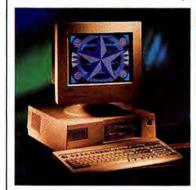
This unassuming DLC-based system may not look like much at first, but it manages to pack enough value into its compact case to place it just one rung below the five Best Buys. At \$1699, it's the fifth least expensive system here—only

about \$100 more than the bargain-priced Reply Model 16 486-SLC2. Thanks in part to its big 256K external memory cache, the ME 486DLC is one of the fastest DLC-based systems overall (virtually tying the CompuAdd for first), with especially good times on the *Excel* and *Paradox* tests. The Micro Express nosed out four of the 25-MHz Intel 486SXs overall, although generally the speeds of these two processor classes seem quite comparable.

Micro Express wisely doesn't limit your upgrade options: If you want more speed, the system has a socket for the Intel OverDrive chip, so you can upgrade it to 66 MHz. There's also an 80387 socket. The ME 486DLC provides six free slots and five drive bays, with one internal and two externally accessible bays free.

Micro Express hits the top five for service and support, with a year of on-site service for \$50, an outstanding two-year warranty, and a two-day turnaround policy. Cap this off with toll-free, round-the-clock, 365-days-a-year technical support, and you have a super service package. Excellent service plus great price and upgradability make this system the only DLC to place in the top ten for overall value. If you have about \$1700 to spend on a respectable performer that's also an upgradable business machine, you may have just found your PC.

NEC PowerMate 486/50i-DX2



VITAL STATISTICS

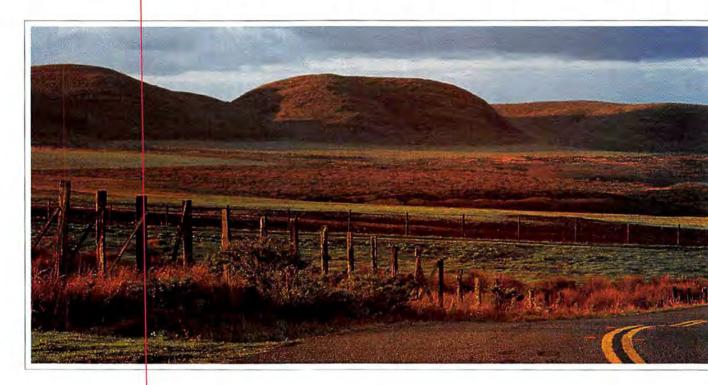
Processor: Intel 4860X2-50 Street price: \$2533 PROS: Local-bus video, compact case, 15-inch monitor CONS: Expensive, unremarkable performance Contact: 800/388-8888, 508/264-8000 Reader service no. 705

When we reviewed this basic system in our October roundup of 50-MHz 486DX2s, we praised it for its top-notch design, and we're still impressed with the way it's put together. NEC has integrated its fast Image Video local-bus graphics controller on the motherboard, and the 64K external memory cache (upgradable to 128K) is installed in an upside-down module that sits on the motherboard like a miniaturized card table. These tricks, along with some others, enabled NEC to wrap this system up in an ingeniously compact package. And you can find out plenty about the system by paging through NEC's clear, easy-to-read documentation. What's more, NEC also provides a wonderful 15-inch NEC MultiSync 3FGx monitor.

In October we deducted points for the PowerMate's so-so performance and price. The same problems persist: The NEC's \$2533 price is the highest in its processor class, and while the system's performance is decent, it strays near the bottom of its processor class. NEC's service-and-support package is highly competitive. You get a year of free on-site service, a two-day turnaround policy, and toll-free technical support (weekdays only).

It's interesting to note that the 50-MHz 486DX2 processor class proved to be one of the overall best buys of the seven processor

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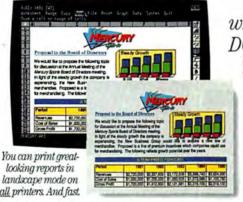
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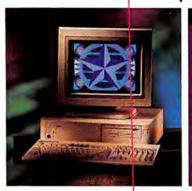


Lotus 1-2-3 for DOS

COVER STORY 486 SYSTEMS

types covered in this review. While the NEC machine was the least attractive value of the 486DX2-50s, it still rated in the middle of the pack for value. And in addition to its fine design and quality, if you treasure its 3FGx monitor, its value climbs up among the best.

PC Brand Leader 486/DLC



VITAL STATISTICS

Processor: Intel 486DLC-33
Direct price: \$1695
PROS: Low price, ZIF socket for any 486 CPU
CONS: Slowest in roundup
Contact: 800/722-7263,
805/378-7801 (fax)

Reader service no. 706

At \$1695, the PC Brand Leader 486/DLC is within about \$100 of being the cheapest PC in the roundup. Despite being economical, however, it has the second worst overall value of any system reviewed. Why the dismal rating? Because this machine was the slowest system here by a considerable margin and 70 percent slower than the next slowest DLC. The main reason: Incompatibilities between this system and the BAPCo test suite. On the bright side, the system's performance on Word for Windows and Paradox approached the best of the DLCs, which indicates that once PC Brand irons out the wrinkles, this could be a very good system. To the company's credit, they worked with us for long hours trying to correct the problems.

The system has terrific features packed under its low-rise hood. It uses a universal ZIF socket that accepts any Intel 486 CPU. Finally, you get five free slots and a total of four externally accessible drive bays, although on our unit three of the bays were filled.

Despite this system's low price, decent design, and performance potential, we can't recommend it until PC Brand can correct its compatibility problems.

Reply Model 16 486SLC2



VITAL STATISTICS

Processor: IBM 486SL02:40 Street price: 51578

PROS: Lowest price in roundup, CPU-card upgrades to 50-MHz 486DX2

CONS: No chip-level upgrade, no external RAM cache Contact: 800/955-5295

Reader service no. 707

There was a time when *inexpensive* and *Micro Channel* were mutually exclusive terms. But times are a-changin', and Reply now sells Micro Channel (MCA) PCs with impressively low prices. The company's Model 16 comes with an IBM

486SLC2 processor installed in an IBM motherboard, and it sports the best price in our roundup: a mere \$1578.

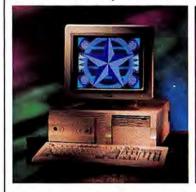
Not only is this system cheap, but contrary to what you might expect, its low price doesn't mean bottom-of-the-barrel performance. Sure, this processor doesn't compare to Intel's top performers, but it's faster overall than three of the 25-MHz 486SXs and one of the 33-MHz 486s. It did poorly on our *Windows* tests, hitting a consistent 22nd on every section—about 30 percent behind the fastest systems. On the DOS-heavy BAPCo test, the Reply did better, with an especially impressive showing on the software development section of the suite. For this kind of money, that's a fine showing.

Reply systems have a reputation for being very well designed and constructed, and this PC is no exception. It includes an IBM-grade Lexmark keyboard and an easy-open case. While you can't swap out the processor on the CPU card, you can choose from 33-MHz 486DX, 50-MHz 486DX, or 50-MHz 486DX2 upgrade cards. For a compact box, the five free Micro Channel slots are a generous complement, as are four total drive bays with one externally accessible bay still free.

Service and support is solid, with a year's on-site service costing \$75. Repairs requiring factory service are supposed to be turned around in two days, and toll-free support lines are available week-days. Another point in Reply's favor: It's one of the few dealer-channel vendors in the roundup that requires dealers to have a dedicated support staff trained by the vendor.

Although its processor is not one of the faster CPUs here, the fantastic price, fine design and construction, and solid service speak well for this system. If you're looking for an economical Micro Channel solution and don't need maximum power, the Reply Model 16 486SLC2 makes a great buy.

Swan 486SX/25DB



VITAL STATISTICS

Processor: Intel 486SX-25
Direct price: \$2405
PROS: Two-years free on-site service, CPU-card or OverDrive upgrades
CONS: Poor price/performance
Contact: 800/468-9044,
814/237-4450 (fax)
Reader service no. 708

It's usually hard to find negatives in the Swan picture. For one thing, this company offers one of the best service-and-support packages around, with an outstanding two years of free on-site service to back up its two-year warranty. In addition, Swan provides tollfree technical support and works on Saturdays.

However, this Swan model's price is high, considering its comparatively slow 25-MHz 486SX CPU. At \$2405, this PC costs more than all but one of the DX2-50s and all but one of the DX-33s. Though it ran in the middle of the SX-25 pack on our benchmarks, it finished toward the bottom of the rankings overall. It was about half as fast as the speediest DX2-66 on virtually all our benchmarks.

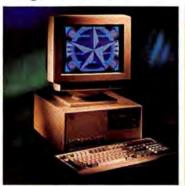
Swan provides a variety of ways to upgrade. The most economical would be to swap in a new 25/50-MHz OverDrive CPU on the existing processor card. But you can also buy upgrade cards that are capable of handling 33-MHz or 50-MHz 486DXs. Since the CPU board contains the processor, RAM, and BIOS, you know that these upgrades (and any future processor offerings) will have components that match perfectly.

Furthermore, the CPU module also holds an S3 video controller chip that's connected directly to the CPU using Swan's proprietary Direct Bus video architecture. Because the video subsystem is incorporated into the CPU board, you should be able to improve your video whenever you upgrade the CPU (assuming Swan incorporates future improvements in video technology into future processor boards).

In addition to the CPU and video upgradability, the Swan 486-SX/25DB gives you five expansion slots as well as four drive bays inside its full-size desktop case. The hard disk is a 124MB Maxtor 7120AT.

We would like to like this system more than we do. It may just be that we happened to eatch Swan between periodic price changes. Or it may just be the company's bad luck that we asked for a model with a processor that wound up ranking as one of the lowest overall values in our roundup. This basic system is essentially a good one; we just wouldn't suggest that you buy it with a 25-MHz 486SX installed.

Tangent Model 450ix



VITAL STATISTICS

Processor: Intel 486DX2-50 Direct price: \$2150 PROS: Low price, last on Windows tests, eight free slots CONS: Obstructed CPU socket Contact: 800/466-3300. 415/342-9380 (fax) Reader service no. 709

In our October review of DX2-50s, the Tangent Model 450ex, loaded with a 256K external RAM cache, a 208MB SCSI hard disk, and a 4MB caching disk controller, missed being a Best Buy by the slimmest of margins, mainly because of its high \$4585 price.

The ISA-bus Model 450ix in this review is a different story: At \$2150, it has the second best price in its processor class and is cheaper than several less powerful machines. Combine this affordability with good performance, expandability, and service, and you see why this time Tangent rates a solid Best Buy.

As in October, the Tangent impressed us with its speed. The 450ix is the 2nd fastest DX2-50 here and the 6th fastest system overall-but trust us, you wouldn't be able to perceive the difference between its speed and the 5th-ranked Acer's. It was the 3rd fastest system in our Windows test suite, with especially good times in the Excel and Word sections. It also did well on the database and graphics BAPCo benchmarks but came in a disappointing 18th in the software development test. If we isolate just price and performance, this system winds up ranking 2nd overall in the review and best in the DX2-50 class.

The Tangent Model 450ix gets high points for expandability too, with an outstanding eight slots free. You get five drive bays-two of which are filled with the standard floppy drives, one occupied by a 119MB Maxtor 7120AT hard drive, and two externally accessible

Late List Prices

Every PC review we've run in the last seven months has reported late price reductions, with the most dramatic plunges coming in summer and early fall. The drops became so steep that we wondered when they would bottom out. Over the last few months, the slope has leveled, and it now appears that prices are descending more gradually. The exceptions are the lower-priced systems: The biggest proportional cuts are on entry-level 486SX-25 and 486DLC-33 PCs. This trend bears watching; as their prices drop, these low-cost systems become more attractive values. So if you're a bargain hunter, it's worth making calls to vendors asking about the prices on their economy models.

Price Cuts Deepest on the Low End

Acer AcerPower 486e DX2/50 Model 5557	\$3299	none
Acma 486DX2/50	\$2395	\$100
ALR Flyer 32 LCT	\$3464	none
AST Bravo 4/66D Model 123B	\$3205	\$100
ATronics Int'l ATI-486SX/25	\$1695	\$100
Austin 486/DLC-33	\$1690	none
Blackship BLK 486/33 ISA	\$1695	\$100
Compaq Deskpro 4/66i Model 120	\$3590	\$354
CompuAdd 433DLC	\$1944	\$316
CompuAdd Express 425CX	\$1618	none
CompuTrend Premio 486SX/25	\$1349	\$410
Copam 486SXB/25	\$1687	\$442
DEC DECpc 466d2 LP	\$2969	none
Dell 486D/66	\$3218	none
Eltech Research Model 4330	\$2079	none
Hewlett-Packard Vectra 486/66N PC Model 170	\$3197	\$301
Insight 486-33 ISA Cache	\$1999	none
Micro Express ME 486DLC	\$1699	none
NEC PowerMate 486/50i-DX2	\$3200	\$133
PC Brand Leader 486/DLC	\$1395	none
Reply Model 16 486SLC2	\$2019	\$446
Swan 486SX/25DB	\$2099	\$306
Tangent Model 450ix	\$2150	none
USA Flex 486/33 Cache	\$2199	\$116
Zeos 486DX-33	\$2694	\$150

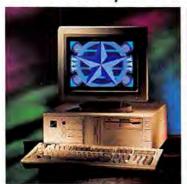
COVER STORY 486 SYSTEMS

bays left free. The system's graphics chores are handled capably by a Diamond Speedstar 24X accelerator. The only quibble that we have with this system is that the CPU and Weitek sockets' position under the drive cage impairs their accessibility. That restriction could make the job a little more difficult if you decided to swap the replaceable 25-MHz clock for a 33-MHz unit and swap in a 33/66-MHz OverDrive.

Service is also good: You get one full year of free on-site service, a three-day turnaround policy, and toll-free technical support on weekdays. The Tangent technicians did their usual good job at fielding our queries.

Adding up the results, the Tangent Model 450ix is faster than most systems in its processor class and less expensive than they are, too. The unit also offers top-notch service, and it gives you plenty of room to grow. Any way you figure it, this Best Buy is a solid choice for anyone looking for a speedy, reliable system.

USA Flex 486/33 Cache



VITAL STATISTICS

Processor: Intel 486DX-33
Direct price: \$2315
PROS: Great service and support, fast in its class
CONS: High price
Contact: 800/769-3539,
708/351-7204 (fax)
Reader service no. 710

This system won a Best Buy in our June review of 33-MHz 486DXs thanks to excellent performance, a low price, friendly service, and good expandability.

This time around, although it's still a top ten value, it didn't quite make it into the top five, mainly because of a relatively stiff \$2315 price. Only the Zeos 486DX-33 costs more in the 33-MHz 486DX

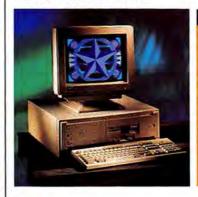
class, and as you'll see, Zeos throws in some enhancements and freebies that mitigate the extra expense.

On the upside, USA Flex backs up this system so well that it places in the top five for customer service and support. The company's tech support lines are open around

the clock, 365 days a year; you get a year of free on-site service; and off-site repairs are supposed to be turned around in two days. Also, the system's performance is quite good: It's the second fastest DX-33 overall, with particularly good times on the *Freelance* and *Excel* portions of our *Windows* tests, in which it was the seventh fastest system overall.

This compact desktop unit offers a respectable six free slots and an impressive seven total drive bays, and one internal and three externally accessible bays are free. In addition, USA Flex installed both standard floppy drives and a big 203MB Western Digital Caviar 2200 hard disk. While we can't renew the USA Flex 486/33 Cache's Best Buy honors this time around, we can still recommend the system, without hesitation, as a very fine value.

Zeos 486DX-33



VITAL STATISTICS

Processor: Intel 486DX-33
Direct price: \$2844
PROS: Fastest 33 MHz 486DX, excellent design, Lotus software hundle
CONS: Relatively pricey
Contact: 800/423-5891, 612/633-1325 (fax)
Reader service no. 711

How does a system become a Best Buy? Speed is a crucial factor. The Zeos 486DX-33 is the fastest 33-MHz 486DX system we tested, and its performance even topped that of two 50-MHz 486DX2s. The Zeos posted especially good times on the graphics and software development sections of the BAPCo test suite and on the *Paradox* test.

Intelligent design is another piece of the Best Buy puzzle. Inside the full-size desktop case, you'll find two fans, one for the power supply and the other strategically aimed to cool the expansion cards. Two of the slots are VESA local-bus slots, one of which holds a Weitek Power 9000–based video accelerator card and one of which is free, along with five 8/16-bit slots and an 8-bit slot. With seven drive bays, you'll never be hurting for a place to install a drive.

Zeos provides a 25/33/50-MHz switchable clock and a 238-pin ZIF CPU socket, which means you can upgrade to any Intel 486 CPU (including the 66-MHz 486DX2) or plug in the next-generation, Intel Pentium-based OverDrive when it's available. In addition, Zeos gives you a SCSI connector on the motherboard, and for a few bucks more you can get an optional extension to provide an external SCSI port. It's hard to imagine a brighter upgrade picture.

At first glance you may be taken aback by the \$2844 price. After all, this *is* the most expensive DX-33 in the roundup, costing more than any of the DX2-50s and two of the DX2-66s. But the price

How does a system become a Best Buy? Speed is a crucial factor. The Zeos 486DX-33 is the fastest 33-MHz 486DX system we tested, and its performance even topped that of two 50-MHz 486DX2s.

includes a capacious 234MB Seagate ST3283A hard disk and your choice of two of these three Lotus software packages: 1-2-3 for Windows, Ami Pro, and Freelance Graphics. If you can use the software and factor in its value, that price starts to look pretty good. You also get a connection to Zeos's seven-days-a-week, 24-hours-a-day toll-free technical support, and a year of on-site service costs a reasonable \$49 (second and third years cost just \$99 each). When we called tech support, they answered the phone promptly and responded accurately. This is a fast, beautifully designed PC with an upgrade path that just won't quit. That spells Best Buy to us.

For more information about all products in this article, circle reader service no. 902.

66-MHz 486DX2s Are Noticeably Faster Than the Competition

	Freelance for Windows 1.0	Excel 4.0	Word for Windows 2.0	Paradox 3.5 in DOS window	BAPCo SYSmark92**
AST Brayo 4/66D Model 123B* (Intel 486DX2-66)	133	103	138	125	149
Compaq Deskpro 4/66i Model 120 (Intel 486DX2-66)	141	88	110	128	126
Dell 486D/66 (Intel 486DX2-66)	143	113	152	154	135
DEC DECpc 466d2 LP (Intel 486DX2-66)	157	126	166	137	131
AcerPower 486e DX2/50 Model 5557* (Intel 486DX2-50)	170	112	152	158	121
Tangent Model 450ix* (Intel 486DX2-50)	179	104	124	167	113
HP Vectra 486/66N PC Model 170 (Intel 486DX2-66)	191	142	150	214	107
Zeos 486DX-33* (Intel 486DX-33)	192	147	181	196	108
NEC PowerMate 486/50I-DX2 (Intel 486DX2-50)	189	144	174	204	103
USA Flex 486/33 Cache (Intel 486DX-33)	190	128	166	208	97
Acma 486DX2/50* (Intel 486DX2-50)	191	148	199	180	104
Blackship BLK 486/33 ISA (Intel 486DX-33)	251	129	147	204	88
Eltech Research Model 4330 (Intel 486DX-33)	196	144	175	217	88
Insight 486-33 ISA Cache (Intel 486DX-33)	227	172	198	228	93
ALR Flyer 32 LCT (Intel 486SX-25)	267	184	211	244	86
CompuAdd 433DLC (Cyrix 486DLC-33)	247	181	218	245	83
Micro Express ME 486DLC (Cyrix 486DLC-33)	259	172	225	226	80
Austin 486/DLC-33 (Cyrix 486DLC-33)	262	178	213	255	78
ATronics Int'l ATI-486SX/25 (Intel 486SX-25)	247	172	212	287	76
Reply Model 16 486SLC2 (IBM 486SLC2-40)	272	216	261	293	80
Swan 486SX/25DB (Intel 486SX-25)	268	212	257	284	75
Copam 486SXB/25 (Intel 486SX-25)	302	227	273	305	73
CompuTrend Premio 486SX/25 (Intel 486SX-25)	374	255	275	399	59
CompuAdd Express 425CX (Cyrix 486SLC-25)	380	289	320	398	53
PC Brand Leader 486/DLC (Cyrix 486DLC-33)	232	185	216	240	31

*Best Buy

Systems are arranged in order of overall speed, from fastest at top to slowest at bottom.

**All test results in seconds except for the BAPCo test, which measures scripts per hour.

Methodology All tests were run using systems configured as standard. If we had to install Windows, we performed the default installation. We configured Windows with a Hewlett-Packard LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. Using vendor-supplied video drivers when possible, we set the resolution to 800 by 600 pixels. On systems unable to support 16 colors at that resolution, we used 256.

Freelance for Windows 1.0 We load a single-page starter

file containing a United States map with each state a separate object. Then we build a six-page presentation using charts and preview it five times with different effects. Finally, we save the presentation to disk.

Excel 4.0 We perform several data extracts; build and format a financial statement and print it; and open a mortgage analysis, scroll, move blocks, change the interest rate, print preview the statement, and save it.

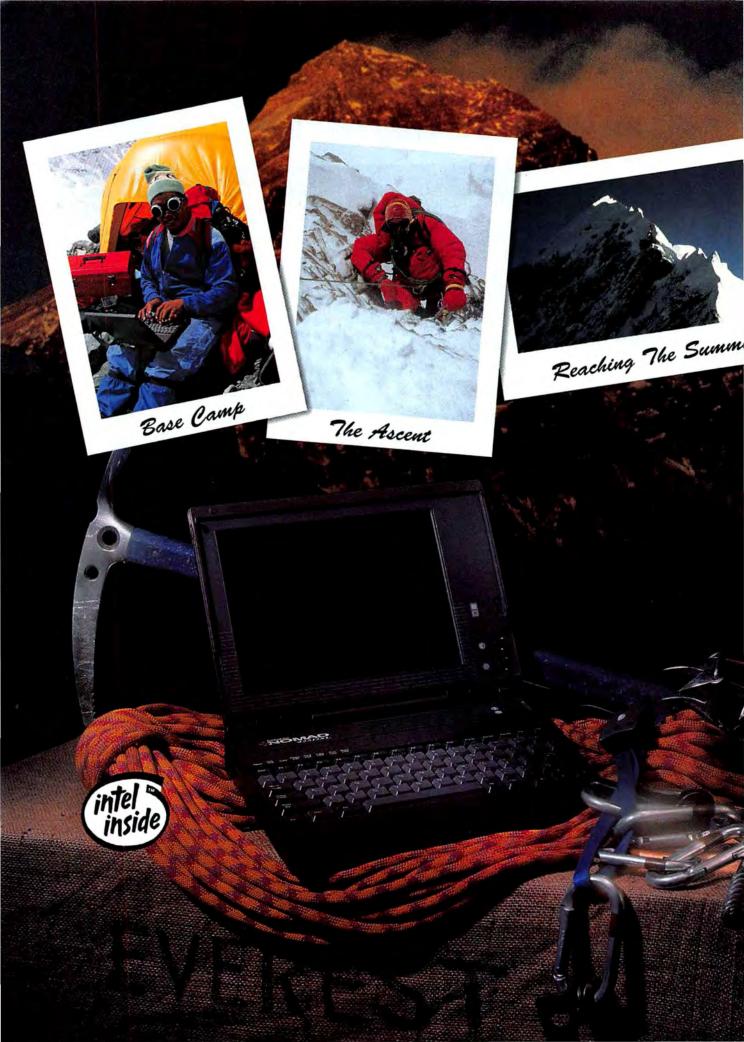
Word for Windows 2.0 We use the spelling checker and scroll through a 27-page document; create, format, print, and save a single-page business letter; and open a business proposal, add a paragraph, preview, and print it.

Paradox 3.5 In DOS window Running the program in a

DOS window, we perform a variety of data entry, record searching, and updating tasks. Then we generate reports using a simple customer list.

BAPCo SYSmark92 We run a scripting program that loads common database, desktop publishing, presentation graphics, software development, spreadsheet, and word processing applications and executes a variety of typical tasks with each. The following software packages are all used in this test: Aldus PageMaker 4.0, dBASE IV 1.1, Harvard Graphics 3.0, 1-2-3.3.1, Microsoft Excel 3.0, Microsoft Word for Windows 2.0, Paradox 3.5, Quattro Pro 3.0, and WordPerfect 5.1.

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



Going to Extremes

If you want to know what the Gateway 2000 Nomad notebook PC can endure, just ask mountaineer Wally Berg. He took the Nomad 425DXL with him last fall on an expedition to the highest point on earth — the majestic, 29,128-foot Mount Everest in the Himalayan Mountains of Nepal.

Wally used the Nomad daily to track supplies, budget, and events of the climb. "Despite being transported over rugged terrain by yak, and operating in an unheated tent with temperatures outside of 20 to 30 degrees below zero, the Nomad performed flawlessly," said Wally. "The size was perfect, too. We had so many supplies to carry that size and weight were a big consideration."

Wally powered the Nomad with three sets of NiCad batteries which he recharged with a solar panel. Wally said the batteries weren't affected by the frigid temperatures. Each battery always lasted up to six hours.

The expedition left for its final climb to the Everest summit shortly after midnight on October 9. They ascended toward the peak by moonlight, reaching the top at 8 a.m. "It was a feeling of total exhibitantion to finally reach the highest point in the world," said Wally.

Even if you don't plan to take your Nomad to Mount Everest, it makes the perfect traveling companion wherever you journey. The Nomad weighs just 5.6 pounds and measures 8.5 x 11 x 1.8 inches. Standard features include: a 25MHz Intel* 486SX or 486DX processor; 4MB RAM; an 80MB hard drive (425SXL model) or a 120MB hard drive (425DXL model); a 3.5-inch diskette drive; a 10-inch backlit VGA screen; a comfortable 79-key keyboard and FieldMouse* portable pointing device; MS-DOS,* Windows* and Works for Windows.* Perhaps the most attractive feature is the price:

Nomad 425SXL ■ \$1995 Nomad 425DXL ■ \$2695

A Nomad gives you portability, 486 desktop performance, a great screen and keyboard, outstanding battery life — plus incredible durability. So take it from Wally Berg. If the Gateway Nomad can endure an Everest expedition, it can take almost anything!



610 Gateway Drive • P.O.Box 2000 • North Sioux City, SD 57049-2000 605-232-2000 • Fax 605-232-2023

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FEATURES COMPARISON

50-MHz DX2s Top the Best Buy List

18	BEST BUY BEST BUY AROUND TO ACOUNT ACCOUNT TO ACCOUNT T	Fixer 32	Bravo 1238	द्य मु	486/VL	BLK ABOUT	Model 120 Model 120 Model 120 Model 120	A33DLC Compad A/66i	Compuadd	San \
• Yes	360	3 7	1 60	1 48		3 8	15 E	10 P	是 这	1
○ No	1 1 6 8 .	25	ह्य हिं	66	艺重\	8 1	30 18	P	盘	a l
n/a= not applicable	20 Met	-	- /-	0	8-	~	151	8	1	E
Standard features	/ /	\	1		\	\				computed Express
Direct/street price 10/15/921	\$2243	\$2071	\$2009	\$2413	\$1795	\$1846	\$1795	\$3037	\$2260	\$1618
CPU	Intel 486DX2-50	Intel 486DX2-50	Intel 486SX-25	Intel 486DX2-66	Intel 486SX-25	Cyrix 486DLC-33	Intel 486DX-33	Intel 486DX2-66	Cyrix 486DLC-33	Cyrix 486SLC-25
Bus	EISA ⁵	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA
Hard disk	Conner CP30204	Seagate ST3144A	WD Caviar 2120	Quantum ProDrive	Conner CP30104	Conner CP30104	Maxtor 7120A	Quantum	Seagate ST3144A	Seagate ST3144A
Size (MB)	202	119	112	116	116	116	124	116	119	119
Motherboard	Acer	ISA-486	ALR	AST	ATronics	Austin	AMI	Compaq	ВСМ	CompuAdd Express
Graphics controller	Power- Vision Accelerator	Orchid Fahrenheit 1280	integrated WDC 90C30-ZS	integrated CL-GD54- 22-75QC-A	Diamond Stealth VRAM	OEM	Orchid Fahrenheit 1280	integrated QVision	integrated Tseng 4000AX	integrated WDC WD90C31
Monitor	AcerView 34T	Mag	ALR SVGA	AST CM41	CTX SVGA	CTX CVP- 5468NI	ViewSonic 6	Compaq 1024	CompuAdd Samtron SC-428VS	CompuAdd Express SVGA
Diagonal size of viewable area (inches)	14	15	14	14	14	14	14	14	14	14
expandability										
External memory cache: installed/maximum (K)	256/512	64/256	256/256	256/256	256/256	128/256	64/256	64/64	128/128	0/0
Free 32-/16-/8-bit expansion slots	4/2/0	0/4/1	0/10/0	0/4/0	0/5/1	0/4/2	0/6/1	0/3/0	0/3/2	0/3/2
Externally accessible 3½-inch/5¼-inch drive bays	1/3	1/3	0/5	0/2	0/6	0/3	2/2	1/1	1/1	1/1
Internal 3½-inch/5¼-inch drive bays	2/0	0/0	6/1	1/1	3/0	2/0	1/0	1/0	1/0	1/0
CPU upgrade options		-								
Faster replaceable CPU board	n/a	n/a	6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
User-adjustable or user-replaceable clock	•	•	n/a	•	•	0	•	•	•	0
Accepts OverDrive CPU	•	•	•	•	•	0	•	•	•	0
ZIF socket	0	0	0	•	0	0	0	0	0	0
Weitek socket	0	•	0	0		•	0	0	0	0,11
Design and construction										
Case	compact	compact	tower	compact	tower	compact	minitower	compact	compact	compact
Parallel/serial/mouse/game ports	1/2/1/0	1/2/0/1	1/2/1/0	1/2/1/0	1/2/0/1	1/2/0/1		1/2/1/012		1/2/0/0
Service and support	1									
Warranty (months)	12	12	12	12	12	12	12	36	12	12
On-site service price per year	free	free	\$9.95	free	\$99	free	free	free	free	free
Turnaround policy (days)	7	7	3	2	3	2	2	none	3	3
Free unlimited support	•	•	•		•	•	•	•	•	•
Toll-free central support	•	•	•	•	•	•	•	•	•	•
Daily support (hours)	12	11	11	14	9	24	9	24	24	10
Weekend support	●16	•	•	•	0	•	0	•	•	0
BBS	•	•	•	•	0	•	•	•	•	•
Fax	•	•	•	•	•	•	•	•	•	•
Vendor-to-dealer support				•					•	
Dedicated support staff required for dealers	0	n/a	0	0	n/a	n/a	n/a	0	•	n/a
Dealer support staff training required	0	n/a	0	0	n/a	n/a	n/a	0	•	n/a
Parts inventory required of dealers	•	n/a	0	0	n/a	n/a	n/a	0	•	n/a

¹ All systems include 8MB RAM, two floppy drives (unless noted), 100MB or larger hard disk, super VGA and color monitor, keyboard, mouse, DOS 5.0, and Windows 3.1. Price is either direct or the lowest price we found in calls made to multiple dealers.

² Includes Microsoft Word for Windows.

³ Includes only one floppy drive.

Includes Stacker and Dr. Solomon's Anti-Virus Tool Kit.

⁵ Includes one local-bus slot, which is used for the video controller, plus two 8/16-bit ISA slots.

^{6 33-}MHz 486DX and 66-MHz 486DX2.

	1	4860 C 46642 LP	Nodel 45	1	Hewlett-Packard	ME ADO		NEC mate	1	A865AV	1	/	1	
\$1759	\$1681	\$2969	\$3218	\$2079 ²	\$2624 ³	\$19994	\$1699	\$2533	\$1695	\$1578	\$2405	\$2150	\$2315	\$284
Intel 486SX-25	Intel 486SX-25	Intel 486DX2-66	Intel 486DX2-66	Intel 486DX-33	Intel 486DX2-66	Intel 486DX-33	Cyrix 486DLC-33	Intel 486DX2-50	Cyrix 486DLC-33	IBM 486SLC2-40	Intel 486SX-25	Intel 486DX2-50	Intel 486DX-33	Intel 486DX-
ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	ISA	MCA	ISA	ISA	ISA	ISA
Seagate ST3120A	Seagate ST1239A	DEC LR74992	Quantum	Seagate ST3144A	Quantum ProDrive	WD Cav- iar 2200	Quantum	Quantum ProDrive	Seagate ST3120A	Conner CP30204	Maxtor 7120AT	Maxtor 7120AT	WD Cav- iar 2200	Seaga ST328
100	201	116	116	119	163	203	116	116	102	202	124	119	203	234
Microstar	Copam	DEC	Dell	Eltech	Hewlett- Packard	Insight	Forex	NEC	PC Brand	IBM	Swan	ISA-486	USA Flex	Zeos
WD Paradise	Integrated Trident TVGA	integrated S3	Integrated WDC 90C31	Diamond Stealth VRAM	integrated S3	STB Evolution VGA	Aview 2/2E	Integrated Tseng ET4000AX	Integrated WDC90C30	integrated XGA	integrated S3 86C911A	Diamond Speedstar 24X	Diamond Stealth VRAM	Powe 9000
Premio	Copam	DEC	Dell	North MV-4D	Hewlett- Packard	TVM SVGA	Micro Express FM-360	NEC MultiSync 3FGx	Supercom	Reply CM-1448	Swan PMV1448	Sampo KDM-1466	FlexVision	Zeos
14	14	14	14	14	14	14	14	15	14	14	14	14	14	14
64/256	64/256	256/256	0/0	64/256	0/0	64/256	256/256	64/128	64/1024	0/0	128/128	128/256	256/256	128/2
0/4/2	0/4/0	0/3/0	0/6/0	0/6/0	0/3/0	0/5/1	0/6/0	0/4/0	0/4/1	0/5/0	0/5/0	0/7/1	0/6/0	1/5/
2/3	3/0	1/1	0/3	2/3	2/0	0/4	1/3	0/2	2/2	1/2	0/3	1/3	2/3	2/2
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0	0	n/a	n/a	n/a	0	n/a	n/a	•	n/a	0	n/a	n/a	n/a	n/a

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3292	51/4" HD Disks (Qty. 10)	monumenton	11.
3297	31/4" DS Disks (10) 9.	6148 (30)	25
3298	31/4" HD Disks (10) 15.	6375 (30)	42
8185	QD204014.	1895 QD2120	21
	3M lifetime		
3943	DC2000 17.	1581 DC2120	22
	Toshiba 2 years		
4858	31/6" 2.88 MB ED Disks (Qty.	5)	28
9755	31/2" 2.88 MB ED Disks (Qty.		

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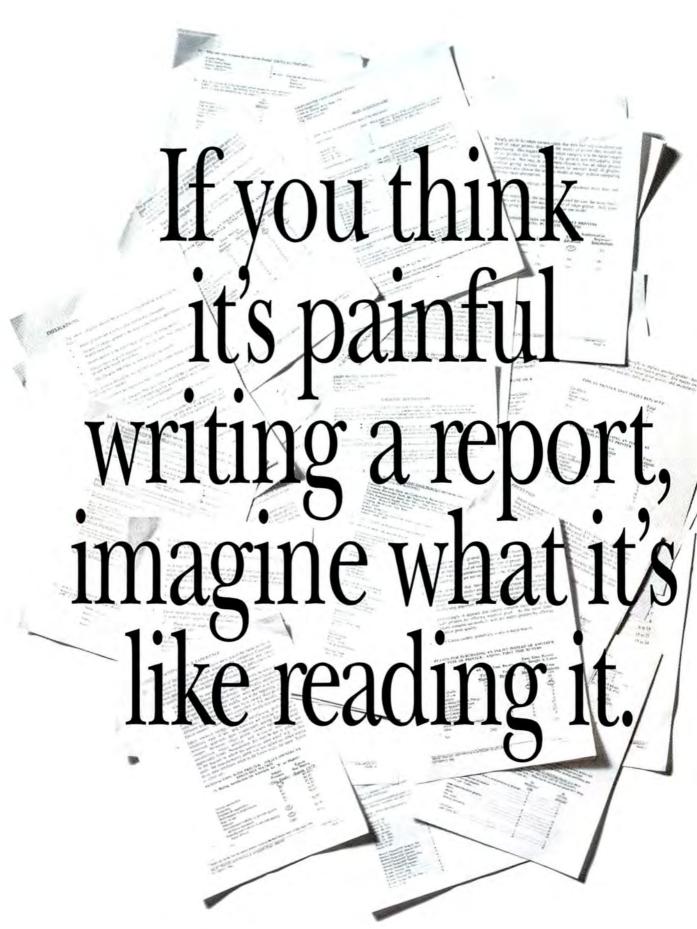
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SYSTEMS UPGRADES

Are Upgrades Worth It?

Does it make sense to beef up an old PC with the latest, greatest components? Or is it better to spend that money on a new system? Managers who've grappled with the upgrade question reveal the paths they've taken, and why.

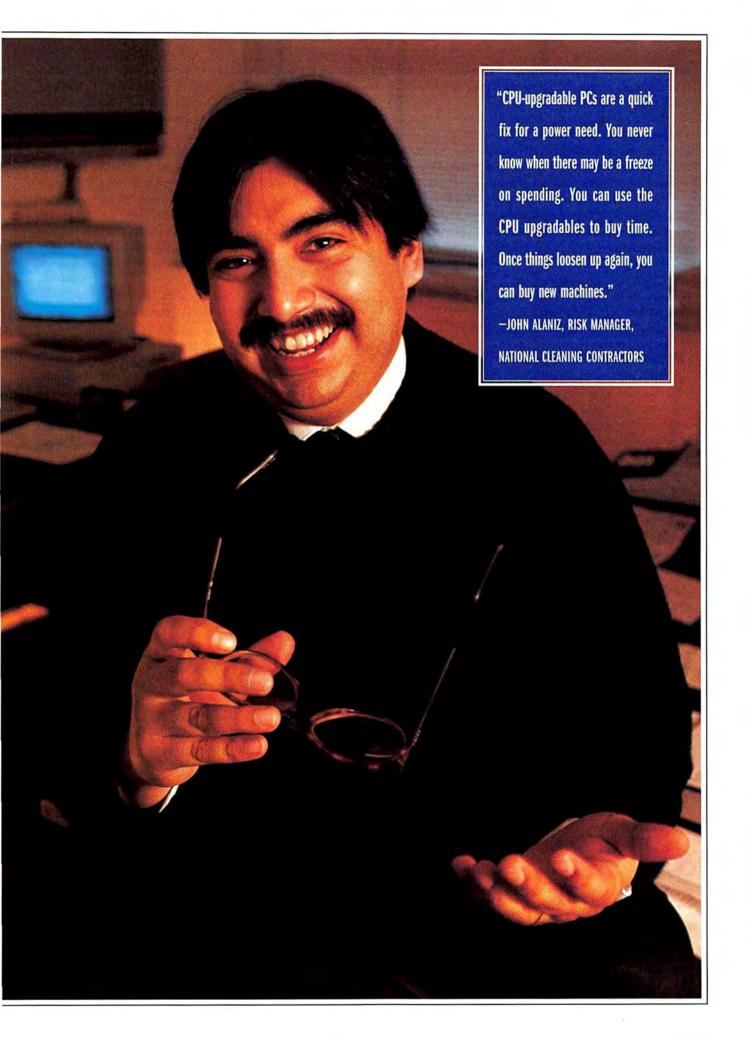
by Eric Knorr and Monika Khushf

It's the marketing concept of the decade: a PC that will never become obsolete. Just extract the CPU (and maybe a few other components), pop in a hot new chip or processor board, and voilà—a brand-new PC for the price of an upgrade. In a world where buyers avert their eyes from the latest PC ads for fear new power and prices will make their six-month-old systems look sick, who can resist the upgradable PC?

In fact, PC World's own surveys indicate that more readers are interested in CPU upgrades than in any other hardware issue. And the industry knows when it's got a winner. The majority of today's systems offer a CPU upgrade path, from processor board swaps to simple chip upgrades to switchable clock speeds that support ever faster chips.

But how do these CPU-upgradable systems fare in the office? Ordinarily, organizations pass along their older, less powerful systems to clerical workers or data entry personnel, even as they buy shiny new hot rods for power users. Have CPU-upgradable PCs changed the way people buy and distribute hardware in their company? Or do today's incredibly low PC prices make upgrading a system a losing proposition?

To answer these and other questions, *PC* World interviewed dozens of businesspeople who have struggled with the upgrade question. The managers we spoke with ranged from small-business owners to corporate micromanagers responsible for thousands of PCs. Some of these people had projected the likely effect of CPU-upgradable systems on purchasing, but most had not. In the end we



discovered that most buyers were glad for the extra "insurance" of processor upgradability, but few saw such upgrades playing a major role in their buying strategy.

A Simple Swap or a Total Transplant?

In theory, you can upgrade the CPU in any system. You can install a third-party speedup board, or even go to the effort and expense of replacing the entire motherboard. But as many of the managers we interviewed told us, unless you have an IBM PS/2 system (in which case you have a plethora of tailor-made speedup boards to choose from), installing a third-party board can take considerable expertise, and compatibility is seldom a sure bet.

Systems with CPUs explicitly designed to be replaced smooth the path from, say, 386 to 486. Many machines, such as those in AST's Premium line or Compaq's M series, use a modified passive backplane design, where the CPU sits on a card that fits in a special slot. When you need more power, you trade in the old processing card to the original vendor, buy a new one, and plug it in. Many vendors have recently gone to a chip-level scheme, which enables you to buy a new processor retail and upgrade simply by popping in the new chip.

Karen Dicks, director of technology for Information Technologists, a systems integration firm, ticks off three key advantages of true CPU upgradables. "With the modular upgradable systems, in addition to the minimal amount of effort and low cost, you have the hidden benefit that the warranty is not compromised."

Vendors openly admit that CPUupgradable systems are a great way to entice customers who can't decide whether to buy now or wait for the

next generation of faster, cheaper PCs. Julian Horwich, executive director of the Corporation for Microcomputer Professionals, runs an organization whose members' jobs depend on smart buying decisions. "The power of machines is increasing so rapidly that a month after you buy, one, it's already obsolete," says Horwich. "If you buy an upgradable system, you can just plug in a new part, and you don't look quite as wrong."

There's one problem with CPU-upgradable systems: If you want to squeeze cutting-edge performance out of an old PC, you may find the CPU is only one of several components that need replacing. If there was a common refrain among the managers we interviewed, this was it. Jo Ann Budde, manager of office support and services for Cole-Parmer Instrument Company of Niles, Illinois, speaks for many: "There is never just one thing you have to upgrade. In order to get older machines equivalent to those you're buying, you need more memory, faster drives, better monitors."

Many buyers eschew these multiple transplants. Bruce Hallberg,

director of information systems for Genelabs in Redwood City, California, downplays the importance of upgradability. "In the past," says Hallberg, "we've seen that with tremendous price cuts, the difference between upgrading and purchasing a new machine is so small that it's really more cost-effective to buy a new system."

Leslie Peckham is a technology development analyst for The Principal Financial Group. Her company bought AST Premiums back in 1988 in part because the systems were fully CPU upgradable. Nonetheless, she agrees with Hallberg. "We never upgraded. Upgrading isn't just a case of popping out an old card or CPU and popping in a new one. You have to upgrade too many other things.

Upgrading simply was not a costeffective decision."

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"There is never just one thing you have to upgrade. In order to get older machines equivalent to those you're buying, you need more memory, faster drives, better monitors."

—JO ANN BUDDE, MANAGER OF OFFICE SUPPORT AND SERVICES, COLE-PARMER INSTRUMENT COMPANY

Financial and Political Incentives

If the wisdom of upgrading an old system is questionable, why has CPU upgradability crept its way onto so many buyers' checklists? The reason cited most often is that while a full-scale disk, processor, memory, and video upgrade cost too much, a CPU upgrade alone always costs much less than a new PC. Processor swaps can become a fallback position when you can't afford a new system.

"We see CPU-upgradable PCs as a quick fix for a power need," says John Alaniz, risk manager for National Cleaning Contractors in Chicago, who recently bought three CPU-upgradable PC Brand systems. "You never know when there may be a freeze on spending, or some financial crunch. You can use the CPU upgradables to buy time. Once things loosen up again, you can buy new machines."

The low cost of CPU upgrades can turn them into a kind of stealth capital investment. "In effect you are buying

PCs, but it doesn't appear on any report that you bought a PC," says Dicks. "To the casual observer, they look like the original machines."

Horwich notes that the low-profile nature of upgrades carries a special advantage in large companies. "You may need various signatures from above based on the cost of your equipment," he says. "The lower the cost, the fewer signatures you need to get your purchase approved, and that means less headaches."

Tax benefits can provide another upgrade incentive for big organizations. "You want a system to last, especially for amortization purposes," says Dicks. "To do that, it makes sense to buy an upgradable—instead of three years you can think in terms of five."

The low cost of CPU upgrades versus new systems can offer tax advantages of particular value to small businesses. If you spend under \$10,000 in a year, you can call it an operating expense and deduct all your costs in the same year you made the purchase. Anything over \$10,000 must go on your capital budget depreciated over five years. While the choice will depend on your company's buying

habits and income, the former is often preferable since it's better to deduct a lump sum now instead of a few dollars every year.

Finally, upgrading an old system can avoid the hidden administrative costs of installing a new system. "From an administrative standpoint, it's better not to have to deal with swapping PCs, worrying about copying files, and so on," says Kevin Caine, manager of end user computers for Progressive Insurance Corporation in Cleveland.

"What if the new machine has a different physical layout?" asks Horwich. "Maybe it won't fit on the desk in the same way, or it introduces new ergonomic issues, or suddenly you have to worry about purchasing longer cables. These are subtle issues, but they can cost the micro manager time." With a simple CPU upgrade, you keep the same box and avoid this overhead entirely.

Roaming the Hardware Food Chain

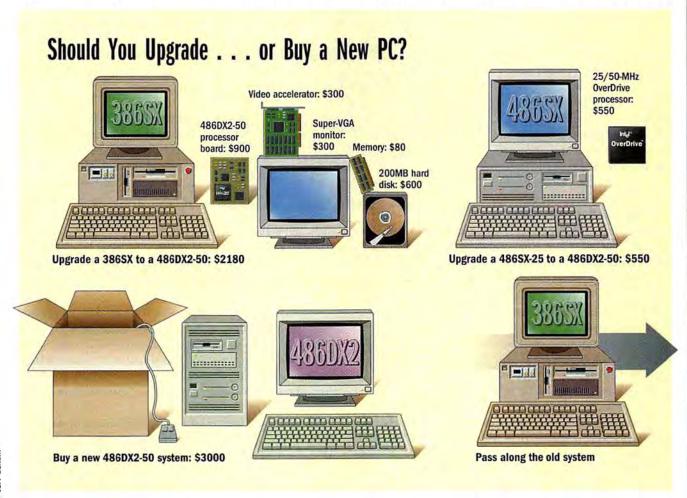
Costs aside, most of the managers we talked to preferred buying new hardware to upgrading outdated systems, for an obvious reason: Two PCs—the new one plus the old one—are better than one upgraded system. In many companies (especially the fast-growing ones), older systems land on the desks of new employees or on those of workers at the bottom of the hardware food chain. In theory, the hot new 486 goes to whoever needs the most power, while that user's old 386 migrates down the line, until the employee who's been using a typewriter gets the 286.

"You can imagine it being like musical chairs, but it really doesn't happen that way," explains Rob Brown, systems development manager for Texas Instruments' Versailles, Kentucky, office. "Usually the PCs don't trickle down very far. The new machine will go to a power user, and the power user's machine will be passed on to a new employee or to one who has not been using a PC."

For the food chain to work, you need a continual influx of hard-ware—a common state of affairs in large companies. "I've got 450 PCs, and upgradables are of no value to me," says Kurt Christoff, manager of decision support systems at Smith & Nephew Richards, a surgical implant manufacturer in Memphis. "Where the upgradables may be of value is at a company that has 10 to 25 PCs or so—the food chain is smaller."

Not all managers believe CPU upgrades and new systems are mutually exclusive. Gary Reigle, who oversees PC purchases at a large Pennsylvania food supply firm, has instituted an ingenious method of integrating the two. Though he generally buys new computers rather than upgrading old ones, he bought several CPU-upgradable PC Brand 386s for his company, partly because of their modular processor cards. "When a user needs to upgrade from a 386 to a 486, we usually buy a new 486 the way we want it," says Reigle. "Then we swap the processor board in the old 386 with the one in the new 486 computer. It saves us time because we don't have to configure a new computer for the person who originally needed the upgrade. And we pass the 386 system down to someone who needs one. If there ever came a time when we didn't need new computers, we could just buy new processor cards."

When everyone who needs a PC has one, you've reached "PC



saturation." However, saturation doesn't necessarily mean the food chain stops churning—the bottom end just extends beyond the last employee. The least powerful systems "can be used as print servers and communications servers, although there are only so many of those that you need," admits Glen Jurmann, section manager for office technology at Baxter Healthcare in Deerfield, Illinois. "We let employees take them home, and that worked for a while, but now that they run Windows at work, they're finding it less useful to have a PC that can't run Windows at home," he says. "We've gotten to the point where we're donating them to charitable organizations."

When an organization reaches this level of saturation, adding

CPU upgradables to the mix, as Jurmann is doing, can keep the food chain from driving too many systems to Goodwill too soon. At Ancora Hospital in Hammonton, New Jersey, a facility with over 60 PCs, employees routinely pass systems down the line. But Human Resources Manager Alan Bilder, who has "a great deal of input" regarding hardware purchases, feels that upgrading systems will "delay the process" and help keep expenditures under control. The CPU upgrade he performed on his own system "gives me at least two, possibly three more years before I have to pass it on to someone else and get a new one."

The Die-Hard Upgraders

Among the people we spoke with, one group stood out as more committed to upgrades than any other: IBM PS/2 purchasers. When asked why he leans toward CPU upgrades rather than buying new machines, Steve Bernstein, consultant to the marketing systems group at San Diego Gas and Electric, offers a frank response. "We've already sunk costs into our PS/2s, and we're

committed to the architecture. We're stuck with our PS/2s—we've got over 100 in our department. It isn't cost-effective to toss them out."

Bernstein bought 20 MicroMaster upgrade boards from AOX, a company that specializes in PS/2 speedup cards. The Micro Channel bus enables the AOX board's processor to take over as the new host CPU without forcing the installer to pull the original CPU, connect ribbon cables, or do other tricks commonly associated with third-party upgrade products. The MicroMaster board "exceeded all our expectations," says Bernstein. "It installed in under 10 minutes." Since Bernstein upgraded the hard drives earlier, "all we needed was the extra speed" of the AOX boards.

Kingston Technology Corporation, a company that claims to do \$1.2 million a month in speedup boards, sells primarily to corporate customers who've purchased IBM or Compaq systems. According to Kingston's director of marketing Ron Seide, "because the initial investment on these machines was higher, there's more of a need to protect the investment."

Maurice Canada, senior technical analyst at a nationwide communications network, has seen *Windows* applications take their toll on his aging assortment of PS/2 Model 50s, 60s, and older 70s. With user complaints on the rise, Canada turned to Sigma Data, another supplier of PS/2 speedup boards. Sigma set him up with several different processor cards that transformed his 286 systems into 33-MHz 386SX machines. "Installation takes about 15 minutes, and the performance improvement is significant," he says. Canada has also equipped these upgraded systems with fast video boards and math coprocessors. With quantity discounts, the upgrade cost worked out to under \$1000 per machine—far less than comparably performing new PS/2s.

Tom Martin, director of computer services at Lithonia Lighting in Conyers, Georgia, agrees with this approach—so much so that he has upgraded nearly 300 286-based PS/2 Model 50 systems with 25-MHz 386 processor cards from AOX. He's also upgraded several 386 PS/2s using 33-MHz 486 boards.

Not all PS/2 upgrade stories have a happy ending. At Swiss Bank's New York offices, Assistant Director Robert Seiboth upgraded more than 40 PS/2 Model 55s with AOX MicroMasters. "We thought we were going to save more money than we did," says Seiboth. "It turns out that prices on equivalent hardware dropped faster than expected, and we could have replaced all those machines for the same amount."

"We've already sunk costs into our PS/2s, and we're committed to the architecture. We're stuck with our PS/2s—we've got over 100 in our department. It isn't cost-effective to toss them out." —STEVE BERNSTEIN, SAN DIEGO

GAS AND ELECTRIC MARKETING CONSULTANT

More for Less: OverDrives

There's an obvious moral to all these stories: The more you have to spend to get decent performance, the less sense it makes to beef up an old machine. When asked if CPU upgrades are worth it, Michael Slater,

editor and publisher of the respected industry newsletter *Micro-processor Report*, judiciously replies: "It depends on what the upgrades cost. If they're \$1000 to \$1500, it's hard to make sense of it. At \$500 it starts to get interesting. And at \$200 to \$300 it can be quite compelling."

Prices may not be that attractive yet, but today's chip-level upgrades are definitely headed in the lowball direction. For about \$550 on the street, you can upgrade a 25-MHz 486SX with a 25/50-MHz Intel OverDrive processor and get a 30 to 70 percent boost in performance. "Chip upgrades are the only sort of CPU upgrades that will really make sense," says Slater. "They'll have the lowest cost and be the easiest to do."

Kimball Brown, International Data Corporation director of PC hardware research, notes that OverDrive-type upgrade chips, which are also known as clock doublers, will soon be supplied by more than just one vendor. "Price competition will make clock doublers really cheap," says Brown. "There are other manufactur-

ers involved besides Intel. AMD, Cyrix, IBM, Texas Instruments—soon they'll all have clock doublers."

People who've upgraded using OverDrive chips are hard to find, because the chips have been available for only a year. But those we managed to contact seem pleased with the results. Tony Butrum, president of Advanced Computer Graphies, is a veteran of upgrade wars. "We tried new motherboards, add-in boards—we've done them all," says Butrum. "I can't see those making sense today, but the OverDrive chip is a really good way to add performance at a reduced cost. And it's easy, too."

Intel is committed to providing OverDrive solutions ad infinitum. The company's next-generation Pentium chip will deliver at least double the power of today's fastest 486. Already, 486 systems are appearing with special sockets for an OverDrive version of Pentium. This version will enable users to upgrade to performance somewhere between their current 486 and full Pentium power.

All Dressed Up for Future Software

It's possible that these high-powered chip upgrades will leave us where we started—with partially upgraded systems suffering from outdated drives and slow video. Slater believes, however, that new systems using *local bus* technology will help keep peripheral performance on a par with processing punch. Instead of relegating peripherals to the slow, 8-MHz bus found in most of today's systems, local-bus systems let you plug high-performance video controllers and other peripherals into a bus that runs at the same speed as the processor. "For example," explains Slater, "with local-bus graphics you get immediate graphics performance improvement every time you increase the processor speed."

Slater may be right, but many users doubt that anything will stave off obsolescence for long. "The way software is going, doubling performance is good for a year to a year and a half of extra life," observes Genelabs' Bruce Hallberg. "By then, what we'll really need is a machine that's ten times faster."

Such skepticism undoubtedly originated with the momentous shift from character-based apps to Windows apps, when demand for disk space, memory, and faster video went through the roof. Arguably, this kind of earthshaking change is unlikely to be repeated soon—for example, Microsoft promises that Windows NT will run at roughly the same speed that Windows 3.1 does. But those of us who've seen our systems slow to a crawl running Windows for Workgroups know that performance hits can come from unexpected places. If multimedia ever takes off, sound and video files will send mass storage and memory requirements spiraling out of sight again.

No one can predict what sort of software ordeals may be in store. For those who need to bulk up their hardware but who are forced to live within their means, chip-level upgrades will always be better than the status quo. Those who are on a quest for the eternally youthful PC, however, might as well give up before they start. According to John Alaniz, "As the machine gets older, there's going to be some component failure. Upgradable machines are certainly a convenient way to get more power and speed, but the nature of machines is that they only have a certain number of miles. A used car that's fixed is still a used car."

Eric Knorr is editor of PC World. Monika Khushf is a freelance writer and consultant living in Menlo Park, California.

Top Ten Things to Do With a 286

Most everyone agrees that trying to upgrade an AT-class system is not worth the trouble or money. So what do you do with your old 286 when its replacement shows up?

- Use it as a Word processor. There may be someone in your company who still hasn't retired his or her typewriter. An AT-class system will work fine, provided you use WordPerfect for DOS or some other character-based word processor.
- 2. Donate it. Schools and other institutions will be more than happy to take it off your hands. And your tax deduction may be worth more than what you could get in cash.
- 3. Keep it for a backup. If your new system should die unexpectedly, you can still get some work done. Consider investing in one of the Ginsu-like integrated packages, such as Microsoft Works, Lotus Works, Lotus Symphony, and others. These run well on ATs and deliver a lot of functionality for the buck.
- 4. Raffle it off to employees. Turn a boat anchor into a perk. Even if your employees don't use them, their kids will. Such systems are fine for churning out term papers and school assignments—not to mention running video games.
- 5. Use it as a print server. A few new network printers let you plug right into the coax cable, but most require a PC to talk to the network. A low-powered system works just fine for this purpose.
- 6. Use it as a communications server. If you have a network, there's little sense in putting a fax-modem in everyone's PC when you can install a few in an AT, purchase some gateway software, and let everyone on the network share the wealth.
- 7. Start a BBS. Get yourself some bulletin board software and install it on your old system. It's a good way to keep in touch with customers, or even provide them with product news and support.
- 8. Set up a voice-mail system. A number of competitively priced boards deliver voice-mail capability for far less than dedicated systems. Just make sure you equip your AT with a 300MB or larger hard disk.
- 9. Set it up as a training station. No, you wouldn't want to train people to use Windows applications on a 286. But for employees new to PCs, having a couple to learn basic skills on—or even run touch-typing tutorials—can bring naive users up to speed before you unleash them on a fully configured system.
- 10. Put it in Storage. If you're the pack rat type, box it up and stick it in a safe place. Who knows? In 10 or 15 years it may be a collector's item and you'll find enthusiasts with pocketfuls of cash at your door. Then again, maybe not.



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Can mere human beings set up a shadow network for their work groups, change their work styles, and avoid infuriating the LAN administrator in the process? Yes, yes, and no.

Windows for Workgroups UPEKAIIUN KOGUE

A network is like plumbing. No one thinks about it until the pipes burst. Take PC World, for example. We run a vanilla Novell NetWare LAN, which we use for E-mail, backup, and printing. We take it for granted. Sure, we curse and stamp our feet when the network crashes, but as users, we don't have the authority to do much about it. Tech Services calls the shots.

Somewhere deep down, I knew it didn't have to be that way. So when Microsoft introduced Windows for Workgroups 3.1essentially Windows 3.1 with peer-to-peer networking built in-I decided to initiate an experiment. Without the help or even knowledge of our curmudgeonly though proficient network administrators, we would set up our own network, make our own rules, and redefine the way we worked. Thus, with visions of democratic file and data sharing, group scheduling, and a networked game of Hearts each

By Steve Fox night at six, the Rogue network was born.

WINDOWS NETWORKS

Operation Rogue

Rogue-the name of our underground network—is a peer-to-peer LAN. Peer-to-peer architecture, as represented by Artisoft's Lantastic, Novell's NetWare Lite, and of course Windows for Workgroups, is a different bird from NetWare, Banyan Vines, and other server-based LANs. In a server-based LAN, dedicated PCs, called servers, store data and applications. The LAN administrator maintains the integrity of the system and assigns access privileges to users. In a peer-to-peer network, every PC can be a server. Information goes directly from one PC to another; any user's computer can act as a data way station and any user can make his or her files or peripherals available to any other user. It's great for sharing data, schedules, and resources like local printers, but beware: Running a Windows for Workgroups peer-to-peer network can also be a nightmare because anyone sharing resources must become a LAN administrator.

My department was resistant to upgrading to Windows for Workgroups at first. Windows is not particularly stable or speedy in the best of circumstances. Add the baggage of a network, they argued, and you're asking for trouble. Plus, we knew we couldn't expect any help from our Novell-happy network administrators. We would be using the same wiring and network cards as our existing NetWare LAN, running both Net-Ware and Windows for Workgroups simultaneously. This sort of activity doesn't win you friends in Tech Services.

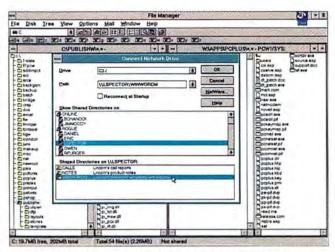
To overcome my department's resistance, I used an old management trick. "I'm the

boss," I explained, "and I'd like you all to give it a try." Most persuasive. Like any good pioneer, I went first. The manual suggests installing Windows for Workgroups directly over Windows 3.1. I had a beta copy that Microsoft assured me was identical to the eventual shipping product, but I was suspicious. So I ignored Microsoft's sound advice and

installed Windows for Workgroups in a separate directory. Lesson number one: Don't do this. Even after loading Windows for Workgroups, you'll be using the same applications you always have, and those apps will be looking to your old Windows 3.1 directory for many instructions. If you put Windows for Workgroups in a new directory, your existing applications will still be trying to draw information from the Windows 3.1 directory—with nasty results. Install Windows for Workgroups over Windows, and all your groups, windows, and references to programs remain untrammeled.

The Conspiracy Grows

A day or so later, I had sufficiently untangled my system from the directory morass and had everything up and running. But a



TO CONNECT TO A SHARED DIRECTORY, click a button in File Manager's new icon bar and choose the user and directory. Windows for Workgroups will map that directory to the next available drive.

network isn't a network unless it has at least two users. Assistant Editor Christina Wood was victim number two. She backed up her files and bravely overwrote her old *Windows* files with *Windows for Workgroups*.

It didn't work. She could load Windows but couldn't send or receive mail, Chat (real-time conversation, akin to an on-line BBS), or share files. Hours on the phone with Microsoft technical support finally uncovered the answer. During installation, Windows for Workgroups identifies your network card and other hardware-specific information, asks you to confirm its findings, and then sets itself up accordingly. But sitting somewhere on our NetWare server was an errantly placed file (IPX.COM), misidentifying the card. The file shouldn't have been there, but Windows for Workgroups found it,

Windows for Workgroups From Both Sides of the Fence



Why We Love It

- Very little training required for Windows users; it is Windows 3.1
- Point-and-click access to directories and files on other people's machines
- Chat function is great when you're on the phone and need to communicate with co-workers
- Easy access to applications, fonts, and graphics on others' machines without sacrificing hard disk space on your own PC
- Schedule+ lets you view each other's calendars, set up meetings, and invite appropriate group members
- When the Novell network is down, you can continue to communicate and can print on a group member's local printer



Why We Hate It

- Sluggish performance on machines without heavy hardware or more than 4MB of RAM
- The more shared directories you hook into, the longer Windows takes to load and exit
- Though a \$79.95 add-in, Workgroup Connection, allows DOS machines to send and receive mail and view others' files, you must be in Windows or a Windows application to take full advantage of Windows for Workgroups' features
- Added administrative functions: You must establish file and calendar access levels and hook up to network drives on your own
- . Incompatibilities with some existing software
- Setup is balky, especially in conjunction with other networks

ran it instead of her PC's local IPX.COM, and reported the misinformation. Lesson number two: Know your network card, its IRQ, and its I/O base address.

Suddenly our network was working. In File Manager, I clicked the Share button to grant read-only access to my Rolodex files, and several hours later Christina browsed the files to find a contact name she needed. After work we played our first game of Hearts, with the network playing two of the four hands. Several co-workers watched, oohing and aahing. Life was good.

Feeling cocky, we recruited Jim Moody and Bundy Chanock, who run PC World's Online Services department. They tripped over another problem. Windows for Workgroups inserts the command "LAST-DRIVE=P" into your CONFIG.SYS file, but our Novell log-in drive had always been F:. According to the logic of networks, if you have a LASTDRIVE=P statement, the network expects to map itself to Q:, the drive following "last drive." So NetWare, seeking the F: drive, was unable to recognize their renegade machines. Even when

they were able to log on to Net-Ware manually before loading Windows for Workgroups, none of their batch files calling on the network backup tape drive or modem worked. This led to lesson number three: Change all

network drive references in AUTOEXEC-BAT and any other batch or PIF files to Q:.

Getting Down to Work

With four of us aboard, we started having some real fun—and getting work done. Along with being a great gossip tool, Chat, it turns out, is an excellent way to communicate while you're talking on the phone. On our second fully operational day, someone called to propose a meeting. While still on the phone, I opened up Christina's calendar, ascertained that she was available at the requested time, and called her via Chat to ask if she were interested in attending. She was, so I told the guy on the phone that we were amenable, and then booked the meeting in Christina's and in my calendar. Elapsed time: 60 seconds.

Shortly thereafter, new Rogue convert Lincoln Spector realized he could access and use any of the typefaces from the TrueType font motherlode on my machine even if he didn't have them on his own PC.

It was a licensing quagmire, we both agreed, but it sure made for some great-looking documents. And best of all, those original documents didn't have to be on a local machine. By clicking the Share icon in File Manager and choosing Read Only or Full access, work group members were making and entire applications available to other Rogues.

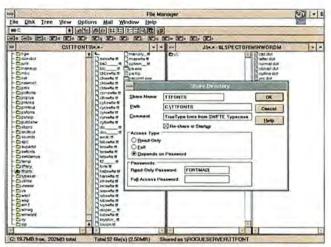
We were euphoric the first time Bundy Chanock came bounding into my office to announce that Jim Moody, from his own PC, had browsed Bundy's shared directories and double-clicked on Bundy's *Q&A* executable file to load *Q&A*. Then Jim called up a database and added a record. Visions of

Visions of security nightmares and malcontent employees deleting mammoth files fluttered across my consciousness.

security nightmares and malcontent employees deleting mammoth files fluttered faintly across my consciousness, but these images were quickly displaced by the promise of a kinder, gentler work paradigm—and by a firm resolve to set my open directories to read-only status.

Word spread, and soon we had about a dozen Rogues on line. We also had a disgruntled Tech Services department, which had gotten wind of our merry band. We eventually called a truce after I explained that I was writing a story on our experiences, but our LAN administrator was not exactly happy with our roguish peer-to-peer sitting atop their pristine LAN.

To a certain extent, I understand their trepidation. Microsoft has billed Windows for Workgroups as plug-and-play, and after you've gained some experience and know what to look for in AUTOEXEC.BAT, CONFIG.SYS, and a few other places, that's a fair description. By user six or so, I was getting people up and running in about



TO SHARE A DIRECTORY, select it, click the Share button, and fill in the appropriate information in the resulting dialog box. Shared directories are represented by an icon of a hand holding a folder.

the time it took them to install the required eight disks. Until you've gained that familiarity, however, the process may be better described as plug-and-pray. We had some nasty difficulties configuring network drives, for instance. And users elsewhere have reported problems installing Windows for Workgroups alongside certain NetWare drivers or on top of LANs that employ communications protocols like TCP/IP.

Day-to-day troubleshooting is no pienic, either. The mail program suddenly told several of us that our passwords were incorrect. The only remedy seemed to be deleting our MSMAIL.INI files, starting Mail, and choosing passwords anew. When a funky font corrupted my Chat module and yielded the ominous 'Divide Overflow Error', I struggled for an hour before calling Microsoft tech support. They had me delete the CHAT.INI file and restart Chat, by which time I had intuited lesson number four: When an application fails, exit it, then delete its INI file (don't try this with WIN.INI or SYSTEM.INI). A clean INI file will regenerate itself when you restart the application.

A few days later, when trying to access Chat one more time, I received the message that I had exceeded the "NetBIOS session limit" for my protocol. In English, that meant I couldn't talk to anyone over Chat. I scratched my head, rebooted, and everything turned out okay. Contributing Editor Daniel Tynan has been plagued by crashes and the dreaded 'General Protection Fault in WINFILE.EXE 0006;1405' message when dragging files in File Manager from drive E: to B:. And Editor Eric

WINDOWS NETWORKS

Knorr turned on his PC one morning and found that File Manager wouldn't show listings of files. The only thing that helped was—you guessed it—deleting WINFILE-.INI and restarting File Manager.

Along with technical glitches, we encountered a host of organizational problems. It started with names: This was a rogue network, so everyone picked a user name she or he liked. We had Phred, Mother, XTina, and other equally cryptic designations. At setup, Windows for Workgroups also asks for a computer name. Again, the choice was bewildering, with computer designations like ZPatch, Bunny, and Everex25.

Chaos mounted as people began forming their own mini-work groups and trying to set up their own mail systems. When trying to hook up to a shared directory, one has to remember the name that people assigned to their computers. Even hooking up to *Mail* was confusing, because to use mail, users must have access to a shared directory on the mail server's machine (the mail server manages the work group's post office). Giv-

en our eclectic naming conventions, people tended to forget which PC was the mail server. Within a few days, people forgot which were their user names and which were their computer names, as even the most re-

sponsible users began asking questions like, "Am I Jim Moody, JMoody, or JimMoody?"

I decided to take control. In a move that had the Rogues yelling "MIS," I mandated a series of naming conventions. Everyone's computer would be called by the user's first initial plus last name, except for the mail server, which would be designated as Rogue Server. User names would have to be comprehensible. Within a day everyone had changed names and peace was restored. That day, though, was a never-ending procession of error messages, since our computers were mapped to share certain directories, some of which were on PCs that Windows for Workgroups no longer recognized.

A second edict met with greater approval. I requested that Rogues not use Windows for Workgroups' built-in Microsoft Mail package. Since we're still on NetWare and are quite happy with our existing network mail package, cc:Mail, there seemed little point in using both. Checking two mail systems for messages is a huge hassle, and besides, with Microsoft Mail, we can talk

only to one another, and cc:Mail gives us access to our entire company, plus fax machines. MCI. and other services through gateways. Microsoft has promised to supply a \$995 MHS gateway, which, with a \$495 extension kit, will allow Mail to link into cc:Mail. Unfortunately, Windows for Workgroups, as it ships out of the box, does not support

multiple post offices. Each work group has its own post office, but different work groups can't send mail to each other. One solution is to have just one post office, with all the users on it. But that can get unwieldy. My system, with 12 users, is getting a lot of traffic. Fortunately, Microsoft's

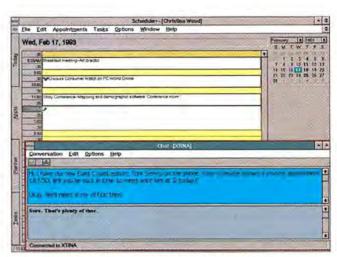
We soon had a working network—and a disgruntled Tech Services department, which had gotten wind of our merry band.

extension kit will allow two post offices to connect.

Schedule+ also hooks into Microsoft Mail, but you can send and receive meeting invitations and confirmations without opening Mail. We're still getting our sea legs with the scheduler, but it should solve some of our knotty meeting problems—assuming that we can get all our users on it.

Was It Worth It?

The verdict on Rogue itself, for the time being, is a guarded thumbs-up. The ease with which we can share files within the work groups is the biggest win so far. The group clipboard, called the Clipbook, looks to be a real help as well. It's an easy way to store images and text blocks. Because we spend a lot of time testing tips within different applications, we also stand to benefit from sharing applications—remotely running a program located on a co-worker's PC. Not surprisingly, Microsoft's Word for Windows and Excel work flawlessly over the network: You double-click to load the other



CHAT ALLOWS REAL-TIME CONVERSATION. The icon on the left initiates a call, the middle one answers, and the right button hangs up.

person's program, complete with his or her styles and personalized icons, but you keep your fonts. Other applications, like AmiPro, load fine from another machine, but you don't have seamless access to style sheets and templates, while WordPerfect for Windows failed to run across the network at all.

Performance, too, has been spotty. While my 486 DX2-50 with 8MB of RAM zips right along, Windows has been extremely sluggish for anyone with just 4MB. Except for Dan Tynan, few of us have suffered an unusual number of system crashes, though we've found a quick way to trigger them. If I exit Windows, anyone trying to access Microsoft Mail or Schedule+, both of which reside on my PC, will get an error message. In extreme cases, their computers freeze up, requiring a reboot. And even if their systems don't crash, they have no access to their schedules. The solution is simple: I don't exit Windows for Workgroups when anyone else is connected to me. Of course, when I install a new application or change my Windows settings, I need to restart Windows before my changes take effect. For the time being, I'm doing a lot of weekend and after-hours configuration and installationsand keeping my computer on 24 hours a

day. But then again, plumbers work long hours, too.

Steve Fox is a senior editor for PC World. He can be reached on PC World Online (see page 8 for more information).

WHERE TO BUY

Windows for Workgroups

\$249.95, upgrade from Windows 3.1 \$99.95 Microsoft Corp. 800/426-9400

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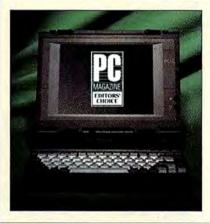
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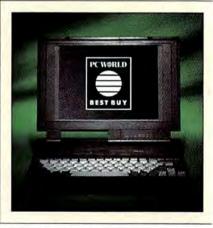
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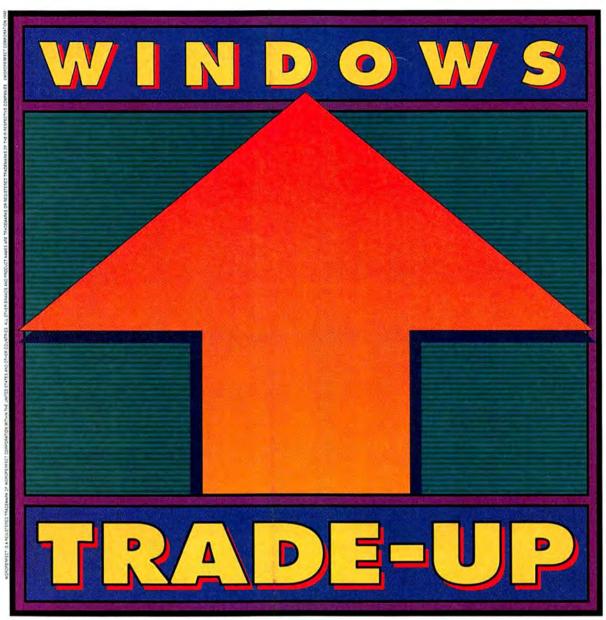
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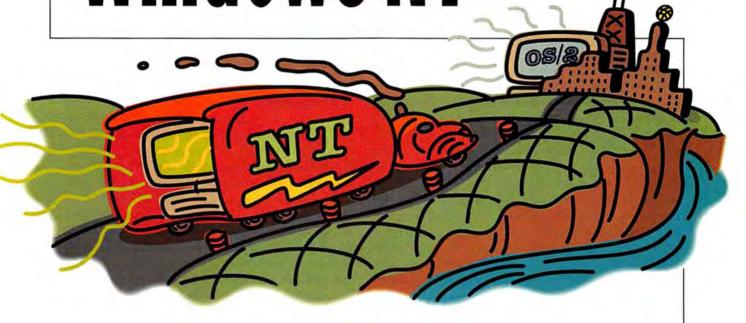
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OS/2 VERSUS Windows NT



or the last few years we've been hearing how the next generation of operating systems would unlock the power of our 386 and 486 systems. Thirty-two-bit memory and file operations will mean better performance. Memory protection and virtual memory will let you run all your apps at once with no problems. Unprecedented capabilities will unleash a torrent of killer apps.

Sounds great, doesn't it? Now at last we can get down to cases: IBM's OS/2 2.0 has been out for almost a year, and Microsoft's Windows N'T is scheduled for release later this year.

Both OS/2 and NT promise many advantages over DOS and Windows 3.1. Protected-mode multitasking means when one app crashes, it can't bring down other apps or interfere with the operating system. Enhanced file systems liberate us from cryptic DOS file names (Projections, 2nd Quarter 1993 instead of

Will one of these next-generation operating systems find a place on your desktop?

If so, how soon?

PROJ2Q93.DOC) and provide better performance thanks to built-in caching and other tricks. OS/2 (but not NT) also promises an easier-to-use graphical interface that integrates file and program management à la the Mac. NT (but not OS/2) also offers built-in networking, including E-mail, group scheduling, and NetWare-style server capabilities and will run on RISC workstations and multiple-CPU servers.

IBM and Microsoft also promise that these operating systems will vastly improve the performance of your other software—once the applica-

tions are written. Thanks to 32-bit memory, disk, and video operations, new OS/2 and NT apps should be faster than their DOS and *Windows* counterparts. Thanks to multithreading, they'll also be able to do several things simultaneously. For example, you can reply to one E-

mail message while downloading by Robert Lauriston

WINDOWS NT vs. 0S/2

others. Both OS/2 and NT also promise to run most 16-bit DOS and *Windows* apps. Indeed, IBM claims that some DOS apps will run *faster* under OS/2.

Such are the promises. To see how well OS/2 and NT deliver the goods, I installed both and used them for my daily work, doing all my usual tasks (word processing, data management, telecommunications) with my favorite apps. I also hoped to take advantage of some just-released 32-bit apps and perhaps to find better ways of doing common tasks such as backup and disk management.

Several versions of OS/2 were available as I prepared this article. Except where noted, my comments reflect the one that worked best: OS/2 2.0 with the November 1992 Service Pack upgrade. I used the October 1992 beta release of NT.

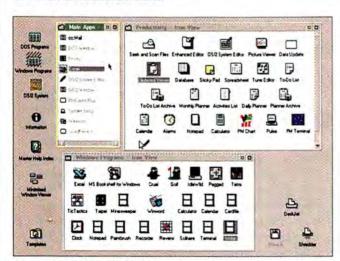
Better Multitasking: But for Whom?

The most ballyhooed benefit of these new operating systems is their improved, reliable multitasking. The advantage is clear: Under DOS-based multitaskers such as Windows 3.1 and Desquiew, an ill-behaved app can crash other programs or even bring down your whole system. Under OS/2 or NT, a badly written application can crash only itself, not other programs.

OS/2's multitasking may be more robust than Windows', but its reliability is seriously compromised by a design flaw: When an app stops responding to the keyboard and mouse, there's no way to kill it except by hitting <Ctrl>-<Alt>-<Delete>—which reboots the whole system. NT's multitasking seemed bulletproof, and dealing with hung apps is easy: <Ctrl>-<Alt>-<Delete> pops up a dialog box from which you can kill any running app.

Some users need this more reliable multitasking. Programmers are a good example; bugs in unfinished software can mean hundreds of crashes and reboots a day. Those who push Windows beyond its limits, say by loading half a dozen DOS apps, are also prime candidates. So is anyone who regularly uses crash-prone software, such as quick-and-dirty custom apps or the problematic communications programs many older mainframes require.

For me, however, reliability isn't a big issue: At least on my system, *Windows 3.1* handles app crashes very well. Though it has crashed on me many times, the problem has always proved to be a bad video or soundboard driver.



OS/2'S FLEXIBLE DESKTOP: You can leave often-used icons on the desktop, or configure folders to create a menu of your favorite apps.

he New OS's	1220	Windows HT
lvanced features		3
Protected multitasking	~	~
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Maximum RAM (GB)	4	4
Maximum disk storage (GB)	1536	17 billion
Built-in networking and E-mail		1
Security and auditing		~
Fault tolerance	L. 100	~
Runs on various CPUs		~
Enhanced command line	-	1
Enhanced batch programming	~	
mpatibility		
Runs most DOS apps	1	~
Runs most real-mode Windows apps	~	
Runs most standard-mode Windows apps	1	1
Runs 386 enhanced-mode Windows apps	~	
Customizes CONFIG.SYS and AUTOEXEC.BAT for each DOS/Windows app	-	

Performance Promises

Theoretically, 32-bit apps running under OS/2 or NT should be faster than the equivalent 16-bit apps running under Windows. Unfortunately, I couldn't find 32-bit equivalents for any of my day-to-day apps. Of the few mainstream 32-bit OS/2 and NT applications that have been announced (see "Where Are All the Apps?"), only two OS/2 apps were available, CorelDraw 2.5 and DeScribe Word Processor 4.0 SE. CorelDraw felt a bit slower than the Windows version, but it's also a rev behind. (The Windows version's already up to 3.0.) DeScribe was sluggish compared with Word for Windows.

I found that my *Windows* apps ran much slower under OS/2 than under *Windows 3.1*, while DOS-app performance was erratic. Multitasking was problematic: Downloading files or performing other tasks in the background often slowed foreground apps to an unusable crawl. It won't be possible to judge NT's performance until it ships. But since Microsoft's stated goal is for NT to run DOS and 16-bit *Windows* apps no more than 10 percent slower than *Windows*, any performance benefits will clearly be limited to 32-bit NT apps.

Compatibility Compromises

The decisive obstacle to my using either OS/2 or NT is their incompatibility with my current software and hardware. Though both systems run DOS and Windows apps, neither runs everything I use. With both systems I had to reboot to DOS whenever I needed to run America Online, Faxit, or FileMaker Pro. Neither OS/2 nor NT would run either the DOS or Windows version of Central Point Backup. Nor was any OS/2 or NT backup utility available that would work with my Colorado Memory Systems Jumbo 120 (one of the most popular tape drives around). Though NT has tape backup built in, so far it works only with a few expensive SCSI drives.

OS/2 provides drivers for most video boards and peripherals that ship with IBM systems but so far not for much other equipment. I couldn't use my Pro Audio Spectrum 16 soundboard under OS/2, and the modem portion of my SatisFaxtion fax-modem worked only with DOS and *Windows* apps, not with OS/2 apps. Neither

IBM nor third-party OS/2 communications program vendors could resolve the latter problem, and when I called Intel for support the tech said flatly, "We don't support OS/2." Ouch.

In its first beta release, NT already includes support for more third-party hardware than OS/2. NT works with a wide variety of popular CD ROM drives and super-VGA boards, including mine, and it even worked with my Pro Audio Spectrum 16 soundboard (though only in its less-than-optimal Sound Blaster compatibility mode). My modem worked fine with NT's Terminal comm utility.

OS/2 2.0 had major software-compatibility problems on my system. While it was able to run most of my apps, I was plagued by random and bizarre events. A WordPerfect document I was editing suddenly decided it was read-only, and I had to save it under a new name. Excel once crashed when I entered an innocuous Format•Font command; the next time it worked fine. Even the two 32-bit OS/2 apps I found had trouble: Once I had to reboot before I could cut and paste from CorelDraw into DeScribe, and the two programs tended to crash when running at the same time. Even without apps, OS/2 was flaky: For example, windows often opened behind other windows instead of on top (though I spoke with many OS/2 users who reported no trouble running the same software).

As you might expect, NT had little trouble running Windows apps, even (with some fiddling) multimedia CD ROMs like Book-

Windows NT copies the tried-and-true Windows 3.1 interface almost exactly, while IBM has given OS/2 2.0 a new Macintosh-like look.

shelf. NT can't run memory-resident DOS programs like the fax board manager Faxit requires, and FileMaker's trouble should be fixed in the next beta. Except for one minor problem (which should also be fixed in the next beta), NT ran all the DOS apps I use regularly. I found only two DOS apps that wouldn't run on NT but would run on OS/2: the bare-bones backup utility that came with my CMS Jumbo 120 tape drive, and the equally bare-bones fax software that came with my SatisFaxtion board.

Look and Feel

NT and OS/2 take visibly different approaches to graphical computing. Windows NT copies the tried-and-true Windows 3.1 interface, while IBM has given OS/2 2.0 a new Macintosh-like look.

One of IBM's boasts about OS/2 2.0 is that its Workplace Shell (WPS) uses object-oriented technology to make common tasks easier than they are under *Windows*. For example, instead of opening an app, creating a new file, and saving it to a directory on your hard drive, you drag a "data-file object template" from a "folder object" onto the OS/2 desktop. It's certainly a nice idea to simplify file management. However, in the absence of OS/2 apps written specifically to take advantage of WPS objects, rather than making basic tasks easier, the WPS generally makes them more complicated.

The problem is that even OS/2 2.0 programs are still oriented toward the file-directory model, and it can be difficult or impossible to use the WPS as IBM describes. For example, "template" objects are supposed to make it easier to create documents. I tried creating one for WordPerfect but encountered one problem after another. For example, I needed to add a WordPerfect entry to the WPS's list of known applications. The procedure wasn't in the man-



NT IS A WINDOWS LOOK-ALIKE, though the heads and computers on icons in Program Manager tell you if groups are personal or shared.

uals or on-line docs, and IBM's tech support didn't know how either. I finally found a sharp OS/2 user who gave me his home-brewed command-line utility, which did the trick. But after spending many hours creating my template, I discovered it was useless. OS/2 automatically stored the documents created by my template

in a directory with a long file name, which WordPerfect can't read.

IBM claims the WPS will come into its own with apps designed to work with it. The OS/2 2.0 apps I tested, however, didn't

make any significant use of the WPS. The only concrete examples of WPS tricks IBM cited were printing a document without loading the app and creating a password-protected folder.

The WPS is a passable file and program manager—once you change IBM's bizarre default settings. For instance, directory trees display in reverse alphabetical order, directory and folder windows are a random heap of icons, and occasionally icons end up smack on top of each other. You can change the settings to display in a grid from A to Z, but since there's no global setting control, you have to repeat this process for every directory window. On the bright side, the display is very flexible, so you can arrange your desktop to suit yourself.

In Windows NT, Program Manager, PIF Editor, and the desktop look and work almost exactly as in Windows 3.1. And NT's File Manager offers point-and-click access to network drives, while Print Manager sports icons for sharing files and connecting to directories on the network—features found in Windows for Workgroups. The Control Panel has a slightly different set of icons, including some extra tools for network tasks. Though I'm disappointed that Microsoft didn't combine the Program Manager and File Manager into a single, more elegant utility, NT's lack of innovation does make for an easy switch for experienced Windows users.

Hands On

OS/2 and Windows NT could be more mouse friendly. But to their credit, both make associating file extensions with programs easy, so you can open documents by double-clicking on their icons. Both also let you drag and drop icons to perform a few other basic functions, but they're not very consistent about it.

In NT (as in Windows) you can drag one or more icons from the

WINDOWS NT vs. OS/2

File Manager into an application's work space, or drag one icon at a time onto the Print Manager-provided the Windows app in question supports drag-and-drop. You can easily add any program or document to the Program Manager by dragging its icon from the File Manager.

When you're mousing around OS/2, you can delete just about any object by dragging its icon onto the Shredder icon (IBM's answer to the Mac's trash can). You can print plain text files by dropping their icons on a printer icon, but other kinds of documents must be open to print them. When you drag one icon onto another in other circumstances, the results vary. For example, dropping a data file icon into DeScribe's open window opened the file; dropping it onto the DeScribe icon in the directory display or on the desktop opened the file, but in a new, separate session of the app; and dropping it on the DeScribe icon in the Minimized Window Viewer did nothing. Other OS/2 apps displayed different sets of responses—an inconsistency that compromises the ease of use drag-and-drop is supposed to offer.

NT is the champ if you prefer the keyboard to the mouse. Just as in Windows, every menu and dialog box clearly displays the keyboard commands, you can define shortcut key combinations in Program Manager for starting and switching between apps, and you can quickly switch between two apps with <Alt>-< Tab>.

You can use OS/2 without a mouse, but you'll need to keep a cheat sheet handy for some of the undocumented commands. There are no shortcut keys, so switching between apps always means a detour through OS/2's Window List menu.

Networking and Portability

Every copy of NT contains full workstation and server capabilities: All you add are network boards and cables. NT capabilities that are particularly useful on servers include "spanning" physical disks to create a huge logical volume, rebuilding crashed disks from a transaction log, and shutting down when your uninterruptible power supply signals a power failure. NT also has the same E-mail and group-scheduling tools bundled with Windows for Workgroups, so you can mix and match the two operating systems on your network.

With OS/2, networking is an add-on. IBM currently supports both



NT ALLOWS YOU TO SET DIFFERENT ACCESS LEVELS to directories and files on your NT workstation from the File Permissions box.

its own LAN Server and Novell's NetWare, as well as a wide variety of IBM minicomputer and mainframe links.

Which Way Is Up?

Unless you're a programmer, need to multitask an inordinate number of applications, or have other special needs, currently you're better off not taking the 32-bit plunge. Neither OS/2 nor NT have much to offer the average user, nor will they until a wide selection of 32-bit apps is written to take advantage of their capabilities.

As for the future, in some ways, OS/2 and NT aren't competing at all. On the one hand, large corporations with a heavy investment in IBM hardware like the way OS/2 runs their DOS-based micro-tomainframe software and custom apps, most of which would have to be rewritten to run over NT. On the other hand, many people looking at NT see it as a Windows-compatible alternative to UNIX.

To make matters more confusing, OS/2 and NT are just two racers in an ever-widening field. NeXT expects to release its UNIX-based NeXTStep 486 at about the same time as NT. If NeXTStep offers comparable DOS and Windows compatibility, it will be a strong rival to

NT among UNIX fans. Sun is reportedly working on a 486 version of its Solaris operating system that runs not only DOS, Windows, and UNIX programs but Mac apps as well. And as if that weren't enough, Microsoft says it's working on 32bit versions of DOS and Windows that will offer many of NT's benefits but with better DOS compatibility and slimmer hardware requirements.

So which way is up? If and when OS/2, NT, or one of the other contenders has a suite of apps that will handle all my needs, I'm ready to upgrade. In the meantime, I'm sticking with the only environment I've found that runs all the software I use: Windows 3.1.

Robert Lauriston is a contributing editor for PC World.

Where Are All the Apps?

Both IBM and Microsoft have lists of hundreds of applications released or announced for their next-generation environments. Few of these are the kind of apps you find on the shelves of your local software store. They're languages, database servers, and other programmers' tools, or niche-market apps one step up from custom software, sold, installed, and serviced by the developers. Here are a few mainstream exceptions announced as we go to press:

05/22.0

1-2-3 for OS/2 2.0, Lotus Development Corp. cc:Mail, Lotus Development Corp.

CorelDraw, Corel DeScribe (word processor), DeScribe, Inc. Freelance Graphics, Lotus Development Corp. Micrografx Draw for OS/2, Micrografx WordPerfect 6.0, WordPerfect Corp.

Windows NT

AutoCAD, Autodesk

Ami Pro for OS/2 2.0, Lotus Development Corp. Fractal Design Painter (graphics), Fractal Design Corp. FrameMaker (desktop publishing), Frame Technology Corp. Harvard Graphics for Windows, Software Publishing Corp. HyperAccess NT (communications), Hilgraeve, Inc. MicroPhone Pro (communications), Software Ventures Microsoft Excel, Microsoft Corp. Microsoft Word, Microsoft Corp.

Now, other word processors have something they never had before.

Features	Ami Pro 3.0	Word for Windows 2.0b	WordPerfect for Windows 5.
True WYSIWYG in all views eliminates guesswork	Yes	No	No
Fast Format – quick repetition of text formats	Yes	No	No
SmartMerge step-by-step mail merge guide with a card file data manager	Yes	No	No
Preview of professionally-designed Style Sheets for memos, faxes, letters, newsletters, etc.	Yes	No	No
WYSIWYG preview in File Open to quickly view, print, or extract text	Yes	No	No
Number of import/export filters (word processing, database, spreadsheet, graphics)	45	27	36
Grammar Checker	Yes	Yes	No
On-line Tutorial	Yes	Yes	No
Automatic re-numbering of lists	Yes	No	No
Colorful, customizable, editable, sizable Smartlcons™ for one click access to your most frequently used tasks	Yes	No	No
In-context editing of drawings and charts	Yes	No	No
Laptop Install option for quick and minimal configuration on a laptop	Yes	No	No
Clean Screen option for total workspace customization	Yes	Yes	No

Competition.

Take a look at this chart and you'll see, feature-by-feature, just how far Ami Pro 3.0 has leaped ahead of other Windows word processors. Which, not surprisingly, is why it's being hailed as the best word processor for Windows by respected and objective evaluators.

Ami Pro 3.0 takes top honors.

In fact, in recent tests' conducted by the National Software Testing Laboratories, Software Digest" (Vol. 9, No. 6, Sept. '92) gave Ami Pro 3.0 the highest Overall Evaluation in its category.

Their reason: "Lotus Ami Pro 3.0 offers an unbeatable combination of peerless usability, top-level features and fastest overall performance."

It also received the highest score ever for a Windows word processor in a recent InfoWorld® review, and won the PC Computing MVP award

for word processing. So it's definitely the word processor to evaluate.

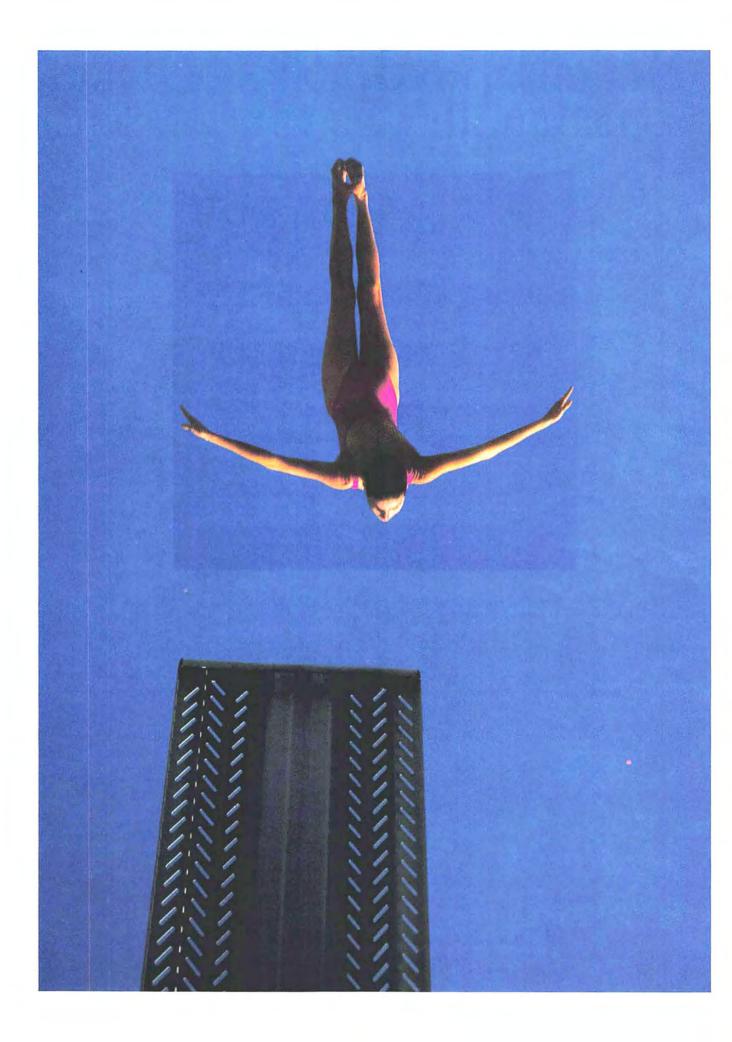
Now that you've seen the evidence, why not prove it to yourself? Call us at



1-800-872-3387, ext. 7330 for your free working model or to upgrade from your current word processor for just \$129.*

Ami Pro 3.0. It's the one word processor for Windows that doesn't just invite comparison. It welcomes it.

Lotus Ami Pro 3.0 Word Processor for Windows



The drive and determination to advance can be seen in many forms. Here's a couple we think you'll be excited about.



Introducing the Microsoft databa management systems. Some people aspire to become famous athletes. Others to become great scholars.

But for a group of

us here at Microsoft, there's nothing more important than creating a new line of databases with the tools and technology you need to do your everyday tasks.

For example, some of you will need dBASE* compatibility and unequaled performance. That's why we have Microsoft* FoxPro* 2.5. Some of you need seamless access to data in multiple formats. For you we have the Microsoft Access** database for Windows."

But all the tools in the world won't do you much good if you can't get help when you need it. So we have a world-class product support organization to quickly answer all of your database questions.

In addition, we've created a special program for developers that will put you directly in touch with some of our senior product support people.

In the future, our technology will con-

tinue to evolve with you in mind. So what you create today will still work tomorrow. In short, there will be no dead ends.

We're also committed to supporting open standards and compatibility. Cur-

rently, we are working with ANSI to develop a standard Xbase language.

Plus we fully support the Open Database Connectivity (ODBC) technology, which will allow you to access files from even more of today's database management systems.

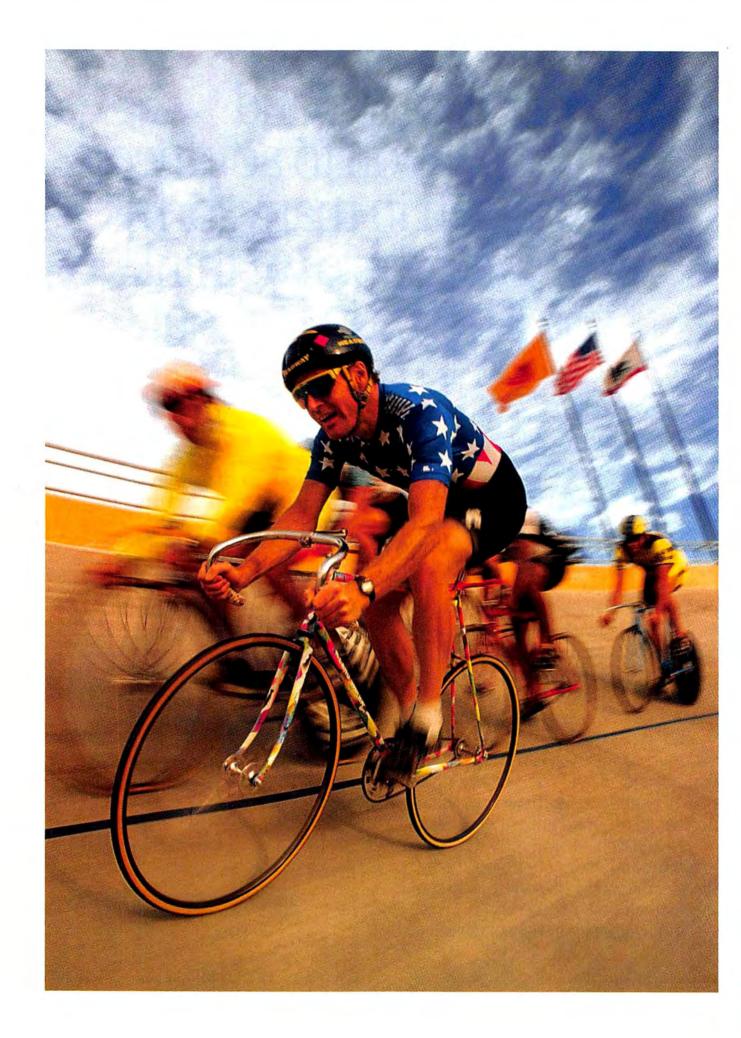


Both Microsoft FoxPro 2.5 and Microsoft Access were created to take complete advantage of the Windows operating system.

And to ensure there will always be a vast supply of industry-specific products and services to meet your database needs, we're forming strong business partnerships with many other companies.

So if you'd like additional information on Microsoft's database solutions, give us a call at (800) 882-2000, Dept. JH2. And find out just how motivated we are to become your database company.





Since the beginning of time, people have been obsessed with reaching ever increasing rates of speed. So what else is new with Microsoft Fox Pro 2.5?



Microsoft FoxPro version 2.5 is the fastest PC database management system available today.

Plenty. For starters, the new Microsoft FoxPro 2.5 for Windows has a rich and productive environment with an intuitive graphical interface. Which means it's never been easier for you to use and de-

velop powerful Xbase applications.

Plus there's a virtual hardware store of tools for both developers and users.

For developers, there are professional tools designed to help you create the most powerful applications possible.

Like the Trace and Debug windows, Project Manager, Menu Builder, Screen

Builder and Report Writer.

For users, there are handy tools that make it easy to do complex database tasks without programming. Like Relational Query By Example (RQBE), which allows you to build and see queries instantly. Or the graphical Browse tool, an intuitive way to view data. And finally, Quick Screen and Quick Report, two easy ways to create objects and see data.

And now with the arrival of FoxPro 2.5

for both the Windows and MS-DOS operating systems (and soon for the Macintosh and UNIX), you can have the most powerful and most graphical Xbase applications across all major PC platforms. And if you are thinking about migrating to Windows

in the future, have no fear. Because Microsoft FoxPro for Windows will easily run all your FoxPro 2.0 files.

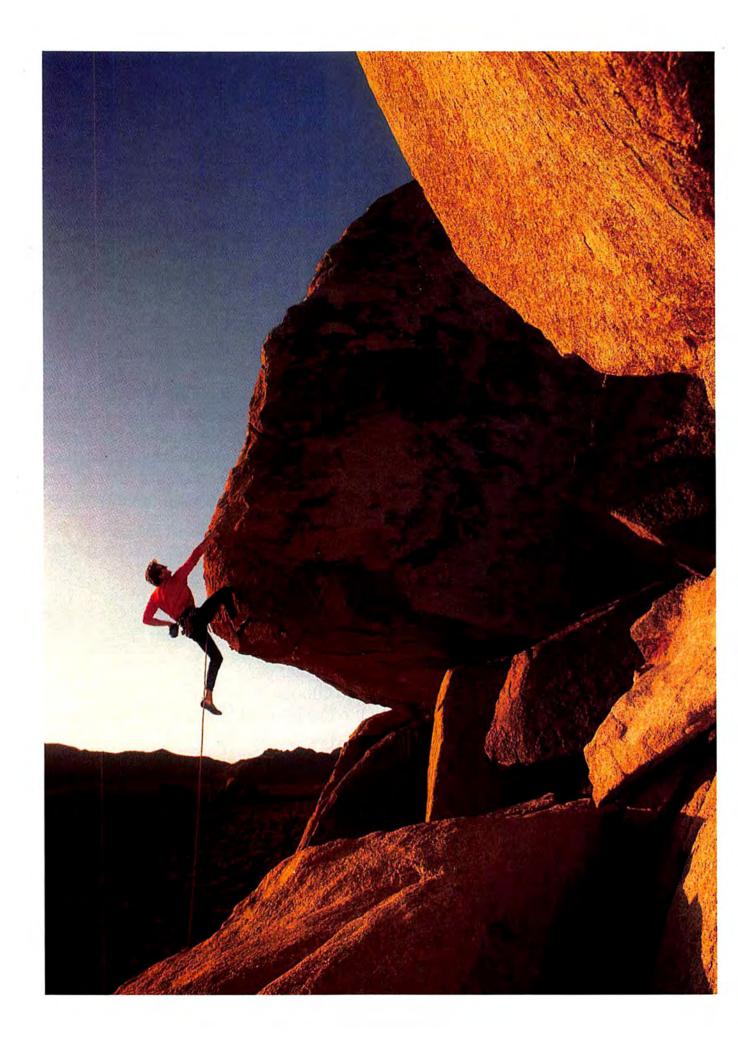


FoxPro 2.5 takes advantage of Windows and allows you to create dazzling applications.

which platform you choose, you can count on Microsoft FoxPro to provide you with the fastest PC-based database management system.

For additional information, just zip on over to your nearest reseller, or call us at (800) 882-2000, Dept. JH3. We'll be more than happy to tell you all the ways Microsoft FoxPro 2.5 for Windows can get your adrenaline pumping.





People always seek the most direct route to achieve their goals. So you've probably been looking for a database like Microsoft Access.



With AccessWizards, you have a guide to walk you through complex tasks, one step at a time. If you're a database user or programmer, we'd like to show you a great shortcut. It's called Microsoft Access." It's a new database management system for Windows" that can give you something no other

database can. Easy access to the powerful features you need to do your job.

To start with, Access takes complete advantage of the Microsoft Windows operating system. Which means it has never been easier to create great-looking forms and reports. Plus you can store objects like pictures, graphs, sound, and video. Right in your database files.

And if you ever get stuck, there are ReportWizards, FormWizards and Chart-Wizards to come to your rescue. They'll ask you questions about format, content and style. Then they'll automatically create your report, form or chart.

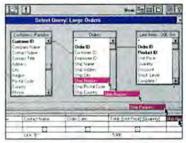
There are also Cue Cards to walk you through the most difficult database tasks. Guiding you one step at a time.

In addition, it's easy to create complex

queries by using the graphical Query By Example. You just drag and drop tables, join fields, and plug in all of the specifics.

And you developers can write sophisticated database applications with Access Basic. A powerful, extensible program-

ming language.
What's more,
Microsoft Access
can easily read
and write all the
major database
formats directly,
including dBASE;



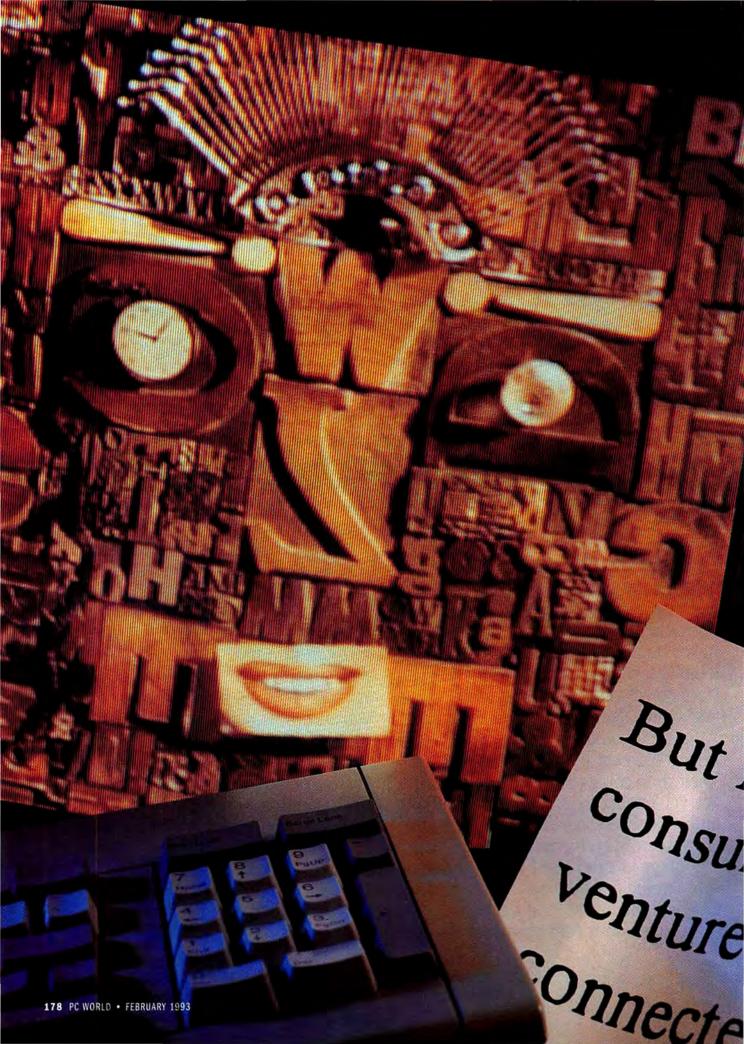
Create complex queries visually with our graphical Query By Example.

Paradox* and Microsoft SQL Server. So you and your coworkers can still use all your old files, no matter what format they are in. That means, your investment is safe and everyone can easily migrate to Microsoft Access at their own pace.

To receive additional information on Microsoft Access, call (800) 882-2000, Dept. JH4. We'll give it to you straight.

Microsoft

Making it easier



75 HOT

Word Processing oday's crop of word processors are, bot

oday's crop of word processors are hot enough to blacken redfish. Contemporary word crunchers like Word for Windows and Ami Pro come with all the ingredients necessary to whip up great looking pages: prefab templates and style sheets, built-in fonts,

TIPO N

graphics, and other desktop publishing-style tools.

While you can spend hours sampling all your word processor's tastiest features, the fact remains that you need to get your work done, and soon. That's why we've gathered 75 tips from contributors, companies, and readers like you for the most powerful and popular programs, from the DOS and Windows versions of WordPerfect and Microsoft Word to Ami Pro and even WordStar.

Do you know the fastest way to format a block of text? What's the easiest way to insert the current date, foreign currency symbols, or big hunks of boilerplate into your documents? The answers to these and other burning questions appear on the following pages. Whether quick keystroke shortcut or handy macro, these tips will make your hours at the keyboard a lot more productive.

As you try out these tricks, take a look at tips for programs you don't use—odds are, your word processor offers a similar feature or command. Then branch out and discover your own personal short-

Edited by George Campbell

cuts. Before long, you'll be cooking up your own recipes for productivity.

Int to

WORD PROCESSING TIPS



WordPerfect 5.1 for DOS

1. Shrink-to-Fit Printing

Need to cram more text than usual on a page to save paper?

You can easily force WordPerfect 5.1 to print text at eight or more lines per inch. The font stays the same, but the space between lines is reduced. Issue these keystrokes while your cursor is just before the text to be printed with that spacing: Press <Shift><F8>LHF, type 1/8 (or another fractional or decimal measurement in inches), then press <Enter><F7>. WordPerfect will shrink the line spacing automatically. —George Campbell

2. Repeat Performance

If your job involves typing repetitive keystrokes—such as inserting a bunch of characters or executing the same macro over and over—WordPerfect 5.x's repeat function can be a real time-saver. To repeat most keystrokes, first press **<Esc>**. At the prompt, type the number of repetitions, then press the key to repeat. For example, to insert 25 spaces, press **<Esc>**, type **25**, and press **<Space>**. The more ways you find to exploit this handy feature, the more you'll come to rely on it. —G. C.

3. Dating WordPerfect 5.1

It's easy to insert today's date into a letter or the latest revision of a WordPerfect document. Just position the cursor, then press <Shift>-<F5>T. Unfortunately, the program defaults to a numeric format (2/3/93). To change the default to a more popular format (such as February 3, 1993), you'll need to do a little more. Press <\$hift>-<F5>F, then press 3<Space>1,<Space>4<Enter> (don't forget the comma after the day of the month). Now, press T if you want to insert the date immediately, or press <f7> to change the default without inserting anything. Of course, you're not limited to these two formats-you can construct others using the codes listed in WordPerfect. -G. C.

4. Quick Character Inserts

WordPerfect 5.1's Compose feature lets you add all sorts of foreign-language and symbolic characters to your documents, but remembering which number codes to use when inserting them can be a chore. Fortunately, WordPerfect provides easy-to-remem-

ber two-character codes for the more popular characters. To insert one of these symbolic characters, move your cursor to where you want to insert it, press <6tr>
- Vor <6tr>

YPE FOR THIS CHARA	
TM	TM
OR	®
00	©
Rx	R
/4	*
/2	*
+	±
L-	£
Υ=	¥
P	1
??	i
11	1
<<	«
>>	n
	4
~~	*
=>	2
=<	≤
=/	#

5. Fast WordPerfect Getaways

Exiting WordPerfect always takes at least three keystrokes, even if you want to get out fast. The macro in the listing below gives you a quick one-stroke getaway. You'll have to create this macro in the macro editor (see "Using the WordPerfect Macro Editor"). Try naming it with an easy-to-remember keystroke combination like ALTQ.WPM. (You could also name it ALTX.WPM, but <Alt> and x are so close together, you might press them both at the

{Display Off} {F7}NY same time and exit unintentionally. Remember: Once you issue this macro command, there

is no going back to save your file, so make sure it's what you really want to do. —G. C.

6. Block That Text!

If you're using <Alt>-<F4> and your cursor keys to mark blocks of text for moving or formatting, you're wasting a lot of time. For faster text selection, use these keystrokes instead of the cursor keys.

KEYSTROKE SELECTS	
Any character	Next matching character
<space></space>	One word at a time
<period></period>	One sentence at a time
<enter></enter>	One paragraph at a time
<home><end></end></home>	One line at a time
<home><down></down></home>	One screen at a time
<home><home><down></down></home></home>	End of document
Charles and the second	

To unmark a text block, press <Alt>-<F4>
again. —G. C.

7. Quick Block Moves

8. WordPerfect's Secret Clipboard

WordPerfect 5.1 lets you store multiple blocks of text (128 characters or less) and then paste them throughout your document. After you type the text, mark the block and press <Ctrl><Page Up>. You'll be prompted for a variable. Type a number between 0 and 9, then press <Enter>. This stores your block in a numbered variable during your work session. Then, anytime you need to paste the block at the cursor, hold down <Alt> and press the variable number—for example, <Alt>-1. You can store up to ten blocks simultaneously using this clip-board-style technique. —G. C.

9. Figuring Fractions

While WordPerfect 5.1 lets you insert some types of fractions via its Compose feature, they are limited to a few common numbers. When you want to add a less common fraction, such as ½, you'll need to customize the numbers using WordPerfect's subscript and

10. Using the WordPerfect Macro Editor

Usually, creating a macro is simply a matter of recording a handful of keystrokes. Sometimes, however, you have to dig in and write one from scratch. Some of the WordPerfect 5.1 for DOS tips that follow include macros that you must create using WordPerfect's macro editor. Here's how to use it.

First, you must press <Home><Ctrl><F10>. Then type a name for the macro and press <Enter>,

```
File INIT-CAP.HPH (CALL) label (CACL) label (CACL) label (CACL) label (CACC) (C
```

WORDPERFECT 5.1'S MACRO EDITOR takes some time to master, but most commands are available from a pop-up list—simply press <Ctrl>-<Page Up>.

or press the desired <Alt>-key combination. Type a description for the macro if you wish, then press <Enter>. You'll see the macro editor screen.

In the WordPerfect macro editor, you must insert different types of commands in different ways. To insert a command shown in **boldface** in the macro below, press <Ctri><Page Up>, select the command from the pop-up list in the upper right corner of the screen, and press <Enter>. If a command is shown <u>underlined</u>, press the appropriate key (for example, <F2> for {Search}). For commands that are **boldface and underlined**, press <Ctrl>-V, then the appropriate key (for example, <Ctrl>-V, then <Home> for {Home}). Type plainly printed text as it appears.

When you've finished creating the macro, press <F7> to save the macro and return to your editing screen. If you need to edit the macro later, press <Ctrl><F10>, type the macro's name or press the <Alt>-key shortcut, then press E at the prompt.

-G. C.

superscript formatting. Here's how to create the 1/2 example:

- Press <Ctri><F8>SP, type the numerator
 press <Right>, then type /.
- 2. Press **<Ctrl>**-**<F8>SB**, type the denominator (32), then press **<Right>**, and continue typing your text. —*G. C.*

11. Hot Tabbing With WordPerfect

If you're laying out a document with a lot of evenly spaced tabs, you'll save yourself big headaches by setting them all at once. Here's how: Press <\$hift><F8>LT to get to the tab setting menu, move the cursor to the leftmost tab, then press <\$Ctrl><End> to delete the current default settings. Now type the position of the first tab, a comma, and the desired spacing. For example, to place the first tab one inch from the left margin, with additional tabs set every two inches, type 1,2. Press <Enter> and the tabs

will appear. Press <F7> twice to return to your document.

You can perform another trick to set all those automatically spaced tabs with the

same alignment, such as centered, right, or even decimal-essential when you're creating tabbed lists of numbers. Start the same way as above, but after pressing <Ctrl>-<End>, type just the position for the first tab and press <Enter>. Then set that tab's alignment by pressing L for a left tab, C for a centered tab, R for a right tab, or D for a decimal tab. Finally, type the starting position and spacing as described above to space your identically aligned tabs across the page, and press **<Enter>** to set the tabs. Again, press **<F7>** twice to finish up. —G. C.

12. Fast as a Speeding Bullet

Inserting a bullet into a *WordPerfect 5.1* list or presentation chart is quick and painless once you know the Compose shortcut. Locate the cursor where you want the bullet, press **<Ctrl>V**, then type one of the character pairs listed below to get the bullet you want. —*G. C.*

BULLET TYPE		
1.		
•		
0		
0		

13. Fast Text Reformatting

If you receive files formatted by other users, you probably long for an easy way to change say, underlined text, to another format, such as italic. The macro shown below will do the job automatically. (See "Using the WordPerfect Macro Editor" for instructions on how to create macros.) To insert the Underline command, press <F8>. For the Italic command, press <Ctrl>-<F8>Al.

To make the macro replace other formatting in your documents, substitute the appropriate commands (such as <F6> for boldface or <Ctrl><F8>AD for double-underlining) in the appropriate places while creating the macro. —R. J. L.

14. Memorable Text Formatting

Quick—what's WordPerfect's formatting command for double underlining? If you answered <Ctrl>-<F8>AD, your memory's

{Display Off}

{ON NOT FOUND}{GO}end-
{Home}{Home}{UD}

{LABEL}loop
{Search}{Underline}{Search}

{Block}

{Search}{Underline}{Backspace}{Underline}{Search}

{Italic}

{GO}loop
{LABEL}end
{Home}{Home}{UD}

{Replace}n{Underline}{Search}

WORD PROCESSING TIPS

better than most. Fortunately, by recording easy-to-remember <Alt>-key macros for the commands you use frequently, you can avoid memorizing WordPerfect's areane text formatting commands. Here's how to create a macro for setting text in boldface:

- Press <Ctrl>-<F10> to start the macro recorder.
- Press an appropriate <Alt>-key combination to match the macro's function, for example, <Alt>-B.
- 3. Type a short definition for the macro and press <Enter>.
- 4. Press **<F6>** (the formatting command for boldface).
 - 5. Press **<Ctrl>-<F10>** to finish recording. Using this process, you can define

macros for all of *WordPerfect*'s formatting commands, substituting the appropriate keystrokes (such as <Ctrl>-<F8>Al for italics or <F8> for underlining) in step 4. To put the macros to work, press one of the <Alt>-key combinations while you type, then press it again when you need to turn the formatting off. You can also select a block of text, then press an <Alt>-key combo to format just that block. —R. J. L.

15. Easy Views of Hard Returns

Unless you open *WordPerfect*'s Reveal Codes window, you cannot tell paragraph endings (hard returns) from line endings (soft returns), and that can make formatting large blocks of text a drag. But there is

a way to force WordPerfect to mark each hard return with a small black square. Simply press <Shift><F1>DEH<Ctrl>-A<F7>. The square will appear on screen, but it will not print.

You can also use a different character as a marker. Instead of pressing <Ctrl>-A in the sequence above, hold down <Alt> while you type an ASCII code on your computer's numeric keypad. For example, <Alt>-20 produces a standard typographer's paragraph marker. You can use any character you want, but avoid normal alphanumeric characters to prevent confusion. You'll find a complete list of ASCII codes in Appendix A of your WordPerfect manual. —Edward L. Mills, Quincy, Illinois

Universal Word Processing Tips

You say you don't use any of the word processors we've covered in our 75 tips? Well, don't turn the page just yet. Here are five general tips you can use regardless of the word cruncher you employ.

16. Protect Your Templates

Any word processor worth its salt comes with prefab templates for creating memos, letters, or virtually any other common document. With built-in page layout, graphics, and text specs, a template can save you hours of design time. The problem is that it's all too easy to use a template, fill it with your own text and graphics, and save it under its original name—thus overwriting all your basic layout information.

The solution is simple: Make the template files read only. You'll still be able to load it and fill it with data, but when you go to save the file the word processor will prompt you for a new file name. The trick is to use DOS's ATTRIB command. First, make sure the directory where ATTRIB.EXE is stored (usually C:\DOS) is in your PATH. Then at the DOS prompt, issue ATTRIB +R [File Specification], followed by a space and the path and name of the template file. From here on, your template files will be free from unwanted intrusions.

17. Quick Text Selection in Windows

Generally, there's no faster way to select a block of text than by using the mouse. Here's

a trick that works in any Windows word processor (as well as Word 5.5 for DOS): Click the left mouse button at the start of the desired block, hold down <Shift>, and click the left button again anywhere else in the document. This will highlight all text between the first and second clicks, and you can do it moving up or down the file. To extend the highlighted area further beyond the second click, hold down <Shift> and click again.

18. Use Keyboard Shortcuts

Keyboards are for more than just typing. Even if you like to use the mouse for moving text around, the fastest way to get work done is usually by keyboard shortcuts. So take another look at your program's shortcut commands, or dust off that keyboard template—you'll find it faster than mousing around in menus.

19. Maximize Your Mail Merge

Most word processors let you break down mail-merge data in ways that make this useful feature even more powerful. For example, splitting a name field down into First Name, Middle Initial, and Last Name fields lets you personalize your mailings by creating Ms. Last-Name or Dear FirstName entries. Similarly, breaking a City, State, ZIP field down into separate fields lets you send documents only to clients in a particular state or ZIP code, or sort the records properly for bulk mail savings.

20. When in Doubt, Dial Up

When you can't seem to find an answer in the program's manual and technical support lines are busy, there's one resource you can almost always rely on: on-line forums. Services like America Online, CompuServe, and GEnie are a terrific resource for valuable tips, top-notch technical support, and a multitude of macros and utilities for your favorite applications. Here's a breakdown on the major on-line services, with the keywords you'll need to direct you to the proper forums:

America Online

General Help	PCWORLD
	(Word Processing)
Microsoft Word	MICROSOFT
WordPerfect	WORDPERFECT
JustWrite	SYMANTEC

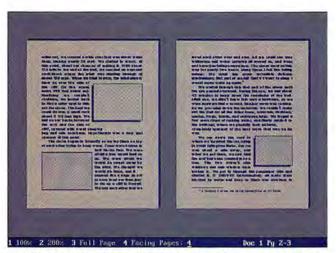
CompuServe

Ami Pro	LOTUS
JustWrite	SYMFORUM
Legacy	WINAPB
Microsoft Word	MSWORD
Professional Write	SPCFORUM
WordPerfect	WPUSER
WordStar	WORDSTAR

GEnie

Microsoft Word	MICROSOF
WordPerfect	WP

-G. C.



ADDING DROP SHADOWS to WordPerfect boxes is an easy way to make charts and tables stand out. The key is using the Graphics (<Alt>
<F9>) menu.

21. Shadow Boxing With Graphics

WordPerfect 5.1 not only lets you create boxes for all the figures, text, and tables in your documents, it also lets you define shadowed borders for each box-an easy way to make items stand out. You can even create shadows for all boxes of the same type in one shot. To try this out, start with a document that already contains boxes, and press <Home><Home><Up> to move the cursor to the top of the file. Now, press <Alt>-<F9>, type the number or letter of the type of box you want shadowed, then press OB. Choose a border type for each side of the box by selecting from the menu options at the bottom of the screen. Use your cursor keys to move to each side in turn. Select Thick or Extra Thick for two adjacent sides, and Single for the other two. Press <F7> to return to your document. The thick lines are offset for a dropped shadow effect. To view your work, press <Shift>-<F7>V. -Robin Noe, Oak Ridge, Tennessee

22. Printing WordPerfect File Lists

Need to find a file fast? Instead of scrolling through *WordPerfect*'s file list one screenful at a time, you may find it faster to print out a list of all your files at once. Here's how: Press <F5> to get to the file list, then press <Shift><F7>. You'll get a printed list, formatted as it is on the screen but including all files in the directory, not just a screen's worth. —G, C.

23. More Formatting Shortcuts

If you work frequently with WordPerfect's Reveal Codes window (<alt>-<a>Reveal Codes window (<alt>-<a>Reveal Codes window

to edit specifications for margins, headers, graphics boxes, and other codes, you'll appreciate a tool in version 5.1's SHORTGUT keyboard layout. To get to it, though, you'll need to install the alternative keyboard template, as described in the next tip.

Once you've installed SHORT-CUT, press <all> **<F3>** to open the Reveal Codes win-

dow. Use the cursor keys to select any formatting code. Then, to edit that code, press <alt>-E. You'll see the menu associated with that code instantly, and can make any changes you like. This tip saves a lot of time, particularly when editing complex codes set in long menus, such as column setups or graphics box layouts. —WordPerfect Corp.

24. Keyboard Alternatives

When you installed WordPerfect, you also got several customized keyboard templates installed in your main WordPerfect directory. Each one remaps your keyboard, offering shortcuts that can speed up various word processing chores.

Here's a list of the supplied templates and their functions (for a complete list of keystroke assignments for these keyboard layouts, see Appendix H in your *WordPerfect* 5.1 manual):

TEMPLATE	FUNCTION
ALTERNAT	Reassigns Help and Cancel keys
ENHANCED	Adds commands for 101-key keyboards
EQUATION	Keyboard shortcuts for the equation editor
MACROS	Keystrokes for 16 WordPerfect-supplied macros
SHORTCUT	Formatting shortcut keystrokes

To choose one of these templates as the default, press <Shift><F1>K to display the list, select a template using the mouse or cursor keys, then press <Enter> twice to return to the editing screen. The template you select becomes the default whenever you start WordPerfect.

When you want to switch back to your original keyboard template—say, to run one of your own keystroke macros—just press <**Ctrl>-6**. (However, your alternate keyboard will remain the default until you choose another using the <Shift>-<F1>K command.)—G, C.

25. Expand Your Editing Horizons

If you're settling for *WordPerfect*'s basic 25-by-80-line text screen, you may be limiting your horizons unnecessarily. Users of Hercules, EGA, VGA, and higher-resolution video boards can display up to 50 lines of text on a single screen. In addition, some display boards even come with specific video drivers for *WordPerfect* that increase the maximum number of characters in a line. While the characters will be smaller and the lines a little cozier, everything will still be readable.

Press **<Shift>-<F1>DT**, pick your display adapter type and press **<Enter>**. Select the screen resolution you want, then press **<Enter><F7><F7>**. The new setting you've selected becomes the default automatically. If you don't like what you see, you can return to your basic resolution by pressing **<Shift>-<F1>DTA<F7>**. —G. C.

26. Shrink Your Files

If you use graphics in WordPerfect documents, odds are you're wasting valuable disk space. The default settings in the program cause WordPerfect to save a copy of the graphic inside the document file. If you reuse the same image in several documents, the program creates separate copies of the graphic for each, eating up precious hard disk real estate. But there's a quick fix.

To create a figure box for a graphic, press <alt>-< F9>FC, type in a file name, then set the positioning and other options. If you want to conserve disk space, press 0 while the menu is displayed, D to select the *Graphic on Disk* option, then hit <F7> to return to the document. WordPerfect will then store a pointer to the graphic file, not the file itself, inside your document.

Of course, if you delete the graphic file, move it to another directory, or send the file to someone else, *WordPerfect* won't be able to find it if you use this method. If that situation is likely to occur, it's best to use the default *Graphic* option in the menu, which stores the graphical data itself in the document file. —*G. G.*

WORD PROCESSING TIPS



WordPerfect 5.1 for Windows

27. A Familiar Feel for Windows

Making the jump from the DOS version

of WordPerfect to the Windows version isn't as easy as you might think. For one thing, all the keyboard shortcuts that you have come to know have been changed. Press <F5> in the DOS version and you get the file list; press <F5> in the Windows version and you get the printing dialog box. Fortunately, you can go home to your familiar DOS keystrokes, but only if you have the interim upgrade dated April 30, 1992. (If you don't have this update, contact Word-Perfect Corporation.)

Select File • Preferences • Keyboard • Select, highlight WPDOS51.WWK in the Files list, then choose Select and OK. You'll get most of your old keystrokes back, along with familiar keyboard shortcuts displayed inside your pull-down menus. You can then choose between the Windows or DOS keystrokes for most of your formatting commands. —G. C.

28. Adding Special Characters

Unlike the DOS version, WordPerfect 5.1 for Windows doesn't let you use the handy <Ctrl>-V or <Ctrl>-2 Compose command to insert special characters. To use this function in Windows, move the cursor where you want to insert the character, then select Font • WP Characters or press <Ctrl>-W. A window will pop up, showing a chart of the characters. Scroll down the list of character

sets until you find the one you want. To insert a character into your document, you can double-click the character itself or select it and click *Insert*. You can then choose additional characters to insert. If you want to add just one character and return to your editing, select *Insert and Close*.

All these special WordPerfect characters will print using

either WordPerfect or Windows printer drivers. If the special character isn't available in the current font, however, WordPerfect will print it as a graphic; it may look slightly different from the font used for the rest of the text. —G. C.

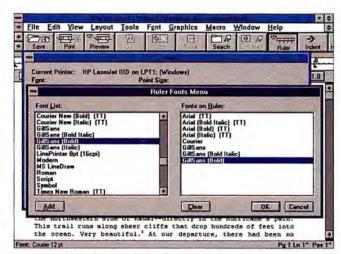
29. Customize Your Font List

Many Windows word processors give you a fast-access font button, but only WordPerfect for Windows lets you customize the button's font list to show only those fonts you use every day. Here's how to do it. Start by double-clicking the Font button on the ruler. In the next dialog box, select Assign to Ruler. In the Ruler Fonts Menu box, highlight each font you want to add to your font menu, then double-click on it or select Add. If you make a mistake, highlight the offending font in the Fonts on Ruler list, then select Clear. When you're done

adding the fonts you want, select *OK* twice. Now, whenever you click the ruler's *Font* button, you can drag down to the font you want and simply release the mouse button. —*G. C.*

30. Eyeing the Bottom Line

Unlike some programs, WordPerfect for Windows' mouse pointer does not change shape when



WORDPERFECT FOR WINDOWS lets you choose which typefaces to assign to its ruler button, for quick access to your workhorse fonts.

it passes over picture boxes, lines, and other objects. Instead, you need to keep an eye on the status line at the bottom of the editing screen.

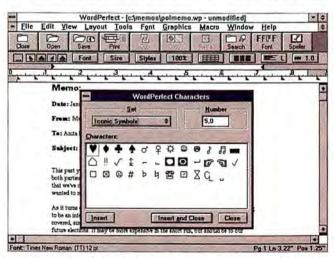
A good example of this occurs when you've drawn a horizontal or vertical line in your document with the *Graphics • Line* command. It's tough to tell just when the pointer is in the right position to operate on the line. But look at the status line, and you'll be able to see when you're directly over the line. A left click will then select the line, while a right click pops up the appropriate menu. —*G. G.*

31. Double-Click Button Bars

You may not know it, but WordPerfect for Windows' button bar has a dual personality. Click once on the Font button, and you'll get your customized list of fonts. Click twice, and you'll get the complete font selection dialog box with all the fonts on your system—considerably easier and faster than slogging through a series of pull-down menus. Double clicking on the Size, Table, Styles, and other buttons also puts you quickly inside the appropriate dialog boxes. —G. C.

32. Wholly Macros

Need a handy tool in WordPerfect for Windows? Don't waste your time trying to reinvent the wheel. When you installed the program, WordPerfect for Windows installed a number of powerful, undocumented macros that can speed up your work. Here's a list of the more useful ones (the exact macros you have depend on the release date of your copy):



CHOOSING SPECIAL CHARACTERS in WordPerfect for Windows is a snap—just use the Font • WP Characters command.

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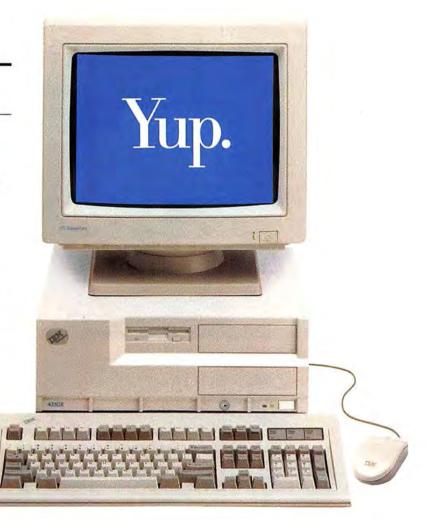


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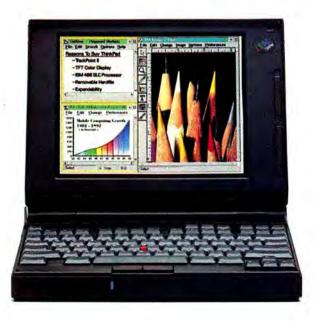
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RECALC.WCM	Automatically recalculates all formulas in a table

To have a look at these and other included macros, select *Macro • Play • View*. Select one of the macros on the list, then read the description comments in the View window.

To run the macro, select *Play*. The first time you run any macro, *WordPerfect* compiles it, so it'll run rather slowly. From then on, you get it at full speed. —*G. G.*

33. Customize Your Defaults

Open a WordPerfect for Windows document, and the program defaults to 12-point Courier font and 1-inch margins. But why be dull? You can customize WordPerfect's default fonts, margins, and virtually any of its other settings in flash. Just select File • Preferences • Initial Codes. The program gives you a blank document where you can set defaults, and displays the formatting codes you choose in a window. To change fonts, select Font • Font, choose the font name and size you prefer, along with any other formatting such as bold or italic, then select OK. To set new margins, select Layout Margins and enter new measurements. When you're finished making changes, select Close to return to the editing screen. From now on, your new settings will be the default. -G. C.

34. Turning the Tables

If you're using the April 30, 1992, interim release of WordPerfect for Windows 5.1 (or version 5.2), you've got some new tools you may not be aware of—like the ability to duplicate all or part of an existing table inside the same document. With the new drag-and-drop features, it's easy.

Choose a document that already contains a table. Move the cursor inside the table, hold down the left mouse button and the <Ctrl> key, and drag the mouse to select the cells you want duplicated. You can choose a single cell, a block, or the complete table. Release the mouse button and <Ctrl> key, and position the mouse pointer anywhere inside the area you just selected. Hold

down the left button again, drag the pointer to the location where you want to paste the table, and release the button. —G. C.

35. Short-Order Menus

If you're like most users, you employ only a fraction of WordPerfect for Windows' wealth of features. But whenever you drop down a menu, you see what

you don't use. Here's a trick that lets you switch back and forth between WordPerfect for Windows' full and short menus in the same work session.

First, make sure WordPerfect for Windows isn't running. Fire up Windows' Notepad or your favorite text editor and load WPWP.INI, which you'll find in your main Windows directory. Scroll to the section marked [Settings] in the file and add the line EnableShortMenus=1 immediately following the [Settings] line. You'll see another line in this section that reads, Short-Menus=0. If you'd like the program to start up with abbreviated menus, change the line to read ShortMenus=1. After you've made these changes, save the file and exit Notepad.

Now, start WordPerfect for Windows and select View. In the menu that drops down, you'll see a new entry, Short Menus. Select this command to add or remove the checkmark beside it. If it's checked, you'll see just the basic menus. If it's unchecked, you'll see the expanded, full menus. You can toggle back and forth between the options at will. —G. C.

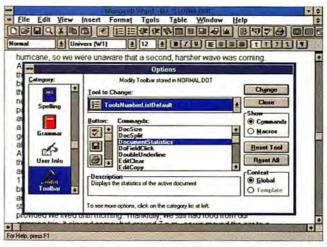


Microsoft Word for Windows 2.0

36. Custom Toolhars

Why waste time hunting for macros in the Tools•Macro menu

when you can call them with a click of a button? WinWord makes it fairly easy to decide which tools and commands you want to display as icons on its customizable



PUSH-BUTTON WORD PROCESSING: You can customize WinWord's toolbar, assigning buttons to your own macros or favorite commands.

button bar. (Select *View • Toolbar* if the toolbar isn't visible just below the menu bar.)

First, select Tools • Options, press T to get to the Toolbar Options dialog box, and select Macros in the Show box. Scroll down the Macros list until you highlight the one you want to turn into a button, then scroll the list of buttons to select one you want to assign to the macro. The Tool to Change list displays the names of all the buttons currently on the toolbar, as well as the empty spaces between them. Scroll down the list and select the button or space you want to replace, select Change, and then Close. Your new macro button appears instantly in your toolbar. Click once on the button to let it work its magic.

You can perform the same trick with commands, adding and deleting them from the toolbar at will. Simply select *Commands* in the Show box and follow the procedures outlined above. When you exit *WinWord*, be sure to select *Yes* when prompted to save global changes. —*Christina Wood*

37. Jump-Starting WinWord

If you do the same thing each time you start Word for Windows—say, choose the Find File or Open command from the File menu—you can save time by having Win-Word execute that first command for you. Just select your WinWord icon in Program Manager and press -<Enter">Alt>-<Enter> to open the Properties dialog box. Position the cursor in the Command Line box after WIN-WORD.EXE, type a space, and type /m followed by the startup command you want, for example, /mFileOpen or /mFileFind. (You can use this /m switch with any WordBasic com-

WORD PROCESSING TIPS

mand or macro name.) Then click OK. The next time you double-click the Word for Windows icon, it will start WinWord with the Open or Find File dialog box ready for you to use. But make sure that the Command Line box includes the full path to your Win-Word directory, otherwise the tip may not work. —R. J. L.

38. Custom Menus

While toolbars may vary from template to template, menus are forever. You can add an indispensible macro to one of WinWord's pull-down menus and access it quickly no matter what template you're using at the time. Here's how:

Select *Tools • Options*, press M to call up the Menus Options dialog box, and select *Macros* in the Show box. Then select the name of the macro you want to add and the menu you want to add it to. Select *Add*, then *Close*. Remember: You need to accept all global changes at exit time, or you'll have to do this procedure all over again. —G. C.

39. Drag Till You Drop

As just about everybody knows, Word for Windows 2.0 lets you select text with the mouse, then drag it to a new location in your document. But did you know that the same technique works for virtually every item in a document, including tables, pictures, charts, and inserted OLE objects? For most objects, the steps are the same as with text: Place the cursor inside the object, hold down the left mouse button to select it, drag it to a new locale, and release the button. With tables, it's a touch trickier: You'll have to click and drag to select the entire table, then release the mouse button. Move the pointer back into the selected area, hold down the left button, then drag and release as usual.

Want to copy the item to a new location instead of moving it? Simply hold down the **<Ctrl>** key before and while you release the mouse button. —*C*, *G*.

40. Fast Global Font Changes

You can change the font of an entire Win-Word document with just a few keystrokes. First, press <Ctrl>-5 (using the numeric keypad) to highlight the entire document, then hit <Ctrl>-F and press <Down> (or the first letter of the desired font's name) to scroll through the list of fonts. Once you've selected a typeface, you can change its size

by pressing <Tab>
and typing a new
point size. When
you're done, just
press <Enter> and
return to your editing. —Daniel Tynan

41. WinWord Marks the Spot

If you often work on long documents, you should be using Win-Word's Bookmark feature. By inserting named bookmarks, you'll make it easier to jump to any sec-

tion, chart, graphic, or other location you'll need to find quickly when editing.

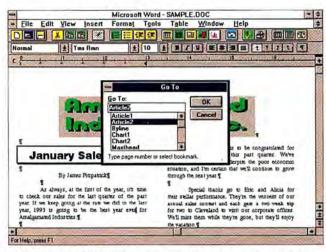
To insert a bookmark, place the cursor where you want the mark to be, then select Insert • Bookmark to get the Bookmark dialog box (or press < Ctrl> < Shift> < F5> for a simple prompt on the status bar at the bottom of the screen). Type a brief name for the bookmark, then select OK (or press < Enter>). Remember, though, if you select a block of text or an object before inserting the bookmark, that text or object will be highlighted again when you jump to that bookmark. If you delete or move the highlighted items, the bookmark is similarly affected.

Now, any time you need to return to that point in your document, select $Edit \cdot Go \ To$ (or hit <**F5>**), pick your bookmark from the list (or type the bookmark's name), and select OK (or hit <**Enter>**). —G. C.

42. Need it Again? Spike It.

If you need to store one or more blocks of text or objects such as graphics, tables, or charts in *Word for Windows*, use the Spike feature, which stores the data temporarily for insertion later. Simply select the text or object, then press <Ctrl>-<F3>. This cuts the

data from the document and loads it into the Spike buffer. Unlike Windows' Clipboard, you won't lose your previous cuts when you add new ones—you can repeat the process to store multiple objects in the Spike buffer. It's a great way to gather up bits and pieces, then insert them elsewhere.



WINWORD'S BOOKMARKS let you jump instantly to any location in a file—a priceless tool for long documents.

To copy contents of the Spike into your document, locate the cursor where you want the item, then type spike and press <F3>. You can repeat this command as many times as you like to paste the same data. If you want to insert the Spike's contents just once, clearing it from the buffer at the same time, press <Ctrl>-<Shift>-<F3> instead.

Best of all, you can store data from one WinWord document in the Spike buffer and reinsert it in another WinWord document window you have open. Exiting WinWord flushes the contents of the Spike. —G. C.

43. Counting Blocks

While WinWord gives you fast word and character counts for a whole document, it won't let you measure individual sections of the file—a nice tool to have when you're trying to make different parts of a long file the same length. Fortunately, we've cooked up a macro that does the job for you.

First, you'll need to fire up the WordBasic macro editor: In WinWord, select Tools. Macro, type CountSelect, then select Edit. In the macro editor, carefully type the lines in the listing below between the Sub MAIN and End Sub entries.

```
EditCopy
FileNew .NewTemplate = 0, .Template = "NORMAL"
EditPaste
Dim dlg as DocumentStatistics
GetCurValues dlg
Dialog dlg
Super DocumentStatistics dlg
Super EditUndo
FileClose
```

Finish up and save your macro by selecting File • Save All, and then select Yes in all the dialog boxes that pop up. Exit the macro editor by selecting File • Close.

To use the macro, select the block of text you want to measure, then select Tools• Macro. Choose the CountSelect macro, then select Run; or double-click Count Select. You'll see the statistics for just the selected block. Select OK to return to the document. If you find you use this macro frequently, you can assign it to a keystroke combination or to an icon on WinWord's toolbar. —John Walkenbach

44. Notes to Yourself

Word for Windows has the equivalent of Post-it notes, and they're easy to use. Whenever you need to leave yourself or another user a note in a document, select Insert • Annotation, type your note in the window at the bottom of the screen, then select Close. There's just one problem—WinWord's default settings don't let you see the marker for the note because it's formatted as hidden text.

To view the markers in your document, and make that option the default, select Tools • Options, press V to get to the View settings, then check the Hidden Text box and select OK. For each note in the document, you'll see an identifying marker that consists of your initials and a number inside square brackets. Repeat the operation to uncheck the box when you want to hide the note markers.

To view the note, double-click the marker, then select *Close* when you're through. To remove a note permanently, simply select the marker with your mouse or keyboard and press <Delete>, -G, C.

45. Word and Pictures

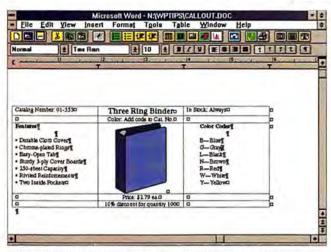
Do you need to insert a picture in a Word for Windows 2.0 document, then position descriptive text nearby? An easy way to do this is to create a table and insert the graphic into a cell, then add the text

into neighboring cells. To create a table, select Table • Insert Table. For best results, you should specify an odd number of rows and columns, so you can locate the picture in the center of the grid, and size the cell as desired. Move the cursor into one of the cells, select Insert • Picture, select a graphic, then select OK. The picture will appear in the cell. To center the picture inside the cell, highlight it and click the centering icon on the ribbon (select View • Ribbon if the ribbon isn't visible). Now you can use the other cells of the table for your text. This is a great technique for creating product descriptions in catalogs and flyers. —G. C.

46. No More Disappearing Text

As in most Windows programs, when you select a block of text in Word for Windows, anything you type replaces that text. This can be especially annoying when you search

for a text string: The text string remains selected, then the next key you press overwrites it. Although you can get the text back with a quick Edit. Undo command, you might want to disable this overwrite feature. Making the change is easy. Select Tools. Options, press G, then uncheck the Typing Replaces Selection box. Se-



SURROUNDING WINWORD PICTURES with descriptive text or captions is a lot easier when you use a table to hold both picture and text.

lect OK to finish the job and make your choice the new Word for Windows default. From then on, if you type while text is selected, your new text will appear to the left of the selected text, just as it does in Word 5.0.—G. C.

47. WinWord's Go-Back Key

If you've selected text or an object in a Word for Windows document, then used the scroll bars to look at something else at another location in the document, WinWord offers a quick way to get back to where you were. Just press <hi>Shift><F5>.

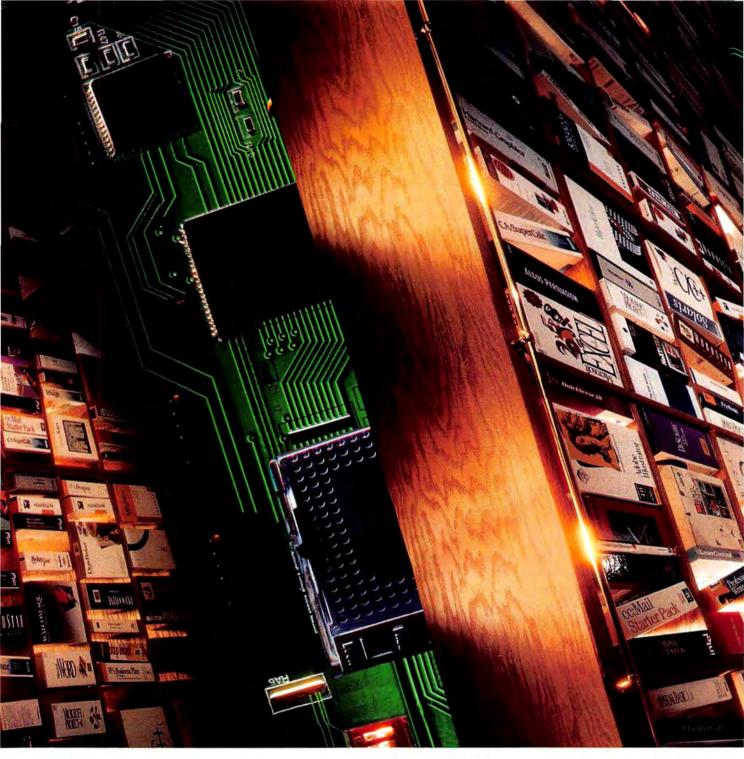
But there's more to this magic keystroke. If you press <\$hift><\$f5> immediately after loading a document, the cursor will return to exactly where it was when you saved the file. WinWord stores the last three cursor positions as you work on a document. Repeated presses of <\$hift><\$f5> take you back one step at a time. —G. C.

48. Using Special Characters

Everyone needs to use a special character now and then, whether it's a foreign currency mark or a star from a dingbat font. To access special characters from Word for Windows, select Insert • Symbol. Scroll down the list of symbol sets until you find the one that contains the character you want, then look at the character grid. To insert the character, double-click on it with the mouse or use the cursor keys to select it and hit <Enter>. (If you have the Field Codes box checked in the Tools • Options • View dialog box, you'll see the symbol's field marker. Uncheck the box to see the symbol itself.) Once the character is



WINWORD USERS TAKE NOTE: You can annotate documents and view your notes with a mouse click—just turn on the Hidden Text view.



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WORD PROCESSING TIPS

in the document, you can alter its size as you would any other character. —G. C.

49. Instant E-Mail Formatting

Creating properly formatted ASCII files for uploading to electronic mail systems or services like MCI Mail can be a chore. Unless you're extremely meticulous, you're likely to get funky line breaks all over the place. Here's a macro that does the job in a flash.

To create it, you'll have to crank up Win-Word's WordBasic macro editor: Select Tools • Macro, name the macro FormatEmall, then select Edit. In the macro editor, carefully type the lines shown in the listing below between Sub MAIN and End Sub.

any command, such as Format • Character, before typing the text.)

WinWord also remembers formatting commands, and can repeat them with <F4> (or Edit • Repeat Formatting). For example, if you need to reformat several words or paragraphs in different locations, highlight the first word and make the formatting changes using the Format menu. Then you can select other text and press <F4> to duplicate

If you press <F4> (or select Edit • Repeat

Typing), the program will insert all that text

at the cursor position. You can type some-

thing once, then move the cursor and press

<F4> to insert the same text. (To make sure

there's no other text inside the buffer, issue

the effect.

Finally, if you're not sure of the status of the repeat key at any time, just pull down the *Edit* menu and take a look. The Repeat menu entry always remembers the last thing you did. —*G. C.*

51. Dating WinWord Docs

Having WinWord insert the current date auto-

matically every time you open a document is a good way to track revisions, and it's easy to do. Select *Insert* • *Field*, then pick *Date* in the Insert Field Type list in the dialog box. Choose a format from the Instructions list (the *MMMM d*, yyyy option gives you a fully expanded date, as in January 25, 1993). Select *OK* to insert the date field at the cursor. You can add boldface or other text attributes to the date and set its alignment with normal commands. Each time you load the document, the current date will display. —*G. C.*

52. Calling All Fonts

Did you ever wonder what all your fonts look like on paper? If you have the Word for Windows 2.0a upgrade or a later one, you can find out.

When you installed WinWord, you also installed a document called PSS.DOC on your hard disk. Load it into your word processor. A number of self-installing macros are included in the document, including one called Printer Test that creates a document containing samples of every font you have available, along with border

and shading styles. Scroll down in the PSS.DOC file until you find PrintTest's description, double-click its RUN button, then select OK. (If you have the Field Codes box checked in the Tools • Options • View dialog, the RUN button won't work.) The macro will create the document, which you can then print out. If you have scores of fonts, the process can take several minutes. Take a look at the other macros in PSS.DOC as well—you're sure to find others you want to try. —Microsoft Product Support

53. Changes in Styles

Word for Windows includes a set of more than 20 preset styles for your text in its NORMAL.DOT template. These include nine heading styles, eight table of contents styles, plus footnote and annotation styles. But when you use the Format • Style dialog, you normally see only a partial list. While it's true that you may not need all these styles, wouldn't it be nice to see them and decide for yourself? Here's how.

Select Format • Style, then press < Ctrl>-Y. WinWord will add the hidden styles to the drop-down list, making them instantly available. You'll have to repeat this keystroke each time you use the dialog box and want to see the complete style list. — Microsoft Product Support

THE GRANT WAS A STATE OF THE ST

Microsoft Word for DOS

54. Fast File Loads

Everyone sometimes needs to exit a word processor completely

to do some other work, then return to editing the same document. In any version of Word for DOS, it's easy. Just start Word with the command WORD /L at the DOS prompt. Word will automatically load the last document you worked on, with the cursor right where you left it. —G. C.

55. Making Word 5.5 More Familiar

If you've switched to Word 5.5 but miss the function keys you're used to from earlier versions of Word, you don't have to learn an entirely new system. You can go back. Select Utilities • Customize, then check the Use Word 5.0 Function Keys option. If you're used to the way the <Insert> key worked in earlier versions, check the Use

EditSelectAll

Prompt\$ = "Enter a file name for your Email text file:"

Title\$ = 'Email File Name'

Default\$ = ""

MyFile\$ = InputBox\$(Prompt\$, Title\$, Default\$)

If MyFile\$ = "" Then Goto Quit

Font "Courier", 12

FileSaveAs .Name = MyFile\$, .Format = 3

NormalStyle

SendKeys "{left}"

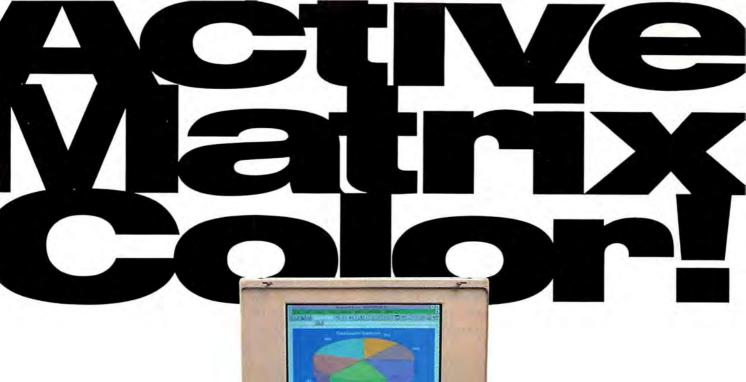
Quit:

When you're done, check your typing, select File • Save All, and select Yes at all the prompts that appear. Select File • Close to get back to your document.

To use the macro, start WinWord and type your E-mail message. When you're ready to save it, select Tools . Macros . FormatEmail. Enter a file name when prompted, complete with path information if necessary, then select OK. The macro will reformat your text as 12-point Courier, with hard carriage returns at the end of each 60-character line. It then saves the new file, with the file name you specified, in ASCII format with carriage returns at the ends of the formatted lines. You can then send that file as an E-mail message using your communications or E-mail package. Then your document will return to its original formatting, and you'll return to the top of the document. -G. C.

50. Smart Repeats

WinWord has an elephant's memory. In fact, WinWord will remember everything you've typed, including backspaces, since the last time you executed some other command.





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MOVING UP FROM WORD 5.0? Version 5.5 makes the transition easier by letting you choose 5.0's familiar function-key combos.

Ins for Overtype Key option as well. Select *OK* to finish up and store these settings as the defaults. —*G. C.*

56, One-Word Spelling Check

You don't always want to check the spelling of an entire document. In Word 5.x, you can easily check the spelling of just part of a document. Highlight the text to be checked, then give the check spelling command (<Alt><\F6> in version 5.0 or <\F7> in version 5.5). Word will check only the highlighted text, letting you get back to work more quickly. —G. G.

57. Instant Text Moves

If you need to move a block of text in *Word* 5.x, here's a trick for mouse users. Start by highlighting the text you want to move, using the mouse or *Word*'s keyboard shortcuts. Now, move the mouse pointer where

you want the text to go, hold down the **<Ctrl>** key, and click the right mouse button. Your text, still highlighted, will move instantly to the new location. —G, C.

58. The Big Picture

If you'd like to see more of your document in *Word* 5.0, and you're using an EGA, VGA, or Herculescompatible monochrome system, you can see up to 60 lines of text on your screen. The result may not be pretty, but you'll be able to see an entire page of text at once without scrolling. First, press <Esc>0, tab to the Display Mode field press <F1>. You'll see a menu of the text and graphics options for your display type. Select the one you want

and press <Enter> to make it the default.

You'll find the same options in version 5.5. Select *View • Preferences*, then choose a Display Mode from the list and select *OK*. Here's the best part: In both versions, *Word* remembers the previous display option as well. To switch back and forth between them, press Alt>-<F9>. —G. C.

59. Quick Bordered Text

Need a border or lines around some text in Word for DOS? It's easy. Start by positioning your cursor inside the paragraph to be boxed. Then, in Word 5.0, press <Esc>FB. Select the options you want from the fields in the menu, then press <Enter> to create the box. In Word 5.5 the process is slightly different: Select Format • Borders, make your selections in the dialog box, then select OK to finish the job. (If you want a single box around multiple paragraphs, press <Shift>-

Rappaport. I put then on 1st pile in the corner, on top of my hat.

Baron says the new version is great. Then he rewrites it, including two paregraphs saying Sec. of State not strong enough supporter of International widdlife preservation—anticipating Moody's interest in favorite cause of Big Boss Townsend. Baron's writing is very fluid, since he is not saddled by complicated facts burdening anyone who has read large books of Rappaport's file. Baron in tip in off to San Francisco file on the hippie crowd. 40 nore pages arrive from Rappaport.

"Woody says he loves the story. Then he mays to write it

FORMAT BORDER type: None(Bos)Lines line style: Thick above: Yes(No) hackground shading: 0 shading color: Black below: Yes(No) shading color: Black Enter border line style or press F1 to select from list
Pg2 Co20 () Pd. Microsoft Hord

SURROUNDING A BLOCK OF TEXT with a border is easy using Microsoft Word's Format Borders command.

<Enter> instead of <Enter> between paragraphs.) —G. G.

60. Word's Glossary Memories

How many times have you typed your name and address into a letter or other document? Don't waste your time. With *Word 5.x* you can store those phrases, as well as entire blocks of frequently used text, as Glossary entries with all their formatting intact. Here's how.

In Word 5.0, start by typing and selecting a block of text you want to store. Now, press <Esc>C. Type in an abbreviation for the text—one you'll remember easily—such as Myname or ReturnAddress. Use any abbreviation you like, but without spaces or punctuation. Press <Enter> to store the abbreviation and text. Repeat this as often as you like, adding Glossary entries in any Word session. To save the entries, press <Esc>TGS<Enter>.

To store a glossary entry in Word 5.5, select the text, then select Edit • Glossary. Type in a glossary abbreviation or name, then select Define. To save your glossary entires, select Edit • Glossary • Save.

Now, whenever you need one of these entries in either *Word* version, just type the abbreviation and press <F3>. *Word* will insert the whole entry at the cursor position. If you can't remember the abbreviation for a glossary entry, press <Esc>I<F1> in version 5.0, or select *Edit* • *Glossary* in version 5.5, then pick the glossary entry you need from the list. —G. C.

61. Fast Moves With Bookmarks

If you work on long documents, don't neglect Word 5.0's speedy bookmarks. By placing a bookmark at spots in your document you need to find frequently, you'll be able to speed up your editing dramatically. To insert a bookmark at the current cursor position or on selected text, press <Esc>FK, type an easy to remember name for the mark (no spaces), then press <Enter>. When you need to jump to that spot from anywhere in the document, press < Esc>JK, type the bookmark's name or press <F1> to pick it from a list, then press <Enter>. If you highlighted a block of text when you created the bookmark, that text will be selected after the jump. -G. C.

62. Back to the Beginning (or End)

When you've selected a large block of text in Word 5.x or earlier versions, the begin-

ning or end of the block may be off the screen. Once you perform formatting or another operation on the block, you'll want to get back to the start or end of the block quickly. It's easy. Press <left>Right and you'll find yourself back where you started, with the previously selected text deselected. To move just past the end of the block, press <left> instead. —G. C.

63. Fast Mouse Selections

Word 5.x offers a quick way for mouse users to select either whole lines or entire paragraphs of text. To make this work, position the mouse cursor in the blank area to the left of the text to be selected. To select a line of text, click the left button. A right click selects the entire paragraph. —G. C.



Ami Pro 2.0 and 3.0

64. What's My Icon?

Ami Pro's SmartIcons icon bar can really speed up your work,

but it can be tough to remember what a particular icon does. In versions 2.0 and 3.0, your right mouse button is the key to end the confusion. Just click and hold the right button on any icon to see a description of each tool in the Title Bar.—G. C.

65. Reverse Type

Using white text on a dark background (known as reverse type) is an easy way to make your documents stand out. While Ami Pro won't let you format normal text this way, you can still create this effect in version

2.0 or 3.0. Start by creating a frame for the text by selecting Frame and specifying the frame's size and position. Double-click in the frame, type your text, and then select it. Format the text using the Text Font command, selecting the font and attributes you want, then click on the white square inside the Font dialog box's color selection bar,

and press OK. The text will seem to have disappeared, but don't worry, it's still there.

Now select Frame • Modify Frame Layout. Inside the dialog box select Lines & shadows in the Frame area. Click on the black square on the Background color selection bar, then click OK. Voilà! You now have white text against a black background.

To choose another color for the background, display the expanded color selection chart by clicking the arrow in the Background section, then select the shade you want. Your text will appear and print as white letters on your selected background shade. But remember, reverse type is best used sparingly, for headlines, section titles, and other attention-getting text. —G. C.

66. Ami Pro's Secret Macros

Ami Pro ships with a healthy collection of helpful macros, but you may not read about

> them in the manuals. To get the scoop about Ami Pro's undocumented macros, you'll need to start Ami Pro and open GOODIES-.SAM, which you should find in your Ami Pro default document directory. Here you'll get an annotated list of some of Ami Pro's more interesting macro-based tures. While both version 2.0 and 3.0



GOOD SAMARITAN: AMI PRO comes with a bunch of undocumented macros. To read about them, open up Ami's GOODIES.SAM document.

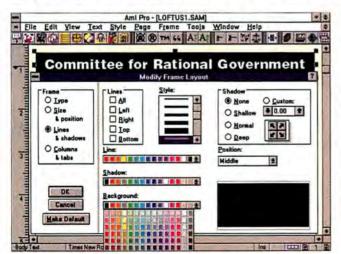
sport a good-size set of fancy macros, 3.0's are especially hot, with new tools for modifying menus, batch printing and file conversion utilities, an area code finder—even a game that runs in the Ami Pro window. To help you add any or all of these macros to your Ami Pro 3.0 menus, select Tools • Macros • Playback, pick SPECIALESMM, and select OK, then follow the instructions on the screen. Version 2.0 users will have to add their goodies to menus manually. Don't miss these valuable tools.—G. C.

67. True Typographical Characters

You can't type typographically correct opening and closing double or single quotation marks, apostrophes, or dashes in *Ami Pro 2.0* or *3.0*—they're simply not on the keyboard. While you can hold down <Alt> and type the ANSI codes for these characters on the numeric keypad, *Ami Pro* offers a better solution in its SMARTYPE.SMM macro, installed with the program.

First, create your document the normal way, typing keyboard quotation and apostrophe characters. Where you want a dash, type two hyphens. Then, if you're using version 2.0, select Tools • Macros • Playback, select SMARTTYPE.SMM from the list of macros, then select OK. Ami Pro will go through the document, changing quotation marks, apostrophes, single quotation marks, and your double hyphens into the typographical equivalents.

It's even easier with version 3.0. Click on the SmartIcon selector icon at the bottom right of your screen, then choose the *Macro Goodies* option. The SmartType icon looks like an opening quotation mark and will run



NEED TO CREATE REVERSE (white on black) type in Ami Pro? The trick is to put it inside an object frame.

We figured it would take a Wizard to make your job easier.



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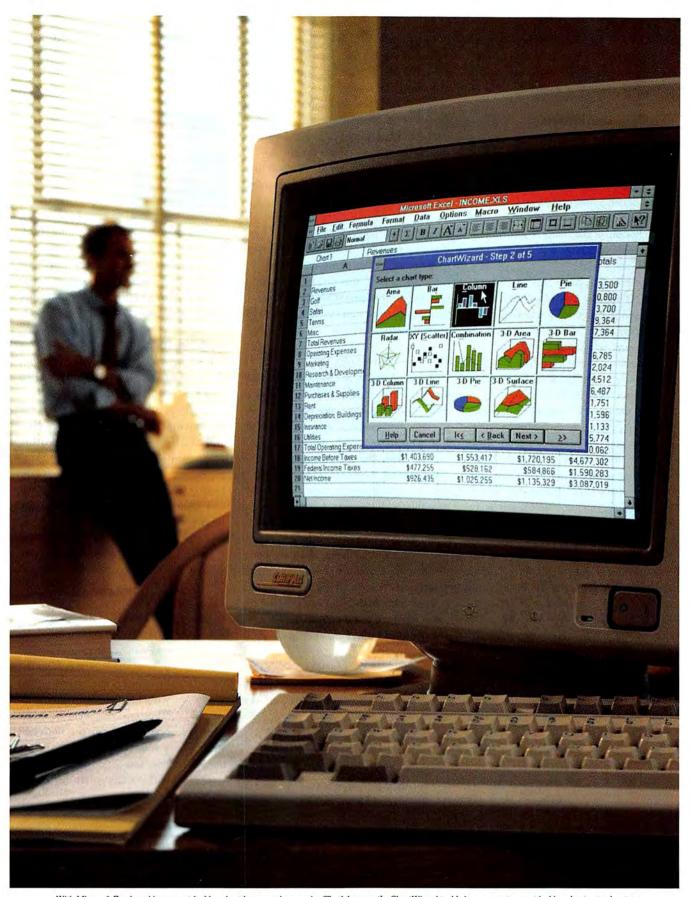
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WORD PROCESSING TIPS

the macro automatically. Version 2.0 users can add this macro to their icon bar manually in the *Tools • Smartleons • Customize* dialog box.—Dan Shackelford, Fullerton, California

68. Mix and Match Smartlcons

Ami Pro 3.0 ships with eight complete sets of SmartIcons. Each set is designed to complement different tasks, such as editing, proofing, and working with graphics. To switch between them, click on the SmartIcon icon on the right side of the status bar at the bottom of the Ami Pro screen, then pick the set you want to use. —G. C.

69. Smarter-Looking Icons

You don't like the look of an Ami Pro 3.0 SmartIcon? Change it by selecting Tools. SmartIcons. Select Edit Icon, then in the next dialog, select the icon to edit and, choosing colors from the color bar, draw with your mouse to alter the icon. When you're done, select OK to finish the change.

If you use a VGA or super-VGA monitor, there's an easy way to display more Smart-Icons on your Ami Pro 3.0 screen: Make them smaller. To do this, select Tools. SmartIcons, select the Icon Size button, then select the Small (EGA) option and click OK. From then on, you'll see more of the Smart-Icons at once, in a smaller size. —G. C.

70. Fast E-Mail Formatting

You can format documents for electronic mail using $Ami\ Pro\ 2.0$ or 3.0, but it takes a macro to do the job quickly. To create the macro, fire up $Ami\ Pro\$ and start with a blank screen. Then type the macro lan-

guage code shown in the listing at right.

When you're finished, check your typing, then select File Save As. In the file type list, choose Ami Pro Macro. Type MAKEMAIL in the Filename field, then select OK and close the macro file. (If this tip leaves your E-mail in Times New Roman or a font other than Courier and you use Windows 3.1, substitute "Courier New" for "Courier" in the macro.)

To use the macro, create your document as usual, then select *Tools • Macros •* Playback, pick MAKEMAIL.SMM from the list, then select OK. Type a path and file name for your E-mail file at the prompt, and select OK when you see the ASCII Options dialog box. You can then upload the newly saved ASCII file with your communications or E-mail program. The lines will be the correct length for any E-mail system. If you'll use this macro often, save time by assigning it a shortcut key or adding it to the SmartIcon bar. —G. C.

71. Selecting an Entire Document

Ami Pro versions 2.0 and 3.0 lack a command to select the entire document. You can work around this missing feature by pressing <Ctrl>-<Bome>-Ctrl>-<Shift>-<End>. If you use this command frequently, it's worth recording as a macro. —G. C.

72. Multiple Frames in Ami Pro

If you use Ami Pro to create product catalogs, design business cards, or even just print mailing labels, you'll need to create the same frames over and over on the page. But why design each new frame from scratch? With Ami you can create one and insert as many copies of it as you need. Use the Frame command to create a new frame, then fill it with your text. Click once on the frame to select it, then copy it to the Clipboard using a SmartIcon or Edit • Copy. (If you've nested other frames inside the frame to be moved, you'll need to hold down <shift> and click on all the frames before copying them to the Clipboard.) Move the cursor to where you want to insert a copy of the frame and select Edit • Paste (or press

Shift>-(Insert>). You can then hold down **Shift>** while you drag the frame to any location on the page. The original will stay just where it was. —G. C.



WordStar for DOS and Windows 73. Partial Spelling Checks in WordStar 6.0 and 7.0

WordStar normally runs its spelling check from the beginning of the document. Often, though, you want to check spelling only from the current cursor position. Select Utilities • Spelling Other • Spell Rest or use the classic command < Ctrl>-QL. —G. C.

74. Multiple Docs in WordStar for Windows

Unlike most *Windows* word processors, *Wordstar for Windows* won't let you open multiple documents simultaneously. However, you *can* run more than one copy of the program to edit additional documents. On a typical *Windows 3.1* system with 4MB of RAM, you should be able to run three copies simultaneously, depending on how large the documents are. You can still cut and paste between documents via the *Windows* Clipboard. If you try this trick, though, be sure to close all other applications and save your work frequently to avoid problems. —*G. C.*

75. The Right Way to Align Text

If you've ever tried to get WordStar 6.0 to right-justify a header, you know it just about

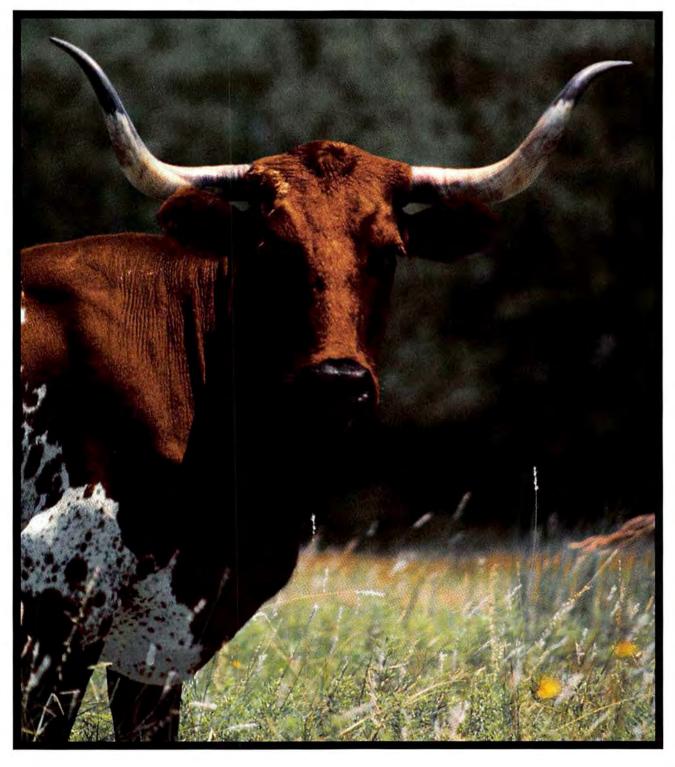
takes an act of Congress. The easiest way is, first type in the line you want right-justified without any dot commands. Then type <**Ctrl>0**] to justify the text. Then put the dot command .**HEO** at the start of the line. You can do the same thing with footers using the .**FO** dot command. —*Steve Bass*

Steve Bass, George Campbell, Robert J. Lauriston, Daniel Tynan, and John Walkenbuch are contributing editors for PC World; Christina Wood is an assistant editor. They can be reached on PC World Online (see page 8 for more information).

```
FUNCTION main()
Prompt$ = "Enter the path and file name for your Email file."
NoName$ = ""
MyFile$ = QueryS(PromptS, NoNameS)
IF MyFile$ = ""
        GOTO Quit
ENDIF
TYPE ("[CtrlHome]")
TYPE ("[ShiftCtrlEnd]")
FontFaceChange ("Courier")
FontPointSizeChange (12)
ImportExport(1, MyFileS, "ASCII", 0, "LINE", ASCII, 0)
FontRevert()
TYPE ("[CtrlHome]")
Quit:
END FUNCTION
```



NEW BREED



AND PUITHE OLD BREED OUT TO PASTURE.

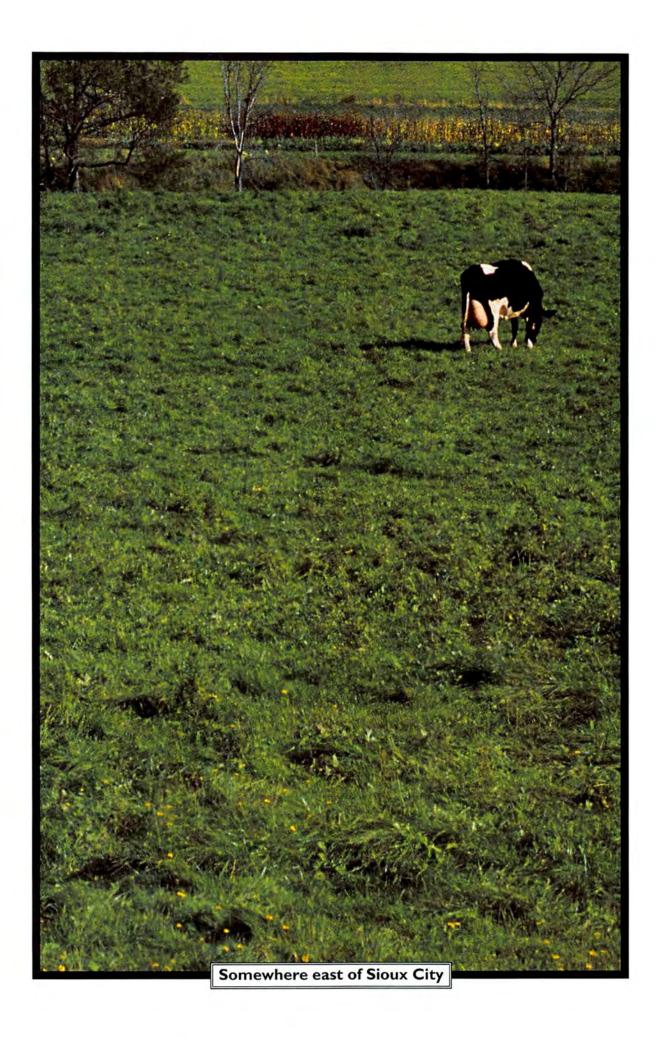
Every cow has its day. But it's time to put that milker out to pasture and make way for the Hyundai 486 stampede. It's time to Do Something New Breed®.

Say goodbye to "cow-shed" engineering and mother-board-of-themonth manufacturing. At Hyundai, we're doing *U.S.-based*, end-to-end, value engineering and manufacturing. That means benchmark-blasting power from the new Hyundai family of 486 Systems.

And with up to 32 Winmarks of Windows processing power, Hyundai's bulletproof, 32-bit 486 Systems are designed and engineered for your high-throughput applications. For instance, Local Bus Graphics are standard on every system, from our entry-level computers up through our top-of-the-line desktops. You'll tear through Windows with our razor-sharp, 32-bit processing. Plus, up to 32 Megapixels of mind-bending GUI acceleration is standard with every New Breed 486 from Hyundai. And here's more New Breed value engineering. Our expandable, "warpspeed" L2 cache architecture is standard on every Hyundai 486 system.

Made-in-America engineering excellence is coming through the gates with the backing of a global high-tech leader. Now Do Something New Breed. And turn the page....







486 STAMPEDE



That thunder you hear on the PC prairie is the New Breed Hyundai 486 stampede. The hardest-charging, price-lean, MIPS-mean herd of computers you'll ever see. We're bringing everything from powerful 66MHz 486DX2 machines to Overdrive-Upgradable 486SX-25 computers. And with our 50MHz 486DX2 desktop PC and 486DX-33 blasters, you can handle today's demanding applications.

WINMARKS 40 30 20 10 Standard HYUNDAI

VGA

Do something "Longhorn" Local Bus.

That flash you see on the graphics horizon is the image of our Windows processing power triggering the Hyundai 486 stampede.

Your 486 processor was meant to run today's applications. So why rein in all that power? That out-to-pasture, 16-bit VGA card can only deliver 2 Megapixels at best. That's already dated technology. Let her rip with 32-no-blink-bits of "Longhorn" *Local Bus video acceleration*. And with up to 32 Megapixels *standard*, believe it, you'll see an incredible difference in Windows performance.

Do something thunderbolt.

Lightning-fast "warpspeed" L2 caching is another max-performance feature that's designed into every Hyundai 486. Thunderbolt write-

back operations blast your DOS, Windows, or OS/2 data into a box canyon of ultra-fast SRAM. Start out with 128KB standard (more than the cow computers), then expand to 256KB to handle today's big applications. Cache hit for cache hit, the



Hyundai 486 Family, with 128KB standard caching, delivers twice the MIPS of non-cached cows.

Do something upgradable.

Local Bus

The Hyundai 486 New Breed Family is designed in Silicon Valley, U.S.A., to out-perform the herd.

All of our systems are *CPU-upgradable* through a single chip via a *ZIF or Overdrive socket*, so the New Breed lets you double your speed. We won't let tomorrow's 32-bit operating systems blast a hole in your productivity. Just upgrade your Hyundai 486 to any higher-speed Intel 486 CPU in the future.



486SX/33-\$1999

This Hyundai 486SX-33 can out-muscle those barnyard bovines of cow country. But you be the judge.

Our 32 Megapixel "Longhorn" Local Bus?... or a I Megapixel moo cow? Our "faster-than-a-blink" Windows accelerator video processing tied to the speed of your 486 CPU?... or an old-fashioned bottleneck? Our IMB VRAM controller producing I024 x 768 ultra-high, non-interlaced resolution?... or their tired cow VGA? Clearly, the prize goes to the Hyundai New Breed.

Compare our standard 128KB of zero-wait state cache with non-cached cows. And don't forget, the Hyundai

433S flexes its processing muscle up to 256KB of cache expansion. This system runs at the head of the stampede!

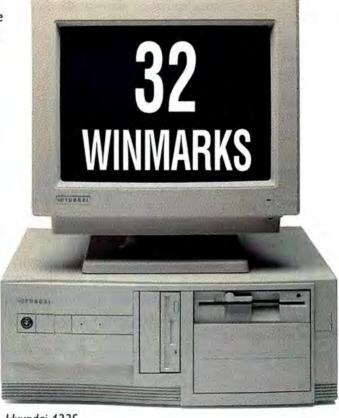
And we don't just drive the Hyundai stampede, we overdrive it! Double your speed by simply snapping in the Intel Overdrive™
Processor. And our advanced "warpspeed" L2 cache and "Longhorn" Local Bus graphics engine give your upgraded system the 32-bit video and fast SRAM

Add-In

Hyundai 433S

- 33MHz 486SX w/ 8KB integrated cache
 32-bit VESA local bus UVGA graphics
- w/IMB VRAM
 128KB "warpspeed" write-back 20ns
 SRAM L2 cache (expandable to 256KB)
- Upgradable to 486DX power via Intel "Overdrive" socket
- 4MB system memory expandable to 64MB on system board
- . 170MB 19ms IDE HDD, 32KB disk buffer
- 1.44MB 3-1/2" and 1.2MB 5-1/4" FDDs, (2.88MB-ready FDD interface)
- 14" non-interlaced, ultra-high resolution, .28 dot pitch, 72Hz refresh rate, flickerfree, color display w/1024 x 768 resolution, tilt and swivel base
- 25/1P, integrated PS/2 mouse port
- . 5 external drive bays, 2 internal
- 7 expansion slots, including 1 YESA local bus slot
- · 200 watt power supply
- 101 keyboard, 2 button mouse
- Built-in virus protection, front keylock,
 2 level password
- . MS DOS 5.0 and MS Windows 3.1

you'll need for your higher-speed 486 CPU.



Hyundai 433S

Want to talk add-ins? We test our 486 systems with literally hundreds of industry-standard cards and software applications. We test software compatibility on Novell (we're fully certified and a Novell Alliance Program member), Banyan Vines, 0S/2 2.0, LAN Manager, and SCO UNIX, plus hundreds of programs running under Windows and MS DOS.

Trouble on the data frontier? Relax. The Hyundai 433S is loaded. A beefy I70MB superfast hard disk, two floppy drives, five external/two internal drive bays, and seven expansion slots mean you won't go hungry for performance. And dressed up with our I4" flicker-free, non-interlaced, color display, the New Breed 433S is the new

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- · 30-day, no-risk, money-back guarantee on anything you buy direct from Hyundai.
- 48-hour turnaround on ship-in repairs.
- Beginners Help Line: 800-933-9917.

you get New Breed service from a world-

- Product spec fax: 800-723-4843.
- · 7-days-a-week tech support:
 - -24-hour lifetime tech support: 800-289-4986.
 - -24-hour tech fax: 800-283-4986.
 - -24-hour tech bulletin board: 800-955-5432.
 - —Tech support through CompuServe access.



Hyundai 466D2TE **New Breed Power Server**

- · 66MHz 486DX2 CPU w/8KB integrated cache
- · 128KB high-speed L2 cache
- · 32-bit EISA architecture
- 8MB RAM standard (expandable to 32MB on system board and 96MB via memory expansion board)
- · 32-bit caching SCSI host adapter
- . 360MB 12ms SCSI HDD, 256KB disk buffer
- I.44MB 3-1/2" and I.2MB 5-1/4" FDDs
- · SVGA graphics card
- · 14" interlaced, ultra-high resolution, flickerfree, color display with 1024 x 768 resolution, .28 dot pitch, 72MHz refresh rate
- . Seven 32-bit EISA slots, one ISA slot
- . 5 external and 2 internal drive bays
- . 300 watt power supply
- · Built-in virus protection, front keylock, 2 level password
- · 101 keyboard, 2 button mouse
- . MS DOS 5.0 and Windows 3.1



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Hyundai 425S

- 25MHz Intel 486SX w/8KB integrated cache
- 32-bit VESA Local Bus UVGA graphics w/IMB VRAM
 128KB "warpspeed" write-back 20ns SRAM L2 cache (expandable to 256KB)
- Upgradable to 486DX power via Intel Overdrive
- 4MB system memory expandable to 64MB on board
 80MB 17ms IDE HDD, 32KB disk buffer
- 1.44MB 3-1/2" and 1.2MB 5-1/4" FDDs

- . 14" non-interlaced, ultra-high resolution, .28 dot pitch, 72Hz refresh rate, flicker-free, color display w/1024 x 768 resolution, tilt-and-swivel base
- · 25/1P, integrated PS/2 mouse port
- 5 external drive bays, 2 internal
- 7 slots incl. I VESA Local Bus slot
- · 200 watt power supply
- · 101 keyboard, 2-button mouse
- . Built-in virus protection, front key lock, 2 level password
- . MS DOS 5.0 and MS Windows 3.1
- . Other hard drive, video, memory, and monitor options available



Hyundai

- . 33MHz Intel 486DX w/8KB integrated cache
- 32-bit YESA Local Bus UVGA graphics w/IMB VRAM
- 128KB "warpspeed" write-back 20ns SRAM L2 cache (expandable to 256KB)
- Processor upgradable via ZIF socket
- 4MB system memory expandable to 64MB on board 200MB 12ms IDE HDD. 256KB disk buffer
- 1.44MB 3-1/2" and 1.2MB 5-1/4" FDDs
- 14" non-interlaced, ultra-high resolution, .28 dot

- pitch, 72Hz refresh rate, flicker-free, color display w/1024 x 768 resolution, tilt-and-swivel base
- · 25/1P, integrated PS/2 mouse port
- · 5 external drive bays, 2 internal
- 7 slots incl. I VESA Local Bus slot
- · 200 watt power supply
- · 101 keyboard, 2-button mouse
- · Built-in virus protection, front key lock, 2 level password
- . MS DOS 5.0 and MS Windows 3.1
- · Available in floor-standing server model as 433DT, call for price
- · Other hard drive, video, memory, and monitor options available



Hyundai 450D2

- . 50MHz Intel 486DX2 w/8KB integrated cache
- 32-bit YESA Local Bus UYGA graphics w/IMB YRAM
 128KB "warpspeed" write-back 20ns SRAM L2 cache (expandable to 256KB)
- Processor upgradable via 21F socket
- 8MB system memory expandable to 64MB onboard
 200MB 12ms IDE HDD, 256KB disk buffer
- 1.44MB 3-1/2" and 1.2MB 5-1/4" FDDs

- . 14" non-interlaced, ultra-high resolution, .28 dot pitch, 72Hz refresh rate, flicker-free, color display w/1024 x 768 resolution, tilt-and-swivel base
- · 25/1P, integrated PS/2 mouse port
- · 5 external drive bays, 2 internal
- . 7 slots incl. I VESA Local Bus slot
- · 200 watt power supply
- 101 keyboard, 2-button mouse
- · Built-in virus protection, front key lock, 2 level password
- . MS DOS 5.0 and MS Windows 3.1
- . Other hard drive, video, memory, and monitor options available



Hyundai 466D2

- · 66MHz Intel 486DX2 w/8KB integrated cache
- 32-bit VESA Local Bus UVGA graphics w/IMB VRAM
- 128KB "warpspeed" write-back 20ns SRAM L2 cache (expandable to 256KB)
- · Processor upgradable via ZIF socket
- 8MB system memory expandable to 64MB on board
- 360MB 12ms IDE HDD, 256KB disk buffer
- . 1.44MB 3-1/2" and 1.2MB 5-1/4" FDDs
- . 14" non-interlaced, ultra-high resolution, .28 dot

pitch, 72Hz refresh rate, flicker-free, color display w/1024 x 768 resolution, tilt-and-swivel base

- · 25/1P, integrated PS/2 mouse port
- 5 external drive bays, 2 internal
 7 slots incl. I VESA Local Bus slot
- · 200 watt power supply
- · 101 keyboard, 2 button mouse
- · Built-in virus protection, front key lock, 2 level password
- . MS DOS 5.0 and MS Windows 3.1
- · Available in floor-standing model with ISA architecture as 466D2T, call for price
- · Other hard drive, video, memory, and monitor options available

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Number of PCs in	your current site	Brands yo	ou have standar	dized on		
Other brands you	are considering					
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Tell us about you	r targeted system cor	figuration				
CPU Type	□ 486	☐ 486SX	☐ 386DX	☐ 386SX	☐ Notebook	
Architecture	☐ ISA	☐ EISA				
Memory	MB installed	Cache Memory	/ ☐ 128 KB	☐ 256KB		
Floppies	☐ 1.44MB 3-1/2"	☐ 1.2MB 5-1/4"				
Hard Disks (IDE)	☐ 100MB	☐ 120MB	☐ 200MB	☐ 250MB	☐ 330MB	☐ 500ME
(SCSI) 3.5"	☐ 360MB	☐ 540MB	☐ 1.2GB			
5.25"	☐ 330MB	☐ 760MB	☐ 1.6GB	☐ 2.0GB		
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When you have an important story to tell, you better make sure you have enough room to tell it all. Unfortunately, most printers make you confine your message to an 8½" x 11" piece of paper.

That's not the case with LaserMaster's WinPrintTM products. LaserMaster makes a complete line of WindowsTM printers and printer upgrades that let you print your work on paper up to 17" x 22" and with resolutions up to 1200 dpi. Now you can be sure that the world understands your *entire* message!

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Fast Windows printing. Just because it's big doesn't mean it has to be slow. Like all the WinPrint

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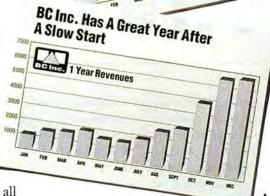
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products, the WinPrinter 600xL offers the industry's fastest Windows printing speeds.

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Windows Fax Soft

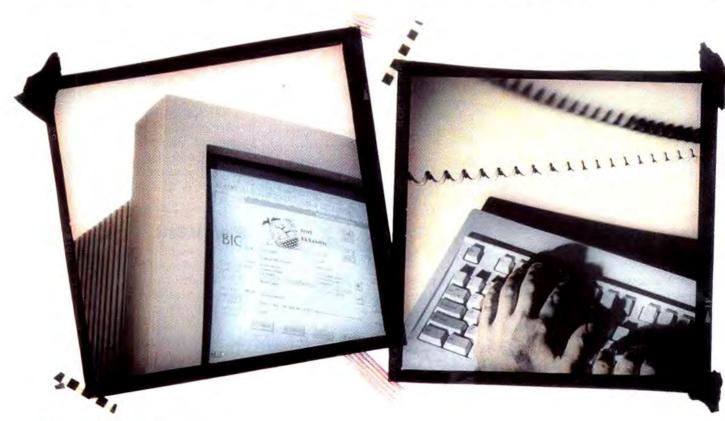
ith their point-and-click convenience, *Windows* fax programs make faxing from your PC easier than ever. You can prepare a fax message within an application, pop up a fax dialog box, select a destination, have the cover sheet automatically filled in, and send it off while you get back to work. When you get a reply fax, it's captured in the background as you continue to type away. You can then read the fax on screen or send it to your printer.

This sounds like the ideal way to communicate by fax—and when it works, it's close. In fact, you'll find that the biggest headache is getting the programs to work with your fax-modem. Confronted with a hodgepodge of fax conventions—Class 1, Class 2, CAS, and

Sierra Sendfax—we learned the hard way that while a fax-modem and a fax program may claim to support the same conventions, they won't necessarily work together (see "Considering Hardware").

Once you've resolved the technical glitches, what really counts is whether a program makes it easy to send and receive faxes. To help us evaluate ease of use, we invited nine *PC World* subscribers to test the seven *Windows* fax programs available at press time that were designed to work with a variety of fax-modems. All our panelists were business professionals who knew their way around *Windows*, but none had ever used a fax program.

We gave each panelist 1 hour with each program. Their mission: to send and receive a single-page text document in the background



COMMUNICATIONS FAX SOFTWARE

Ware

With a fax-modem and the right software, your PC can have all the power of a fax machine—and more. With help from a panel of business users, we review seven Windows fax packages and come up with a clear winner.

while working in *Microsoft Word for Windows*. Since ease of use is paramount in fax software, the panelists' ratings accounted for half of each program's evaluation score. The remainder of the scoring was based on performance (how invisibly a program operates in the background) and feature set.

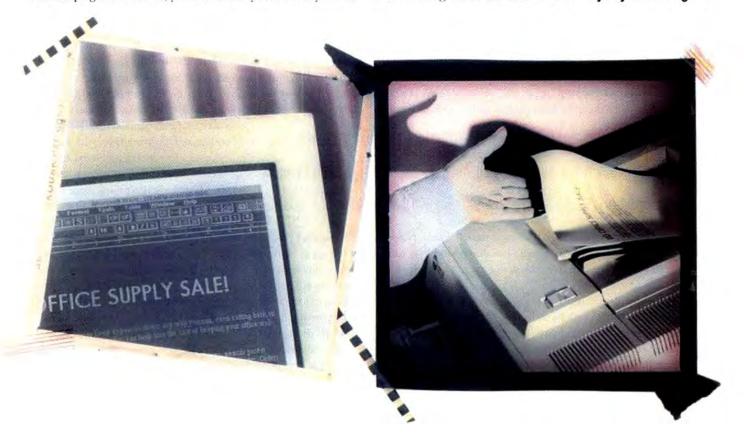
We found that the programs vary greatly on all three counts, particularly ease of use. Although some were a breeze, the panelists had to wrestle heroically with others. They discovered many advantages fax software has over fax machines, along with a few drawbacks: Sending and receiving faxes in the background will usually slow your foreground application, although that varies depending on the fax program. Moreover, you'll need to buy a scanner if you want

to fax paper documents. And unless you buy a phone-activated power-up device, your PC must remain switched on in order to receive faxes when you're not there.

Some of the panelists commented that with traditional fax machines it was easy and natural "to just stick the pages in the tray and dial the number." But all agreed that if you create the documents you fax on a computer, you can't beat the convenience of a good fax program.

Intel's Faxability Plus/OCR is the clear winner in our roundup. It has a comparatively modest feature set, but it performed flawlessly in the background and was our panelists' overwhelming choice for ease of use.

By Bryan Hastings



COMMUNICATIONS FAX SOFTWARE

Delrina's WinFax Pro was the runnerup, offsetting a lackluster showing in the ease-of-use category with outstanding marks for features and performance. Eclipse's Eclipse Fax came in a strong third, with a powerful set of fax viewing and editing tools.

Facts on Fax

By putting the fax programs through real-world usability tests with nine businesspeople, we were able to pinpoint the most significant features you should consider when buying a fax program. For details, turn to the Features Comparison at the end of this article.

Sending and Receiving Faxes

Fax programs offer so many features that fax machines don't, it's hard to know where to start. Send and receive fax logs automatically track what has come and gone and what's scheduled to go. A fax program's phone book lets you enter frequently called names and fax numbers and attach extra information, such as a phone number, company name, and comments. All the programs we tested, except Bit Software's BitFax/OCR, let you create multiple

phone books for organizing related numbers, such as those for personal and business use. All offer some kind of search mechanism: by name, by company, and so on. And all the programs, except Sofnet's *Faxit*, provide a way to import database records into the phone book, export phone book records to a database, or both. Importing and exporting capabilities are enormously useful for companies that want to keep all their contacts' address and phone infor-

Fax programs forward legible faxes. With standard fax machines, you must photocopy a fax before retransmitting, and reading such faxes is like deciphering street signs through a fogged car window.

mation in a central location, so they can update all records from a single database. *BitFax/OCR*, Caere's *Fax Master*, and *WinFax Pro* make this even more convenient by storing the phone book records in *dBASE* format.

Another feature exclusive to fax programs is easy group faxing. Anyone who's put up with squawks from the mailroom when sending more than a dozen faxes will love this feature—you can send the same fax to a long list of people at the click of a mouse button. In most programs the group fax feature automatically fills out the cover sheet by pulling the necessary information out of the phone book. The most exciting development in group faxing is fax merge, available in Delrina's and Eclipse's programs. Like mail merge, fax

Best Buy



Intel's Faxability Plus/OCR 1.0 took the top prize in our roundup. Our test panelists raved about how easy it was to learn and

use. The program's performance is also outstanding: When sending and receiving faxes in the background, it leaves the foreground application virtually undisturbed. Both these advantages outweigh the fact that the program lacks some useful features, such as landscape viewing and an image editor.



merge lets you automatically insert unique information in a fax document for each recipient in the group.

Do you need to forward faxes? With a standard fax machine, you must smooth out the curled-up paper and photocopy it before retransmitting, and reading such faxes is like deciphering street signs through a fogged car window. With fax software, the faxes remain in electronic form, so there's little to no degradation of image quality. The Eclipse program even lets you set up a phone number where you can automatically forward faxes, in case you're away from the office but at another fax-equipped site.

Fax programs also match most of the advanced features of fax machines. Most support transmission scheduling (which lets you set a delayed transmission time to take advantage of low phone rates), and some provide speed dial and the capability to interrupt a phone call to send or receive a fax. This last feature is especially useful for portable-PC users, who are often faxing from hotels and other sites where they're forced to go through a switchboard.

Most programs allow you to splice different documents, such as an Excel spreadsheet and a Word memo, into one fax.

Like regular fax machines, fax programs allow you to send and receive in standard mode (200 by 100 dpi) and fine mode (200 by 200 dpi). The usual trade-off applies: Standard-mode faxes take less time to transmit and receive and occupy less room on the hard disk, but the higher-resolution faxes are easier to read and produce fewer

optical character recognition (OCR) errors.

Sending and receiving faxes with a computer poses a few special problems. One is the need to preview the fax before transmitting it, a feature we don't think twice about with a conventional fax machine. Only four of the reviewed products let you preview a

fax. Another problem is viewing faxes that arrive upside down, or sideways as in the case of spreadsheets. You *could* print them out (all the programs allow this with a *Windows*-compatible printer), but you may not want to waste time and paper. Instead of forcing you into an unnatural viewing position, all the programs, except Sofnet's *Faxit*, let you flip an upside-down fax. Only the Intel and Sofnet products don't allow you to turn a spreadsheet sideways.

The capability to print a received fax is both a boon and a bane. You get hard copy that looks better than what comes out of a fax machine—but you have to wait at least 1 to 2 minutes per page. Four of the fax programs offer automatic printing for received faxes, which is especially handy for faxes that arrive after work hours.

Fax Management

Another problem with PC faxing is disk space: You can fill a hard drive with faxes in no time. When you send a fax document, a bit-mapped image of the document is created that may require 15K to 20K per page for a simple text page, and up to 200K or more for a page with detailed images. To help you avoid unwelcome 'Disk Full' messages, the Delrina, Intel, and ZSoft programs give you the option of automatically deleting faxes after they're sent. Delrina's product also lets you set a delete timer for received faxes you've already viewed. Four of the programs offer fax storage that compresses fax images to a fraction of their original size.

If you prefer to save a tree and view faxes on screen, you'll appreciate some advanced viewing features. Not only do all the programs let you zoom out to see the whole page, some let you choose an area of the fax to magnify. Some also let you display thumbnails of multipage documents. Some programs even have an antialiasing feature, which makes a fuzzy or low-resolution fax more readable.

Fax annotation is one of the hottest new features. The Delrina, Eclipse, and ZSoft programs include image editors for marking up the displayed fax, which you can then retransmit. If you want to edit the fax in another graphics editor, such as ZSoft's PC Paint-

Anyone who's put up with squawks from the mailroom when sending more than a dozen faxes will love the group faxing feature.

brush, all the programs let you convert the fax to PCX format. Most also support TIFF, DCX, and standard bit-mapped formats (BMP).

Once you've converted the fax to another file format and edited it, the fax program has to reconvert it into a fax to resend it. Only ZSoft's *Ultrafax* lets you attach a binary file to a fax, as long as the recipient has the same program on the other end to "unwrap" the file. This situation is changing, however; it's likely that most fax software will conform to the binary file transfer protocol approved by the CCITT and the EIA, which will simplify the transfer of binary files between fax programs.

All the reviewed programs, except *Eclipse Fax* and *Faxit* (which will have OCR versions close to the time you read this), will let you convert the fax to editable text using optical character recognition (see "Fax and Text Files: A Marriage Made in OCR"). Four of the programs also invert the fax, or convert a "negative" image (white type on a black background) to a "positive" image (black type on a white background). This is ideal for lawyers and other professionals who need to fax microfilm photocopies that they've scanned into a portable computer using a hand scanner.

Only the Bit Software and Sofnet programs lack scanner support. The Caere and ZSoft products work with dozens of scanners, the Eclipse software works with three, and the Intel and Delrina programs support TWAIN, a standard promoted by a coalition of scanner companies including Caere, Kodak, and Hewlett-Packard.

Setup

With all the extra features they pack in, five of the fax programs we reviewed commandeer 5MB or more of your hard drive. In case you don't want to use all these features, Delrina's WinFax Pro and

low They Rate	performance (out of 10)	Ease of use
Bit Software BitFax/OCR for Windows 2.05	2.5	33.1
Caere Fax Master 1.01	2.5	26.6
Delrina WinFax Pro 3.0	8.4	30.1
Eclipse Fax 1.2	3.3	31.6
Intel Faxability Plus/OCR 1.0	9	40,3
Sofnet FaxIt 2.15e	7.5	36.7
ZSoft Ultrafax for Windows 1.0	5	22.2

¹The system used for our performance tests was the Compaq Deskpro 486s/25M with 8MB RAM, Intel SatisFaxtion Modem/400e, and Microsoft Excel 4.0.

Intel's Faxability Plus/OCR 1.0 is the overall champ, with a winning combination of best performance and ease of use.

More Windows Fax Products

The following Windows fax products didn't meet our roundup requirements or shipped too late for our review, but we believe that they're worth noting.

We received three Windows fax programs that weren't compatible with any of our three test modems. The first program, The Fax Window 3.0 (\$119 from Frecom Communications; Fremont, CA; 408/955-0555), which was supposed to work with any Class I or Class II modem, has several features that caught our eye.

Most interesting was the ComPort utility that lets you jump between the fax program and any data communications program, such as *Procomm Plus*, without shutting down and then reloading the fax program. (This feature is useful because it's easy to forget to reload the fax program after completing your Email tasks.) Frecom also adds a Send Fax menu item in the File menu, so you don't have to change the active printer driver when alternately using the fax-modem and the local printer.

The other two programs were SuperFax 5.0 (\$99 from Pacific Image Communications; Alhambra, CA; 818/457-8880) and TransFax for Windows 2.0 (\$189 from TransFax Corporation; Culver City, CA; 310/641-0439). At press time both vendors confirmed the programs worked with only a few modems. SuperFax supports Class I and Class II and offers Dynamic Data Exchange (DDE) links to other Windows programs. TransFax Is a CAS-only program designed to accommodate multiple fax lines to a single computer for users who do high-volume faxing.

Other Programs to Watch

Stand-alone Windows fax programs that weren't available for review but should be available when you read this: Smith Micro's Quick Link II Fax for Windows (\$49 from Smith Micro; Huntington Beach, CA; 714/362-5800), MicroPhone Pro II (\$195 from Software Ventures; Berkeley, CA; 510/644-3232), Phoenix Fax for Windows (\$99.95 from Phoenix Technologies; Norwood, MA; 617/551-4000), and Datafax (\$129 with OCR from Trio Information Systems; Raleigh, NC; 919/846-4990).

COMMUNICATIONS FAX SOFTWARE

ZSoft's *Ultrafax* offer a partial installation option, bringing their space requirements down to 2.5MB and 3MB, respectively.

Once you've successfully matched up a fax-modem with your software, most programs can determine during installation which fax convention your modem uses and automatically adjust to it. WinFax Pro and Ultrafax also figure out which COM port your modem is plugged into and set the software to it. WinFax Pro even creates a file that details the installation process, which helps tech support quickly pinpoint installation problems.

Bryan Hastings is an associate editor for PC World. He can be reached on PC World Online (see page 8 for more information).

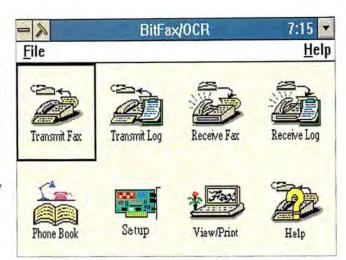
Bit Software: BitFax/OCR for Windows 2.05

PROS: Straightforward interface, very good OCR

CONS: Disappointing background operation, lean on features

Bit Software's DOS-based communications software has a reputation for being low budget, so we didn't have great hopes for the company's latest product for *Windows*. But the panelists were pleasantly surprised that, although *BitFax/OCR* is an economy model, it's easy to work with.

BitFax/OCR's setup is simple and thorough. You can choose from an unusually wide range of four fax speeds from 7200 to 14,400 bps. If you want, BitFax/OCR can automatically begin waiting for faxes



INFORMATIVE ICON GROUP: BitFax/OCR's collection of eight icons makes it easy to find the functions you need.

and restart the scheduled send-fax queue each time Windows is loaded. The few times our panelists had to refer to the manual, they appreciated its completeness and solid organization.

Eight icons open windows for fax transmission, fax receive, phone book, and other basic functions. When you're sending or receiving a fax, an informative status box pops up, but you can choose to switch this box into the background and return to work. We found this to be one of the best-organized interfaces and very useful for the newcomer. Only one panelist complained that she had to spend time to get the program to work.

The highlight of BitFax/OCR is its OCR component, which is

Why Not a DOS Fax Program?

If you do most of your work in Windows, a Windows-based fax program is the natural choice. If you use Windows and DOS, a Windows fax program is still the better pick. The reasons don't reflect poorly on DOS fax programs, but rather on the limitations of DOS.

DOS fax programs demand a lot of user attention. First you have to make sure the program supports your local printer. DOS fax programs also require at least one TSR (terminate and stay resident) program—an often cranky piece of code that lurks in RAM and is a common culprit in system crashes. If you are already using a TSR, you'll have to edit your AUTOEXEC.BAT file to rearrange the TSRs in a specific loading order, or else your system can lock up on bootup.

Faxing with a DOS program can be as involved as setting up the program. When you want to send a fax from within an application, you have to manually invoke the TSR with a hot key before using the Print com-

mand to send the fax. If you're in a DOS graphics program, however, chances are you'll have to close it before faxing, since many DOS fax programs won't pop up over it.

Windows fax programs take much of the pain out of setup and use. Since printer sup-

Since printer support is already built into Windows, a Windows fax program is guaranteed to work with your printer.

port is already built into Windows, the fax program is guaranteed to work with your printer. To send a fax from within an application, you need only print to the fax-modem.

Unfortunately, if you hop back and forth between Windows and DOS, you still need at least one TSR if you want to receive faxes at all times. Delrina, Eclipse, and Intel supplement their Windows programs with TSRs

that let you receive faxes when working in a DOS application. If you use DOS applications within *Windows*, you can still receive faxes with a *Windows* fax program. To send faxes, however, we recommend you save the DOS file in a format you can import into the ap-

propriate Windows application before faxing.

Finally, sophisticated features such as OCR and advanced image editors and viewers are missing from most DOS fax pro-

grams. These extras require the kind of hard disk, RAM, and processing power typically associated with Windows-ready computers.

If you use only DOS, you can pick from plenty of good fax programs that are based on that operating system. If you use Windows at all, however, you'll find that flexibility and ease of use make a Windows fax program the clear choice.

Caere's sophisticated Anyfax software. Anyfax is unusual in that it handles low-resolution text almost as well as high-resolution text—a big advantage, since the majority of faxes are sent in low resolution to save transfer time and expense. The trade-off? Anyfax is very slow: It takes 2 to 3 minutes to convert a low-resolution file, and Windows slows down too much to allow effective work.

Anyfax hosts an impressive set of features. When a fax arrives, you can recognize the current page, selected pages, or only a portion of a fax, which saves OCR time. You can choose from dozens of output text file formats, a large number of page layout options, and a land-scape or upside-down orientation for the original fax. You can even optimize recognition for any one of 11 languages. If you want to edit the text file immediately after recognition, the Launch option opens your word processor and loads the file.

Although *BitFax/OCR*'s ease of use and OCR are big pluses, these are outweighed by the program's limitations. First, it freezes the foreground application for up to 10 to 15 seconds during *handshakes* (when the modems exchange vital information between fax pages). Also, if your computer has less than 8MB of RAM, the program demands 4MB of contiguous hard disk space, which is treated like RAM, and processing speed slows down precipitously.

Another complaint is the program's lack of more advanced features, such as fax indexing (this allows you to attach a name longer than eight characters to a fax, file it in a folder, and archive it), image-editing tools, and thumbnail viewing. Also, you have to create

Fax Master's forte is its OCR proofreading system. Its spelling checker corrects misspelled words on the OCR'd document, and you can pop up sections of the original fax for instant proofreading.

a group before you can send a group fax (instead of picking a list on the fly from the phone book), and the groups are identified only by numbers. It would have been nice to have some kind of incoming fax alert.

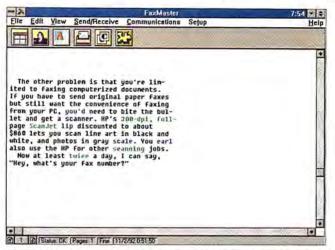
Although BitFax/OCR is reliable and easy to use, we can't recommend the program given its less-than-desirable performance and basic feature set. Besides, if what you're looking for is a bare-bones but easy-to-use program, Sofnet's Faxit is a better deal. The current version lacks OCR, but it offers superior performance and costs almost the same as BitFax for Windows without OCR.

BitFax/OCR for Windows 2.05, Bit Software; 510/490-2928, 510/490-9490 (fax). List price: \$129, BitFax for Windows 2.0 without OCR \$79. Reader service no. 690

Caere: Fax Master 1.01

PROS: Very good OCR and proofreading system
CONS: Poor performance, hard to use, average feature set

When Yogi Berra said, "It's déjà vu all over again," he could have been talking about Caere's Fax Master. Several panelists wondered if it was the same program as BitFax/OCR. It didn't take long to discover that Caere and Bit made a technology trade: Fax Master incorporates the BitFax 2.01 send-fax engine, and BitFax/OCR 2.05 has Caere's Anyfax OCR engine.



SPELLING CHECKER: Caere's Fax Master not only turns your fax into a text document, it highlights corrected words in one color (blue here) and suspected misspellings in another (green)—but it isn't perfect.

Even so, Fax Master wasn't the equal of BitFax/OCR in our overall evaluation. Disappointment set in at installation. We discovered a quirk in using Fax Master with our Intel SatisFaxtion 400e test modem: To get Fax Master to work, we also had to install Intel's SatisFaxtion and Faxability software. None of the other programs we reviewed required Faxability as an adjunct. Another problem

was the poorly organized user manual, with setup steps listed in the wrong order.

Things didn't improve much after the program was set up. Several panelists found the interface confusing. One example of the interface's poor organization is that the tools for manipulating an OCR version of a fax

were spread throughout three menus. Panelist Greg Immel echoed our criticism of *BitFax/OCR*'s group fax control: Like that program, *Fax Master* doesn't let you create a recipient group on the fly.

Fax Master has some useful features, such as a speed-dial button and the capability to zoom, flip, and turn faxes sideways. But it lacks features common to better fax programs, such as an image editor, a fax previewer, antialiasing, and the capability to frame an area to zoom. Performance was another problem. In our tests on the Intel 400e modem, Fax Master tied for last place in performance because the foreground application slowed or stopped completely while Fax Master was transferring a fax in the background.

Fax Master's forte is its Anyfax OCR software and its OCR proofreading system. When you begin to edit a new text file in Fax Master's mini word processor, which is tailored for editing OCR text, the automatic spelling checker highlights in different colors words it has corrected and those it suspects are misspelled. To further assist proofing, you can double-click on a highlighted word, and a verification window will pop up over the OCR'd text, showing the relevant area of the original fax image for comparison.

Although Fax Master's OCR proofreading tools are useful, this advantage is overshadowed by the program's so-so feature set, its problematic performance, and its poorly organized interface and documentation.

Fax Master 1.0, Caere Corp.; 800/643-3915, 408/395-7000, 408/354-2743 (fax). List price: \$149. Reader service no. 691

COMMUNICATIONS FAX SOFTWARE

Delrina Technology: WinFax Pro 3.0

PROS: Packed with features, excellent background performance

CONS: Difficult to learn

Delrina's WinFax Pro 2.0 has been popular as one of the few Windows fax programs available until recently. Version 3.0 outpaces its predecessor with a potent mix of features and performance. In fact, these aspects of the program are so outstanding that they outweigh our panelists' low ranking for ease of use. While one panelist allowed that WinFax Pro was "fairly straightforward," several remarked on how hard it was to use.

If you decide that powerful features and performance are your highest priorities, then WinFax Pro 3.0 is your program. It comes replete with advanced fax viewing and editing tools, Caere's Any-

fax OCR engine, an advanced phone book, and sophisticated fax document management. It also has a 101-page library of sample cover sheets that you can customize. And WinFax Pro 3.0's performance rates second only to Intel's Faxability Plus/OCR in smooth background operation.

Delrina has certainly gone the extra mile with features. For example, the fax-viewer's zoom lets you place a box of fixed size over the precise area you want to enlarge; it also lets you fit ten fax pages to a screen for thumbnail viewing. Not only can you flip pages upside down, you can flip all the pages in a multipage fax at once. (Our only complaint is that the page rotation feature is very slow.) The image editor comes with a full complement of tools and lets you save your changes to a separate overlay file instead of having to permanently merge them into the original fax. Text annotation is done using a full text editor with word wrap, a dozen typefaces, various text styles, and justification tools.

Besides letting you create groups and multiple phone directories, the phone book manager can exchange records with databases and store its records in *dBASE* format. Most impressive is the capability to directly attach an external database to *WinFax Pro*, which means you don't have to update the phone book from the company database each time you want to send faxes to a large group. If you

File Onlines Window Help

Cover Page Library (CONGRATS.CVL)

Cover Pages

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Library

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COVER SHEET LIBRARY: Delrina's WinFax Pro 3.0 sports 101 cover sheets that you can edit easily. choose to use the phone book as a database, however, you'll find a healthy range of fields. Globe-trotters will love the extensive prefix and suffix options for phone numbers, which include international and country codes.

Do you often need to collect files from different applications to send together as a fax? If so, you'll appreciate WinFax Pro 3.0's strong document collection features. You can keep files individually or in folders and use a search function to find them. For easy access, you can organize any fax using a thumbnail display. You can also preview attachments before adding them and remove them if you change your mind before the fax goes out.

Delrina uses Caere's Anyfax OCR engine, and it differs little in performance from the Bit and Caere OCR systems. Delrina has the same special text recognition and proofing features found in Caere's Fax Master. WinFax's advantage is that you can call up the proofing

If you decide that powerful features and performance are your highest priorities, then WinFax Pro 3.0 is your program. It comes with advanced fax viewing and editing tools, and more.

window that shows the original fax at any time, not just when you highlight a misspelled word, as in Caere's product.

WinFax Pro's disappointing lack of intuitive operation is certainly a minus when first learning the program, but if you're willing to accept a steeper learning curve, the payoffs with WinFax Pro are strong performance and an impressive feature set. WinFax Pro 3.0 was runner-up in our overall evaluation.

WinFax Pro 3.0, Delrina Technology; 800/268-6082, 416/441-0774, 716/855-3676 (U.S. only), 416/441-0774 (fax). List price: \$129. Reader service no. 692

Eclipse: Eclipse Fax 1.2

PROS: First-rate fax viewing and editing tools

CONS: Slows foreground application during fax send and receive

Eclipse is a small start-up that touts its admirable mission to save trees by creating the paperless office. But we couldn't help wondering: Would *Eclipse Fax* match up to the heavyweights?

We were in for a surprise. The program did respectably well in the ease-of-use test, with most panelists awarding it decent if not top marks in that category. Phyllis Goldman called it "fairly intuitive, with good status dialog boxes," and Cliff Lawson liked how easy it was to set up group faxing. But where Eclipse really shines is in its feature set. Although at press time it lacked OCR (an OCR version should be shipping soon with the Ocron OCR technology), Eclipse Fax has a powerful fax viewing and editing system, especially for managing multipage faxes. In fact, Eclipse Fax turns out to be the sleeper of this roundup.

The program works its magic through three tool bars, which are a series of icons you can click on as alternatives to menu commands. The View tool bar allows you to rotate faxes, "best fit" them on screen (to see the whole fax in as large a size as possible), jump to any page in a multipage fax, forward the displayed fax to another fax machine, and view two nonconsecutive pages. Want to quickly



IMAGE EDITOR: Eclipse Fax lets you place text on a fax at an angle, handy for margins and other tight spots.

page through the fax? The Quick Read buttons enable you to page through the fax a half-page at a time.

Using the Edit tool bar comes closer to the convenience of marking by hand on paper than any of the other fax programs. You can add lines, ellipses, and rectangles or use a freehand drawing tool. You can also place text onto the fax at any angle—ideal for adding vertical lines of text on margins.

Eclipse Fax's Thumbnail tool bar lets you work with miniature versions of fax pages; simply click on file names to add faxes to the thumbnail display. Another tool permits you to organize the fax pages in the proper order and send them as a single fax. The screen repaints almost instantly when switching to a new fax page because pages are displayed in a rough "draft" version. The Clearview option lets you see a sharper image of a fax.

We found that making those inevitable last-minute changes, such as adding a prestored signature on the cover sheet or attaching a spreadsheet to a memo, is particularly easy with *Eclipse Fax*. You can also give faxes meaningful file names, because the Index feature allows up to 50 characters per name.

Pleasant surprises pop up throughout this program. You can begin a fax transfer during a current call (except when using a CAS modem). You can save time by specifying and printing only the area of a fax that you need. And if you jump between DOS and Windows, you'll be glad to know you can receive faxes in DOS through the aid of a TSR program. This is not a full DOS product, however, since you can't send faxes from DOS.

Eclipse Fax's biggest drawback is its relatively slow performance. The foreground application froze for long periods before and after a

Fax and Text Files: A Marriage Made in OCR

If you've longed to be able to receive a fax and open it up in your word processor, the wait is over. Optical character recognition (OCR) software, now built into most Windows fax packages, can turn those graphics-based files into ordinary ASCII text.

All the reviewed programs except *Eclipse Fax* and *Faxit* come with OCR (and both of those have OCR versions due

out by the time you read this). While standalone OCR packages have been available for years, they won't necessarily work with all fax packages.

The Real-World Test

OCR sounds like magic, but in fact many things can wreak havoc with the translation process: the varying fonts and point sizes of characters, line spacing, skew (the slight right or left angle at which the fax document was sent), and even phone-line noise that adds black dots to the fax at random. Also, nontext images such as photos, as well as multiple text columns on a page, can confound some OCR systems.

The developers of the top OCR systems claim 99 percent accuracy in ideal conditions. With faxes, that would include large type, no line noise, and a high-resolution fax. But that 99 percent figure still means 60 mistakes per 1000-word page. In real-life use, the number of errors is much greater. The

Even the best OCR packages still require you to proof what you scan.

fact is, even the best OCR packages still require you to proof what you scan. Caere and Delrina have added proofreading tools to their programs' OCR systems, including a spelling checker and a small window showing the matching piece of the original fax so you can compare the words in question.

The bottom line on OCR: If it's accurate enough that scanning and proofing the fax take less time than retyping it, it's worth consideration. To determine the accuracy and speed of built-in OCR, we devised a pass/fail accuracy test based on three types of documents, and measured how long each OCR system took to convert the text in each document. We expected the first document to be relatively easy to recognize. The print was dark, and the typeface was a relatively large

sans serif font. The next one had smaller, lighter, serif type, which can be more difficult to convert into text. The third was a photocopy of a newspaper article, with small, fuzzy type packed tightly together, making it still more challenging for the OCR system.

Best of the Bunch

Since the Caere, Delrina, and Bit programs use Caere's Anyfax system, all the programs successfully recognized the text in all three documents with little variation in performance times. Intel's Faxability Plus/OCR, which incorporates Calera's Wordscan 1.1, also passed the test on all three documents and beat the first three programs handily in the speed tests. ZSoft's Ultrafax, using the Ocron OCR system, had the fastest recognition times but tripped up over the newspaper article. The winner is Intel's Faxability, which performed best overall in the speed and accuracy tests.

If you already own Delrina's WinFax Pro 2.0 or Sofnet's Faxit, you can add OCR using Calera's Faxgrabber (\$149 from Calera Recognition Systems; Sunnyvale, CA; 408/720-8300). Faxgrabber will also translate any faxes in the PCX format.

There Is In In In





TravelMate™ 4000 WinSX™ or WinDX™/25MHz

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TEXAS INSTRUMENTS

^{*}Manufacturer's Suggested Retail Price. Dealer prices may vary.

Considering Hardware

Most Windows fax programs make faxing a breeze. But getting one to work with your PC and fax-modem can be tricky.

First, is your PC powerful enough? Generally speaking, if your PC can run Windows, it can run Windows fax software. Be aware that background faxing imposes heavy demands on the RAM, the processor, and the hard disk, so you'll want to be well stocked with all three. We recommend at least a 25-MHz 386DX processor, 4MB of RAM, and 80MB of hard disk space. Also, if you use your phone frequently, consider getting a dedicated fax line.

Matching Software to Modem

Next, you need to consider fax software and fax-modem compatibility—technical territory that's like quicksand waiting to trap the unsuspecting buyer. While you don't have to think twice about matching a third-party E-mail communications program, such as *Procomm Plus*, with any brand of data modem, fax software is a different matter. A fax-modem and a fax program may each support any of the four fax conventions. But even if they support the same ones, they still may not work together.

The seven programs reviewed here support the Class I, Class II, and CAS conventions. All except *Eclipse Fax* also support the Sierra Sendfax convention, as do many send-only fax-modems. (All these protocols fall under the Group III fax standard, which means they will let you send faxes to standard fax machines.) Because Class I is the only true standard and the most reliable of the three, we tested the software using Class I whenever possible. (At press time, Class II was in the final stages of becoming an internationally accepted standard.) While Class II and CAS offer the promise of smoother background faxing than Class II—a Class II or CAS modem can assume some of the computer's processing—both conventions have been plagued with uneven implementations by modem-chip makers and software developers. To further complicate matters, some fax-modems are proprietary and work only with their bundled software.

Protect Yourself

Your best bet currently is to find a modem and a fax program that both support Class 1. But even that's not an ironclad guarantee. The Intel, Sofnet, and ZSoft programs failed to work with one of our Class 1 test modems—the U.S. Robotics Sportster 14,400—even after some of the software vendors had assured us it was "no problem." In the end we were able to run all the programs except for ZSoft's *Ultrafax* using Class 1 on the Intel SatisFaxtion Modem/400e. *Ultrafax* could send, but not receive, faxes with that modem.

The rule of thumb: To make sure a fax-modem will operate with your fax software, call the software company and ask if its program has been tested with your make and model of fax-modem. To protect yourself, ask for a money-back guarantee in case the software and modem aren't compatible. But even if they are, the only way to be assured that they will perform well together is to try them out yourself.

fax page was transmitted, placing *Eclipse Fax*'s performance fifth among the seven programs. Other shortcomings include the inability to export phone book fields to a database and a bug that causes a small portion of the right side of resized areas of the fax to be missing on the printout.

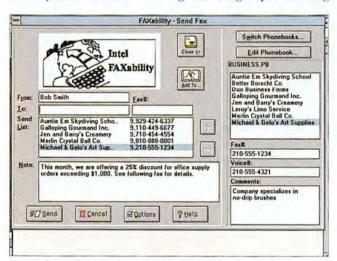
Lackluster performance notwithstanding, *Eclipse Fax* earned its place in the sun. With decent marks for ease of use and a first-rate fax viewing, editing, and indexing system, *Eclipse Fax* ranks a solid third in overall value. The upcoming OCR upgrade should make this an even more attractive package.

Eclipse Fax 1.2, Eclipse; 312/541-0260, 312/541-0514 (fax). List price: \$119, upgrade with OCR \$50. Reader service no. 693

Intel: Faxability Plus/OCR 1.0

PROS: Top-notch background performance, excellent OCR, easiest to use CONS: Limited fax viewing options, no image editing, high price

Intel's product turned out to be the darling of our panel and of this reviewer. As Christina Smith said, "Faxability is head and shoulders above the rest." The rest of the test team agreed, giving it the highest ease-of-use rating in the bunch. The program's menu system is so intuitive that beginners can get up and running



GROUP FAXING: Intel's Faxability Plus/OCR lets you create a group fax list on the fly. Highlight a name in the phone book directory at right and click on the + button to add a recipient to the Send List.

in just a few minutes. We also loved the way Faxability allows you to work virtually uninterrupted while faxing in the background.

Faxability's group fax feature conveniently lets you send faxes to a predefined group or create a pick list by clicking on names in the phone book directory. Newcomers will also appreciate the way Faxability's OCR system is smoothly integrated into the program. To create an editable text file from a fax, just choose the Save As menu item, which presents a slew of graphics and text file formats you can choose for your output. If you pick a text format, Faxability invokes OCR to generate the file. Faxability uses Calera's Wordscan 1.1 as its OCR engine—a good choice, since Faxability's performance ranked best in our OCR speed and accuracy tests.

You won't find a better program for log management. In addition to the send and receive logs, Faxability lets you create logs in which you can display events based on many different criteria, including status (Read, Unread, Sent, Pending, Error/Abort), sender/recipient name, time sent or received, and newest or oldest entry first. When a new log is created, the program automatically copies all the entries selected by your filter from the original send and receive logs, and a new log icon appears at the bottom of the desktop.

Faxability's fine degree of control over your laser printer rivals that of many word processors. Options include a choice of eight paper sizes, manual feed or envelope, output resolution, page orientation, and duplex printing with the appropriate printer. The Fonts option lets you install either soft or cartridge fonts and scalable type-faces if you're using a Hewlett-Packard LaserJet Series III printer.

Faxability's feature set, while extensive, falls short of the mark in a few areas. Its fax viewing options are basic: a few levels of zoom, best fit, fax invert, and page flip. We were surprised there's no way to turn a page on its side for landscape viewing—this isn't the program for viewing spreadsheets. Although its OCR system worked very well, it lacks proofreading enhancements, so you have to go into your word processor to check the document. We were most surprised that a program of this caliber provides no image-editing tools.

These are gaps in *Faxability*'s otherwise healthy feature set. If you've got 6MB of hard disk space available, you can't go wrong with this full-featured program that tops the charts.

Faxability Plus/OCR 1.0, Intel Corp.; 800/538-3373, 503/629-7354, 503/629-7227 (fax). List price: \$249, Faxability Plus without OCR \$119. Reader service no. 694

Sofnet: Faxit 2.15e

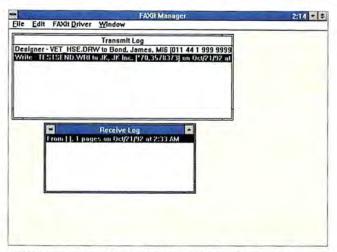
PROS: Reliable program with excellent ease of use CONS: Lacks some common fax management tools

Sofnet's Faxit is an inexpensive, bare-bones package. It doesn't currently boast OCR (although an OCR version will be out when you read this) or an image editor. You can't exchange phone book records with a database. And it doesn't even let you flip faxes that arrive upside down. As one of Sofnet's technicians put it, "Faxit is a glorified printer driver that sends files to a fax-modem."

But this no-frills program does the basics very well and demands only 1MB of disk space. Our performance tests on the Intel 400e modem showed only momentary foreground interruption during handshakes, causing barely a hiccup in overall operation. Although a few of the testers remarked on the lack of an incoming fax alert when a fax is received while working in the program, the panel's overall assessment was that Faxit is easier to use than any other program except Intel's Faxability Plus/OCR.

As our panel discovered, using the send and receive fax logs is no challenge: Each log lists the file, the recipient, and the send date and time. To view the fax, you simply double-click on the fax listing in the log. It's a cinch to forward received faxes and resend them: Just use the Print command while viewing the fax. Faxit also has one of the most comprehensive lists of modern drivers—a total of over 80 in all.

Faxit is not without its quirks. Although this is a Windows program, it relies on a DOS TSR, which can be troublesome for people who use other such programs on their computer. In scheduling faxes, we found it strange to have to specify the amount of time we



SIMPLE INTERFACE: Sofnet's Faxit features a Transmit Log and a Receive Log that list basic information on each fax, including the application and file name for the faxed document.

wanted to delay the fax, instead of just entering the time at which to send it. We also found the manual a little disorganized. Low-resolution received faxes appeared squashed on the screen, and error messages were sometimes inaccurate. On the whole, however, Faxit is a solid, reliable program, placing fourth overall.

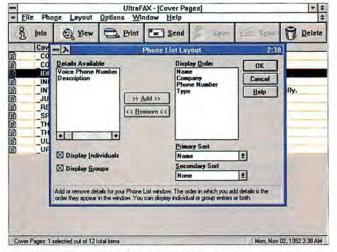
Faxit 2.15e, Sofnet; 404/984-8088, 404/984-9956 (fax). List price: \$99, Faxworks Plus upgrade with OCR \$99. Reader service no. 695

ZSoft: Ultrafax for Windows 1.0

PROS: Terrific feature set

CONS: Difficult to set up, confusing interface

Ultrafax has the richest set of features of the seven programs we reviewed, although Eclipse Fax comes close. Ultrafax also performed with no interruptions to the foreground application while sending faxes, but it failed to receive faxes using our performance test modem. Even worse, Ultrafax ranks lowest in ease of use. All but two of the panelists had problems with this program, ranging



ORGANIZING THE PHONE BOOK: ZSoft's Ultrafax lets you set the order for displaying information on phone book entries. You can also use any two phone book fields for primary and secondary sorts.

COMMUNICATIONS FAX SOFTWARE

from Kathy Shultz's struggles with setup to Cliff Lawson's conflicts with complicated menus. Thom Stark deemed *Ultrafax* "extremely counterintuitive." Several panelists softened their stance during the receive-fax tests, which they performed later.

The program's *Ultrafax* Manager desktop window contains five smaller windows, which you can size or position as you like. These windows contain the Phone Book, the In Box (received-fax log), the Out Box (sent-fax log), the Cover Pages Library, and Document Storage. Using the Layout command, you can modify the order in which information is displayed in each of the five windows, such as the order of the fields in the phone book. You can also do extensive sorts, such as primary and secondary sorts on the phone book en-

tries, received faxes, and sent faxes. The most frequently used commands have been grouped together on a convenient button bar along the top of the *Ultrafax* desktop.

It's almost criminal that *Ultrafax* is generally so difficult to work with, because it offers an astounding array of features. The program's robust fax viewer comes with tools to flip, rotate, and invert the fax, and to enhance it through antialiasing, as well as a noise-removal function that wipes off spurious specks caused by phone static during transmission. The fax viewer can also display thumbnails of all the pages in a multipage fax. Even stronger are the image-editing tools, which allow you to mark up the fax with lines, circles, boxes, and freehand drawings, as well as place text on the

FEATURES COMPARISON

Delrina, Eclipse, and Zsoft Lead the Pack for Best Features

· ·	1	1		BEST	BUY	1	1
• Yes	Bit Software Bit Software Bit Software Bit Software Bit Software Bit Software	Caere 1.01 Fax Master 1.01	Delina Technology Nunfax Pro 3.0	Eclipse Fax 1.2	Intel Faxability Plus/OCR 1.0	Somet Fault 2.15e	TSoft Ultrafax for Windows 1.0
O No	10 0 mg	aste	A TE	22	CREA	2	ido Jitt
\	3 × 5	1	03.Cm	13	1.5 off	12	No Tag
Standard features	.05	=	Nogy \	-	_	126	.0
List price	\$129	\$149	\$129	\$119	\$249	\$99	\$119
CPU	386	386	286	286	286	286	386
RAM required (MB)	4	4	4	2	4	1	2
Hard disk required (MB)	5	8	7	3	6	1	5
Works with Windows 3.1	•		•	•	•	•	•
14.4-Kbps faxing with appropriate modem	•	0	•1	0	•2	•	•
Setup							
Setup determines COM port	0	0 1	•	0	0	0	
Partial program install	0	0	•3	0	0	0	•4
Modem convention auto-match	•	•	•	0	•	0	
Installation audit trail	0	0	•	0	0	0	0
Automatic uninstall	0	0	0	0	0	0	
Sending faxes							
Multiple phone book directories	0		•		•	•	
Phone book search	name	first name, last name, company	all fields	last name, company	name	name	all fields
Customizable phone book display	0	0	•	0	0	0	•
Exchange phone book and database records	•	•	•	•5	●6	0	•
Phone book records kept in dBASE format	•	•	•	0	0	0	0
Fax merge	0	0	•	•	0	0	0
Send fax preview	0	0	•	•	0	•	•
Send fax during call	0	•	0	•7	•	0	•
Collect multiple files into fax	•	•	•	•	•	0	•
Send partial page	O ⁸	•	•	•	•	0	0
Resend faxes	•	•	•	•	ಿ	•	•
Receiving faxes							
Incoming fax alert	0	•	•	•	•	•	
Receive fax during call	0	0	0	•7	•	0	•
Reception of incomplete fax	•	•	•	•	•	•	•
Option to print received faxes automatically	0	•	•	•	0	0	•
Print partial fax page	0	0	0	•	•	•	0
Automatic fax forwarding	0	0	0	•	0	0	0

fax in a wide range of fonts, styles, and point sizes. If you're done looking at the fax but still want to keep it, *Ultrafax* can compress and file the fax and let you find it later using keywords.

Ultrafax also has extensive phone book features, terrific scanner support, and, of course, OCR (from Ocron), which performed well in the speed and accuracy tests. ZSoft also tossed in ATM PostScript fax fonts, sample cover pages, and tutorial documents.

One of ZSoft's most intriguing features is Ultrafax Transmission. This allows you to attach a binary file of the original document to an outgoing fax so the recipient has an error-free editable file of the fax to work with. But Ultrafax Transmission needs to connect to another *Ultrafax* system in order to work.

As tantalizing as its features and performance are, *Ultrafax* was not quite ready for prime time when we tested it: It was the only program that didn't let the Intel 400e modem receive faxes. Taking into account the trouble our panelists experienced with setup and the interface, we had to rank it fifth overall in this roundup. This program is one to keep an eye on, however. Once ZSoft designs a friendlier interface, its appeal should skyrocket.

Ultrafax for Windows 1.0, ZSoft; 800/227-5609, 404/428-0008, 404/427-1150 (fax). List price: \$119. Reader service no. 696

For more information about all products in this article, circle reader service no. 903.

				BEST	DUV		
	BINFAX OCR 2.05	Caere 1.01 Fax Master 1.01	Delrina pro 3.0 Winfax pro	Edlipse Fax 1.2	mel Faxabilis	Somet Fault 2.15e	750ft Ultrafax for Windows 1.0
ax management Fax flip (180 degrees)					•	0	1
Turn fax on side to view (portrait to landscape)	•	•		•	0	0	•
Zoom range (percent of original size)	25, 50, 75, 100, 200	25, 50, 100, 200	25, 50,100	1 through 4800	25, 50, 100, 200	25, 50, 100, 200	25, 33, 50, 66, 7 100, 200, 400, 60
Can size area to zoom	0	0	011	•	•	0	0
Fax invert	0	0	0	•	•	•	•
Capability to save rotations/inversions	•	0	•	● ¹²	0	•	•
View multiple pages on one screen	0	6 (VGA), 12 (SVGA)	10 (VGA)	limited only by screen resolution	4	0	8
Antialiasing	0	0	•	•	0	0	•
Copy and paste images onto fax page	0	0	0	•	•	0	•
Image editor	0	0	•	•	0	0	•
Save fax portion	0	0	0	•	•	•	•
Sent fax auto-delete	0	0	•	0	•	0	•
Timed delete of received fax	0	0	•	0	0	0	0
Fax compression for storage	0	•		•	0	0	•
Export fax to graphics file formats	BMP, PCX, DCX	PCX, TIFF, PICT	BMP, PCX, TIFF, WinFax	PCX, DCX, TIFF	PCX, TIFF	PCX, DCX, TIFF	BMP, PCX, TIFF
OCR engine	Caere Anyfax	Caere Anyfax	Caere Anyfax	none	Calera Wordscan 1.1	none	Ocron
Scanner support	0	42 scanners	TWAIN scanners	HP, Microtek, Fujitsu	TWAIN only	0	more than 50 scanners
ocumentation							
Quick-start guide		0		•	•	0	•
Troubleshooting section	•	0	•	•	0	0	•
ervice and support							
Daily support (hours)	8,5	9	10	8	10	9.5	9
BBS	•	•	•	0	•	•	•
On-line	0	0	CompuServe	CompuServe, MCI	CompuServe	CompuServe	CompuServe
Fax-back	0	0	•	0	•	0	0

¹ Class I and II only.

⁴ Minimum install is 3MB.

⁷ Except in CAS.

¹⁰ Plus one custom setting between 10 and 600 percent.

Only with SFAX/400 modem.

Import from database only.

Cover page only.

¹¹ Lets you place a box of fixed size over area to zoom.

Minimum install is 2.5MB.

Must download free utility from Intel's BBS.

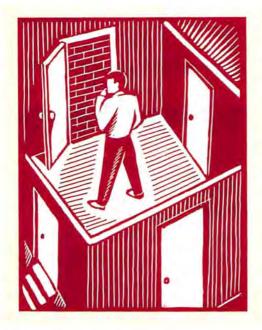
Resends only those that weren't sent successfully.

Except 90- and 270-degree rotations.

Here's How

Contents: Spreadsheets 2341 Word Processing 2381 Windows 2421

HELP LINE Q & A



Tip of the Month

GETTING THE MOST FROM UNDO: Every program worth its salt includes an undo command to protect you from your own mistakes. You probably know how to undo an action in your favorite program. In most Windows applications, for instance, you select Edit • Undo or press <Ctrl>-Z or <Alt>-<Backspace>, and whatever you did last—typing, deleting, formatting—gets undone. But you have to act immediately after making the error, or you lose your chance to recover.

Undo has less obvious uses as well. For instance, it can help you choose between options: Suppose you want to see how your document looks in a different font or with different margins. Simply make the change, examine the results, then press <Ctrl>-Z to go back to the original. If you're still not sure, press <Ctrl>-Z again to go back to your new version. You can repeat this step until you make a decision.

WordPerfect, by the way, offers a way to restore any of the last three text deletions. In the DOS version, press <F1>, then P to toggle through them. When the text you want appears at the cursor, press R. In the Windows version, select Edit • Undelete or press <Alt> <Shift> <Backspace>, then select which deletion to restore.

George Campbell, contributing editor

Can Speakers Damage Data?

Can magnetic fields from speakers damage or erase software?

Daniel R. Dampier, Oberlin, Ohio

A Since speaker cones contain electromagnets, it's a bad idea to store floppy disks or backup tapes alongside, under, or on top of a speaker. Not all speakers cause problems, but it's best to err on the side of prudence.

With soundboard-driven speakers becoming common PC accessories, I'll have to add them to my list of the common magnetic hazards that can damage floppy disks. As mentioned in October's column, the list includes magnets in paper-clip holders, copy stands, key chains, and charm bracelets, and electromagnets inside monitors, mechanical-bell telephones, electric pencil sharpeners, and AC/DC adapters. I wouldn't set my Walkman headphones on top of a disk, either.

640K of RAM Required?

I recently purchased a program that requires 640K of RAM, according to the manuals. No matter how I reconfig-

ure DOS 5.0's memory management, I can't seem to free more than 609K. What should I do?

Patrick Chieh, Lagos, Nigeria

No DOS application actually requires 640K of free conventional memory. The most free RAM DOS 5.0 can give you is 623K, and with earlier versions of DOS, you get even less. The worst RAM-hog programs I've seen use only about 500K of conventional memory. Programs with larger memory requirements, like *Paradox 4.0*, use DOS extenders (which usually conform to Microsoft's DOS Protected Mode Interface, or DPMI, standard) and require extended memory.

The confusion stems from the two different ways vendors state their applications' requirements. Some state RAM requirements in terms of the amount of memory their application uses, others in terms of the total memory that must be installed in the system. For example, the *Microsoft Word* box says, "384K available memory required," meaning there must be at least 384K free when you start the program (to check, type

MEM or CHKDSK at the DOS prompt). In contrast, the dBASE IV 1.5 box reads, "640K system required; dBASE IV and its applications will use 450K." This means that on a system with only 512K of RAM (the usual next step down from 640K), after you load DOS there won't be enough free memory to run dBASE.

Clearly your application's 640K RAM requirement refers to the total amount of RAM installed, not how much is free. If you have over 600K free and still can't run the program, the problem is something other than memory.

No Radiation Danger From Laptops

Q Is there any cancer-causing radiation danger from holding a laptop in your lap or sitting in an airplane seat next to someone using a laptop? Hal W. Howes, McLean, Virginia

A You're thinking of the extremely low frequency (ELF) magnetic fields emitted by the flyback transformers in desktop monitors. Studies have shown that at certain frequencies and power levels, ELF magnetic fields have adverse effects on animals, and an Austra-

Data Management 2461 Publishing & Presentations 2521 Communications 2601 Star-Dot-Star 262

lian study found a correlation between use of computer monitors and brain tumors. A recent Finnish study found that women working at monitors with high ELF emissions suffered more miscarriages than women using monitors with low emissions, like those that conform to the Swedish MPR2 guidelines.

Monitor manufacturers generally deny that ELF emission is a problem, but they are nevertheless redesigning their monitors to reduce emissions. In any case, according to the New York-based ELF watchdog VDT News, the LCD screens used in laptops emit negligible amounts of ELF radiation and have no known adverse health effects.

Buy a Math Coprocessor?

I am considering adding a math coprocessor to my PC. Two programs I use a lot support a math coprocessor. Will other programs benefit from the addition, or do programs need to be coded to take advantage of it?

Mark Stewart, Allen, Texas

Ignore those ads that claim a math coprocessor (also known as a floating-point unit, FPU, 287, or 387) will turbocharge all your software. Most applications don't do any floating-point math, so there's no reason for them to support an FPU. Even programs that use the FPU use it only for certain functions-the FPU doesn't speed up everything the program does (and yes, those functions were programmed to use the FPU). For example, spreadsheets use the FPU to speed up financial, statistical, and trigonometric functions, but the FPU doesn't make scrolling the sheet or recalcing other functions any faster.

Usually programs with functions that can get a significant speed boost from the FPU support it. Such programs include accounting, financial, statistical, and scientific math programs; CAD and other drawing-oriented graphics programs; relational databases; and Post-Script interpreters.

Programs that generally do not bene-

fit from math coprocessors are word processors (though Word for Windows' calculation and sort work faster with an FPU); desktop publishing, forms, paint, and presentation graphics programs; flat-file databases; communications software; and system software—DOS, Windows, utilities, and networks. Also, most scalable-font programs, including the two most popular—Adobe Type Manager and Windows 3.1's built-in True Type—do not use an FPU.

Note that the FPU is an add-on for 286 and 386 systems and built into the 486DX. For 486SX systems, the story is different: The 487SX "math coprocessor" is actually a 486DX with a special pinout. You install it in an "upgrade" socket, which disables the 486SX. However, to add an FPU to a 486SX system, you should install an OverDrive processor (which contains a built-in FPU) instead of the 487SX. The OverDrive speeds up system performance by an average 70 percent in addition to the gain its internal FPU delivers.

Distinguishing Disks

I buy 5%-inch disks in bulk in both 360K and 1.2MB sizes. How can I tell them apart if they get mixed up? They all look the same.

Bob Mick, Chicago

A If the disk has no label or the label doesn't say DD (for double-density, 360K) or HD (for high-density, 1.2MB), look at the front side of the center of the disk. If there's a hub ring (reinforcing plastic, about ½ inch wide) around the large hole, it's probably a 360K disk; if there isn't a ring, it's probably a 1.2MB disk.

However, labels and rings aren't definitive. If you format what you think is a high-density disk to 1.2MB and end up with hundreds of thousands of bytes in bad sectors, you've most likely mixed them up. Reformat it to 360K with FORMAT A: /F:360 (or FORMAT A: /4 if you use DOS 3.x or earlier). If the disk then has no bad sectors, it's a normal doubledensity disk. If it still has tens of thou-

USER GROUP OF THE MONTH

Central Kentucky Computer Society

The February User Group Tips come from the Central Kentucky Computer Society, a multiplatform user group. In addition to operating an electronic bulletin board and publishing a monthly newsletter (with a technical support listing), the Central Kentucky Computer Society holds monthly meetings open to the public. Over a dozen special interest groups, including ones for databases, desktop publishing, fundamental DOS, Windows, and WordPerfect, meet at its resource center. A software library is available on line.

For more information about the Central Kentucky Computer Society, contact David Reed at 1300 New Circle Rd. #105, Lexington, KY 40505. Yearly memberships are \$20 for individuals, \$15 for students and seniors, and \$30 for families.

Reader service no. 644

Saving Your Search Paths List: If something changes the extended directory-search paths list set by your AUTOEXEC.BAT's PATH command, how do you get it back? Do you reissue the PATH command? Do you reboot your computer? Rerun AUTOEXEC.BAT? Here's an easier way to reconstruct the search paths list:

In your AUTOEXEC.BAT file, immediately following its PATH command, add the command PATH > C:\SYSPATH.BAT on its own line. After the next time you boot your computer, if something accidentally modifies or destroys your search paths list, just enter C:\SYSPATH at the DOS prompt to restore it to normal.

Bob Brown Central Kentucky Computer Society



sands of bytes in bad sectors, it's probably defective, so trash it.

Design Your Own Fonts

As a professional sign artist, I have collected books of fonts for years and have a sizable collection built up. I would like to be able to scan some of my favorites and put them in *Gorel-Draw 2.1* as regular fonts. Can you tell me how to do this? I see shareware and freeware fonts all over the place—how are these produced?

Mark Aaron, via PC World Online

You could use Corel Trace to turn a A scanned character into an outline, edit it in CorelDraw, and export it to a font file. (Look up WFNBOSS in the CorelDraw manuals for more information.) That process is pretty tedious, though. Most shareware, freeware, and commercial fonts are produced using special font-editing programs. Rather than starting from scratch, designers often start with a font that roughly matches the style they have in mind and edit it until they get the desired effect. Here are three Windows programs you can use to produce True-Type and PostScript fonts.

 FontMonger \$149.95; Ares Software Corp.; 800/783-2737, 415/578-9090, 415/378-8999 (fax)

Reader service no. 601

- Fontographer for Windows \$495; Altsys Corp.; 214/680-2060, 214/680-0537 (fax)
- Reader service no. 602
- Publisher's Type Foundry \$545; ZSoft Corp.; 800/444-4780, 404/428-0008, 404/427-1150 (fax)

Reader service no. 603

QBasic Documentation

My computer came with QBasic installed as part of DOS 5.0, but I didn't get a manual for the program. Where can I get books or other reference materials that explain this tool? Brian Evans, Osawatomie, Kansas

A The only QBasic documentation included with DOS 5.0 is the program's extensive on-line help. Supplementary written documentation is available from several publishers. Here are a

few titles suitable for beginners. Any bookstore can order them using the ISBN listed.

- QBasic By Example, Greg Perry, \$21.95
 (Que, ISBN 0880228113)
- QBasic Programming, David Schneider and Peter Norton, \$39.95 including disk (Prentice Hall, ISBN 0136587666)
- Running MS-DOS QBasic, Michael Halvorson and David Rygmyr, \$22.95 (Microsoft Press, ISBN 1556153406)
- Using QBasic, Phil Feldman and Tom Rugg, \$24.95 (Que, ISBN 0880227133)

Run Software From Drive B:

I have a 5%-inch A: drive and a 3%-inch B: drive. I prefer to run my software off 3%-inch disks. I copied one of my programs from its 5%-inch distribution disk to a 3%-inch work disk, but when I try to run the program it tells me to place the "master" disk in the A: drive. Is there a way to override this? Brian Garrett, Cleveland, Georgia

A That depends on the program. Some programs are written so they'll run only from drive A:. Others will run from drive B: if you first enter ASSIGN A=B at the DOS prompt. When the program tries to read drive A:, ASSIGN steers it to drive B: instead. After you exit the program, enter ASSIGN to set drive A: back to normal.

If this trick doesn't work, your program is copy-protected. If you really want a 3½-inch version, contact the vendor, which should provide you with one for a nominal charge (but may insist you return the 5½-inch master).

Reinstalling Copy-Protected Programs

I own 1-2-3 release 2.01. Thanks to a nasty series of hard disk problems, the copy-protection counter is now at zero, and I've been reduced to running the program from the distribution floppies. Is there some way I can get it running on my hard drive again?

Jason K. Douglas, York, Pennsylvania

A When disk problems prevent you from running copy-protected software, you should always be able to get new disks from the company for a nominal charge, or at least upgrade to a newer version of the program. If not, contact *PC World's Consumer Watch* columnist. If the company goes out of business, you're out of luck—which is why copy-protection schemes that interfere with backups went out of style.

Luckily, Lotus is still in business. You have three options for getting 1-2-3 back on your hard disk. First, you can download R20SUP.EXE from Compuserve's LOTUSA forum. That file contains a utility that will remove the copy protection from your 2.01 distribution disks and allow you to reinstall it. If you don't have access to CompuServe, you can get the same utility from Lotus as part of the company's \$15 Value Pack for 1-2-3 2.01. Or you can upgrade to 2.4 for \$119 (if you want 3-D capability, consider upgrading to 3.1+ or 1-2-3 for Windows).

 Value Pack for 1-2-3 2.01 \$15, 1-2-3 2.4 upgrade \$119; Lotus Development Corp.; 800/343-5414, 617/577-8500

Reader service no. 604

No-Battery Notebook Redux

- n November's column, I told reader J. Nathaniel Marshall I hadn't seen a notebook that didn't require a battery even when plugged into AC power. Now I have: Advanced Scientific's 6.4-pound 25-MHz 386SXL's built-in power supply works fine without the battery. So if you work only where there is power, you can leave out the battery and reduce the weight to 5.8 pounds.
- ASCO Notebook with 2MB RAM and 60MB hard disk \$1370, with 80MB hard disk \$1450; Selcor Direct; 800/777-7058, 415/578-1165 (fax)

Reader service no. 605

By Robert Lauriston

Robert Lauriston is a contributing editor for PC World.

Mail your questions to Help Line, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Help Line; CompuServe, 75300,3205; MCI Mail, 381-7106; Internet, rlauriston@aol.com; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

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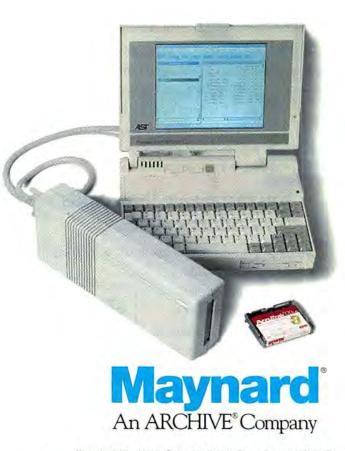
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Scale fonts instantly. In virtually any point size.

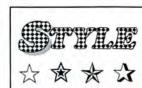
With FaceLift 2.0, you can scale fonts — including symbols and dingbats — instantly, in any size from

2 — 500 points. And still maintain top quality. Since Bitstream fonts are scalable outlines, not bitmaps, you'll get the clean, smooth look you want every time, in every size. In a flash.

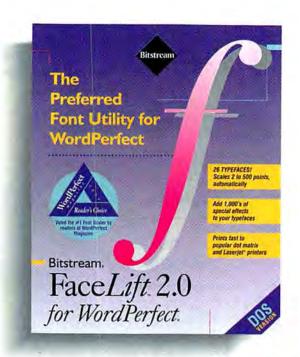
You can create thousands of new styles.

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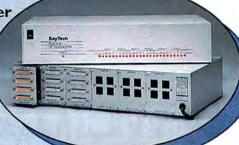
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SPREADSHEETS Q & A

Freak Protection in 1-2-3

We recently had a freak spreadsheet accident. A temporary worker professed to know how to use *1-2-3*, so we set him to entering data into a management report. Long after he was gone (and the report submitted), we discovered some of the answers were incorrect. Upon investigation, we realized that the temp had replaced some of the formulas with numbers!

What's the best way to guard against such errors?

William A. Horton, Dallas

There are two general approaches: You can use data protection features the program provides, or you can provide visual cues to distinguish formulas and data. I'll illustrate the techniques with 1-2-3, but you can use them in any popular spreadsheet program.

Data protection features use one command to mark data entry cells and

another to prevent changes to unmarked cells. In 1-2-3, use /Range • Unprotect to mark all cells where data entry is allowed. Then, to protect the other cells in the worksheet, including your formulas, select /Worksheet • Global • Protection • Enable. Once you've done this, you can enter or edit data only in the areas specifically marked as unprotected. Figure 1 shows what happens when you try to write in a protected cell.

The problem with global protection is that it prevents you from inserting or deleting rows and columns, and it's a hassle to turn it off and on when you want to edit the sheet. So unless you really need that degree of protection, you might go for visual cues instead.

As you might notice from Figure 1, unprotected cells appear in a different color. This color coding happens when you use the /Range•Unprotect command and doesn't require you to actually protect the rest of the worksheet.

You can then simply tell your temporary employee to enter data only in the blue cells (the colors vary with different versions of 1-2-3). In Quattro Pro or Excel, you can use colors, shading, or font changes to make the distinction.

Incidentally, Quattro
Pro for DOS 4.0 has a
special command, Options • Protection •
Formulas • Protect, that
protects only formulas.
For Quattro Pro users,
this convenience may
be the best solution.

Finding Zero in 1-2-3

I have a 1-2-3 macro that steps through a column of values, pausing on each cell that contains a zero so that I can en-

ter a new data value. Here's a simplified version:

(IF @CELLPOINTER("contents")=0){?}~ {down}{branch \N}

My problem is that the macro isn't able to recognize the difference between a cell that contains the number zero and a plain old empty cell—I don't want it to stop at the latter.

Bill Bliss, Detroit

A Try replacing the macro's first line with {IF @CELLPOINTER("contents") = 0#and#@CELLPOINTER("type") = "v"}?}~.

@CELLPOINTER does return information about the current cell, but you're not getting enough information. A blank cell behaves like a zero in most calculations, and that's how @CELL-POINTER("contents") sees it. By adding @CELLPOINTER("type"), which returns a v if the current cell contains a number or formula, the macro finds only real zeros. Essentially, what this technique does is make your macro pause when the current cell is both a zero and a number.

No Calc in My 1-2-3, Thank You

Is there some way to prevent people from recalculating the formulas in a 1-2-3 worksheet, even if they press the recalc key (<F9>)?

Millie Metier, Leewater, Kentucky

A You might try the macro in Figure 2, which executes automatically when you retrieve the worksheet. To construct the macro, enter all the labels shown in an out-of-the-way spot in your worksheet, remembering to precede every label that starts with a slash (f or \) with an apostrophe ('). Once you've entered them, put the cell pointer on A1, select /Range Name Labels Right, paint the range shown here as A1..A3, and press <Enter>. This macro will run automatically whenever you load the worksheet.

The statement in B1 executes the command /Worksheet•Global•Recalculation•Manual, which turns off the nor-

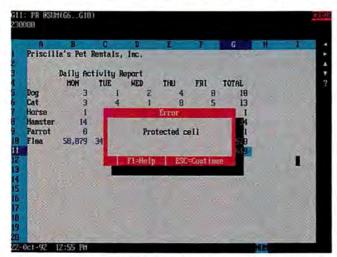


FIGURE 1: A PROTECTED WORKSHEET won't let you change anything in cells that you shouldn't be changing.

	A	В
1	10	/wgrm{branch \0.1}
2	KEY	
3	\0.1	{get KEY}
4		{if KEY="{CALC}"}{branch \0.1}
5		{branch KEY}

FIGURE 2: DEACTIVATE THE RECALC KEY with this 1-2-3 macro.



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80486DX2-66		80486DX2-66		80486SX-25	80486DX2-66	80486DX2-66	٠	80486-33	80486DX2-50
VESA IDE		X Emulation		Upgradable	EISA Ethernet	16 Port EISA	٠	VESA IDE	Ethernet
64K Cache		64K Cache		MPC Kit	64K Cache	64K Cache		64K Cache	64K Cache
4MB SIMM		4MB SIMM		4MB SIMM	16MB SIMM	32MB SIMM		8MB SIMM	4MB SIMM
120MB IDE		Ethernet		120MB IDE	660MB SCSI	1.2GB SCSI	٠	120MB IDE	120MB IDE
1.2 & 1.44 Floppy		1.44 Floppy		1.2 & 1.44 Floppy	1.2 & 1.44 Floppy	1.2 & 1.44 Floppy		1.2 & 1.44 Floppy	1.44 Floppy
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14" NI VGA	٠	17" NI VGA		14" NI VGA	14" Mono VGA	14" Mono VGA		20" NI VGA	14" NI VGA
101-Key KB		101-Key KB		101-Key KB	101-Key KB	101-Key KB		101-Key KB	101-Kev KB
Mouse		Mouse		Mouse	Mouse	Mouse		Mouse	Mouse
DOS 5.0		DOS 5.0		DOS 5.0	DOS 5.0	DOS 5.0		DOS 5.0	DOS 5.0
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mal formula recalculation. The {GET} command in B3 pauses the macro until the user presses a key, whereupon it puts the keystroke into the cell named KEY, B2. When you press a key other than <F9>, its character or command replaces the label in that cell. B4 contains an {IF} statement that tests whether the last key pressed was <F9>. If not, it branches the macro back to B2 and then executes the key that the user just pressed. But if the user pressed <F9>, the macro branches to B4, thus bypassing the {CALC} keystroke.

Juggling Clients in Quattro Pro

I maintain a separate Quattro Pro worksheet file for each of my clients, with a series of standard data items in all of them. I'd like to create a separate report worksheet that would work for all of my clients, something that I can easily load a single client's

Spreadsheet Toolbox

Want to get information out of your PC, minicomputer, or (worse yet) mainframe database and into a Windows spreadsheet where you can use it? Have you found the database access features supplied with your spreadsheet to be incomprehensible or limited to a few database formats? Wouldn't it be nice if there was a universal, Windows-based "can opener" to open those database files, examine their data, select some records, and put them into your Quattro Pro for Windows, Excel, or 1-2-3/W worksheet?

Look no further than the latest upgrade of Pioneer Software's Q+E Database Editor—a big improvement over the modest utility that comes bundled with Excel. For one thing, Q+E 5.0 supports DB2, AS/400, Ingress, Oracle, SQL Server, Paradox, and dBASE, to mention a few of the big iron and PC database formats. It lets you open tables, join them, query the joined tables, sort the results, create calculated fields, and copy or link the output back into your spreadsheet. You can also group and summarize records, format and rearrange fields, set up data entry forms, and produce reports directly from Q+E.

Version 5 brings Q+E's interface into the Windows 3.1 pointand-click era, complete with the obligatory icon bar. There's also a WinWord template for mail merges and an add-in sheet for Excel. My only caveat: When you venture into complex queries, it's best if you're familiar with the basics of SQL syntax.

Q+E Database Editor 5.0 \$299, upgrade from Excel Q+E \$99; Ploneer Software; 919/859-2220

Reader service no. 645

data into. How can I set this up? Norman Simon, Pulaski, Virginia

You can easily set up your report so that typing a worksheet file name in a particular cell will bring you that sheet's data. Let's say that all your client worksheets have a range named DATA (that you created in each worksheet with the /Edit Names Create command). Let's also assume that one of your client files is named SMITH-.WQ1, and that these files are all stored in the \CLIENTS directory. In your report worksheet, enter the label SMITH into cell B1. In B2, enter the string formula +"[\CUENTS\"&B1&"]DATA". This will display the value [\CLIENTS\ SMITH]DATA. Now in cell B3, enter the formula @SUM(@@(B2)); you'll get the total of values in SMITH.WQ1's DATA range. That's because the @@ function returns the label in B2-the range DATA in SMITH-as a range

address. From now on when you enter a different file name in B1, you will get that file's DATA sum.

Sorting an Array in Excel

I'm using Excel's Data•Table command to calculate payment alternatives for our sales proposals. I was delighted to find that Excel's data table (unlike 1-2-3's) contains live formulas so you don't have to regenerate it when you change the input values. When I try to sort the table, however, I get an error message: 'Cannot change part of a table'. What am I doing wrong?

Juanita Perez Sausalito, California

A If you put the cell pointer in your table and take a close look at the formula bar, you'll see telltale braces around the formulas: for example, {='TABLE(,C2)}. This tells you *Excel* created the table as what it calls an *array*, meaning the spreadsheet treats the range as a single unit. That means that you can't delete a portion of it, sort it, or otherwise break it apart.

There is a solution, but it comes at a price: To sort the table, you have to convert the array formula to ordinary numbers, which means you must regenerate it, as with 1-2-3. If you'll pay that price, select the entire table and choose Edit• Copy. Then, without moving the cell pointer, select Edit•Paste Special, click Values, and press <Enter>. You now have a dumb but sortable table.

Excel Degree Format

I often need to place a degree symbol after a value in a cell in my Excel worksheets. I noticed that there is no degree format available under Format•Number. Can I build a custom format that will do this?

Kerry Dickinson, Ann Arbor, Michigan

A It's easy. Select the cells you want formatted, and choose Format. Number. (Or click the right mouse button on the selection and select Number.) Click the format category, and then click, but don't double-click, the format code closest to what you want. The format will appear in the Code window at the bottom of the dialog box. In that box, put the cursor at the end of the format text, hold down Alt>, and on the numeric keypad type 0176 (ANSI code for the degree symbol). Release Alt> and press <Enter>. Your format is ready.

By Richard Scoville

Richard Scoville is a contributing editor for PC World and a software training consultant based in Chapel Hill, North Carolina.

Mail your spreadsheet questions to Spreadsheets, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Spreadsheets; CompuServe, 72341,2727; MCI Mail, 357-4517; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

Master Class: Calculated Queries in 1-2-3

Keeping formulas in a 1-2-3 database results in a slow, oversize, inflexible worksheet. What's more, when you extract data from such a database, the program copies any formulas as values into the output table.

For these reasons, you're better off keeping the formulas out of the data table and building them in the output range as they are needed. For a small subset of the data, you'll eliminate redundant formulas and give yourself a worksheet that is faster to save, retrieve, and recalculate. This month I'll show you a macro that adds a formula column to an output range.

The macro starts by doing a standard / Data • Query • Extract to an output range. After checking to make sure that at least one record was extracted, the macro makes a copy of a "seed" formula

	A	В	C	D
1	NAME	DEPT	SALARY	RAISE
2	Chaney, Lon	Mkt	25,000	5%
3	Chaplin, Charles	R&D	122,000	3%
4	Fairbanks, Doug	MIS	18,500	10%
5	Garbo, Greta	MIS	41,000	6%
6	Keaton, Buster	MIS	33,000	5%
7	Normand, Mabel	Sales	56,000	8%
8	Pickford, Mary	R&D	78,000	5%
9				
10				
11		DEPT		
12		R&D		
13			OUT_FORMUL	A 0
14			NEW TOTAL	207,560
15				
16	NAME	SALARY	RAISE	NEW SALARY
17	Chaplin, Charles	122,000	3%	125,660
18	Pickford, Mary	78,000	5%	81,900

TO SEE HOW A MACRO CAN EXTRACT DATA and add a calculated field, re-create this worksheet.

	Н	1	J	K	L	M
1	١E	{break}				
2		{blank OUT	_DATA}			
3		/dqeq				
4		{if @COUNT	(OUT_DATA)=0}{quit}		
5		/rncOUT_D	ATA-{esc}.	{up}{end}{	right}.{en	d}{down}-
6		{goto}OUT	SALARY-			
7		/rncOUT_S	ALARY-{bs}	.{down @rov	ws (OUT_DAT	A)-1}-
8		/cout_FOR	MULA-OUT_S	ALARY-		

THIS MACRO ADDS A CALCULATED FIELD to a 1-2-3 data query. It belongs in the same file as the figure shown above.

for each of the output records, producing an output table with an extra, calculated field.

To see the macro in action, re-create the sample personnel worksheet shown in the top figure at left (if you subscribe to PC World Online, you'll find the file in the Featured in February Ilbrary). The database in this worksheet stores the department, salary, and planned raises for a group of individuals. The macro is set up to extract the names of everyone in a given department and calculate his or her new salary from the current salary and raise.

First, type in the database in A1..D8, the two labels in B11..B12, and the four titles in A16..D16. Then use /Data • Query to define the query ranges as input range: A1..D8, criteria range: B11..B12, and output range: A16..D16.

As you can see, the entry in B12 is set to select the personnel in the R&D department. At this point, if you were to extract values from the database with / Data • Query • Extract, you would get, below row 16, the names, salaries, and raises for everyone in the R&D department.

Next, use /Range • Name • Create to define these three range names: OUT_DATA for A17..D18, OUT_FORMULA for D13, OUT_SALARY for D17..D18.

What do these ranges do? OUT_DATA covers the data in the output table, plus the new salary formulas in column D. In addition to its role in the macro, OUT_DATA can be used to print the output records easily. OUT_FORMULA holds the seed formula that the macro copies to the output table, and OUT_SALARY is the place it gets copied to. The macro redefines both OUT_DATA and OUT_FORMULA to reflect the number of records that were extracted.

Now for a few formulas: First, type in the labels shown in C13..C14. In D13, OUT_FORMULA, enter the seed formula +B13*(1+C13). In D14, enter @SUM(OUT_SALARY). That second formula, which doesn't get copied, calculates the new salary total for the selected individuals. At the moment, that's the sum of D17..D18, but when the macro redefines the range name OUT_SALARY, the formula will adjust to sum that group. When you first create these formulas, their results will be zero—don't worry about it.

Now it's time to create the actual macro. Go to another part of your worksheet and enter the labels shown in the bottom figure at left, making sure to precede each label that begins with a slash (/ or \) with an apostrophe ('). When you're finished, place the cell pointer at the label \E and issue /Range • Name • Label • Right. To run the macro, press <Alt>-E.

The macro begins by erasing the old output table, OUT_DATA. Then it extracts the records selected by the current criteria into the area below the output range. If no matching records are found, the macro halts; otherwise, it redefines OUT_DATA to include the full output table. Next, the macro redefines OUT_SALARY to match the current output (and resets the @SUM() function in D14 in the process); then it copies the seed formula into OUT_SALARY to calculate the new salaries. And now you've got a query result with a formula column.

WORD PROCESSING Q & A

Placeholder Boxes in WordPerfect 5.1

Is there an easy way to leave a blank area of a certain size in a WordPerfect 5.1 document? I need to allow room for photographs of specific sizes to be pasted in later.

Mary Dean, Fairborn, Ohio

This one's easy to answer. The trick is to use an empty WordPerfect user box as your placeholder. To avoid confusion and to make your placeholders visible, it's best to start with the text already in the document. Here are the steps you need to take:

- Place the cursor on the page where you want the box, then press <alt>-
 You'll see the Definition: User Box menu.
- Press TA<Enter> to anchor the box to the current page.
- 3. To set the box's vertical position, press **VS** and enter the desired distance from the top of the page in inches, then press **<Enter>**. Press **HS**, type in the horizontal position from the left edges of the page, and hit **<Enter>**.
- 4. To size the box, press SB, type a width measurement for the box, and press <Enter>. Then type a height measurement and press <Enter>.
 - 5. Finally, press WY<F7> to set text

wrapping and return to the editing screen.

To see how the printed page will look, press **<\$hift><F7>V**. You'll see a blank space on the page, with text wrapped around it, ready for the photographs you want to paste up.

Print Those WordPerfect Macros

Of the create long macros in Word-Perfect 5.1 for DOS, but I can't print the macro code. Is there any way to print the whole macro, other than using <hift>-<Print Screen> repeatedly?

Dr. August Nechi Stone Mountain, Georgia

A Every serious macro programmer needs to print listings, particularly of complex macros, but WordPerfect can't do it. Fortunately, shareware author David Seidman has an answer. Seidman's MacroAid is a set of utilities for WordPerfect 5.x for DOS macro gurus. One of them, MACASCII, converts macros to ASCII or WordPerfect files, Once converted, you can print the macros easily. Even better, you can edit a macro in WordPerfect or a text editor, then convert it back to a WPM file, bypassing WordPerfect's limited macro editor altogether.

Other MacroAid utilities allow you to search and replace in macros, create cross-reference lists, and change macro types. MacroAid's registration fee is \$25. You can find the program, as MACAID.ZIP, in the "Featured in February" area on PC World Online or you can also find it on CompuServe's Word-Perfect User Forum (GO WPUSER). Or request a copy of the program directly from David Seidman at, 2737 Devonshire Pl., NW, Washington, DC 20008.

Missing WordPerfect for Windows Fonts

I like to garnish my pages with a variety of typefaces, so I purchased Windows 3.1, WordPerfect for Windows, and a collection of fonts. When I start WordPerfect, however, I don't see any of the TrueType fonts. I know they are there, because the fonts show up in Windows Write but I can't find them. Can you tell me what happened to all of my fonts?

Shelley Yomano, Gainesville, Florida

A The problem is not in WordPerfect for Windows, but in the way it was installed. During installation, you opted to install the program for your old Word-Perfect for DOS printer drivers, which don't know anything about True Type. But the fix is simple.

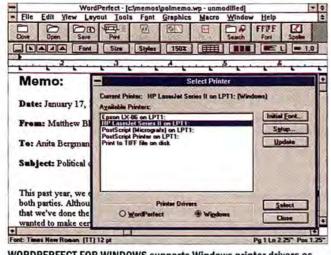
Start WordPerfect for Windows, then select File • Select Printer. In the dialog box, select Windows. In the Printer Drivers frame, highlight the Windows printer driver you want in the Available Printers list, then choose Select. Word-Perfect will take a few moments to update its font list. You will then return to the editing screen with your Windows printer driver as the new default and all your True Type fonts should be available for use.

If you see *only* TrueType fonts after doing this, and not your built-in printer fonts or other *Windows* fonts, you will need to do one additional thing. Exit *WordPerfect*, then fire up the Control Panel, and double-click the *Fonts* icon. In the dialog box, select *TrueType*, uncheck the Show Only TrueType Fonts in Applications box, then click *OK*. Finish the operation by selecting *Cancel*, then close the Control Panel.

Paging WinWord

I recently switched to Word for Windows 2.0 and ran into a problem with page breaks. As I type my document, Word for Windows doesn't insert page breaks automatically. Can you offer any suggestions?

Blaine K. Masumoto, Honolulu



WORDPERFECT FOR WINDOWS supports Windows printer drivers as well as native WordPerfect drivers. To use TrueType fonts, you'll have to open WordPerfect's Select Printer box and pick a Windows driver—otherwise, you won't have access to Windows' built-in fonts.



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Hardware Requirements.

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A It sounds like you're working in WinWord's Normal view, which displays your document as a continuous text stream. There are two quick solutions your Page Break dilemma. The easiest way to make Word for Windows display your document page by page is to select View • Page Layout, which paginates the file automatically.

If you prefer to edit in Normal view, you can still set up automatic pagination, but it's a touch trickier. Select Tools • Options • General. In the dialog box, select Background Repagination by clicking the check box or pressing Alt>-B, then click OK to finish the job and set the option as the default. From then on, pagination will be automatic; you'll see a dotted line in Normal view to indicate page breaks.

In Search of a Universal File Format

An upcoming project calls for me to send out disks containing a large document. This file will be opened by various types of word processors, but must retain its fonts, layouts, and overall appearance. What's the best approach to this problem, and is there a universal word processor format?

Chester Peterson, Lindsborg, Kansas

A Sadly, there's no true universal word processor file format. You need to take another approach and ship more than one file type.

If some or all of your recipients use Windows, create the document in a Windows word processor and save it as a Windows Write WRI file. Even if some of your recipients don't have Write installed on their systems, they'll still be able to load the file into any other Windows word processor. For DOS users, send a WordPerfect 5.1 file. With the notable exception of Microsoft Word 5.0, all major DOS and Windows word processors can import this format.

Then hedge your bets by sending a generic ASCII file, with carriage returns only at the ends of paragraphs. You'll lose your fonts and other formatting, but at least you're guaranteed that all users will be able to read the file. To save a file this way in WordPerfect 5.1, press <Ctrl>-<F5>AG, enter a file name,

and press **<Enter>**. In the DOS or Windows version of Microsoft Word, you can save the file using the Text Only option.

Finally, for maximum compatibility, keep your document as simple as possible. Use common fonts such as Helvetica, Courier, and Times Roman. Avoid multiple columns and stick to boldfacing and italies for emphasis.

Custom Templates for Windows Write

I use my word processor for one thing: writing letters. And for that, Windows 3.1's Write utility works just fine. The only thing I don't like about Write is that it always starts with the same settings, forcing me to change margins, fonts, and other defaults every time. Is there a way to force Write to start the way I want?

Bob Ward, Los Osos, California

A Windows Write is a surprisingly good little word processor for simple tasks like letter-writing, but there's no changing its fixed set of defaults. Still, there is a solution, and it's one that will work for any other Windows word processor.

Start by firing up Write, but don't load a document. Change your margins, fonts, and any other settings to suit your letter-writing style. You can even add boilerplate text, such as a signature line or a return address. Once you have things set up the way you want them, select File Save, type a generic file name such as LETTER, then click OK. Now, exit Write.

Next, open Windows' File Manager in a partial window, with Program Manager visible beneath. Locate and select your LETTER.WRI file in its file window. Select File Properties from File Manager's menu (or press <alt><enterline), check the Read Only attribute option, and select OK.

Now drag the highlighted file name with the mouse and drop it into an appropriate program group in Program Manager. A new Write icon will appear on your desktop with the name LET-TER.WRI beneath it.

The next time you want to write a letter, double-click this new icon. Since Windows associates WRI files with the Write application, Write will start and

load your LETTER.WRI file with all your layout and other choices intact. Now, here's the reason for that Read Only setting: When you try to save the new letter, Write will tell you that the file is write protected and will go to the Save As dialog box. Simply rename the file and you're finished.

The same trick works with all Windows programs, as long as the program has a file extension associated with it. You can create as many template files as you like, each with different settings, then turn them into icons for quick access from Program Manager.

By George Campbell

George Campbell is a contributing editor for PC World. He can be reached on PC World Online (for more information, see page 8).

Mail your word processing questions to Word Processing, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Word Processing; CompuServe, 71571,222; MCI Mail, GCAMPBELL; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

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POWER TIPno. 271

Command Line Search

The following command line will search a group of like-named ASCII text files for any occurrence of a given string, then write the search results to a file: FOR %A IN (filemask) DO FIND /N 'searchtext' %A outfile, where filemask defines what files to search (for Instance, '*.*' for all the files in the directory), searchtext is the case-sensitive text you're looking for, and outfile is the file you want the search results to be placed in.

You can automate this process by creating a one-line batch file called SEARCH.BAT: FOR %%A IN (%1) DO FIND /N %2 %%A%3. When you use SEARCH, pass your parameters to It as SEARCH filemask "searchtext" outfile. Unfortunately, with the batch file, the search text can be only one word.

Paul Stackhouse Lexington, Kentucky

Here's How

WINDOWS Q & A

Swap Meet

I want to speed up Windows on my 386SX by adding a permanent swap file, but am unsure how big to make it. My computer has 2MB RAM and a fair amount of disk space. What's the optimum size for my system?

Drew Carson, Mesa, Arizona

A In your situation, the best way to speed things up is to buy more RAM—Windows crawls in 2MB, and too large a permanent swap file will make it worse. For now, create a small permanent swap file (2MB to 4MB), then increase the size gradually if you get out-of-memory messages.

To create your swap file, or to change

its size, launch Control Panel from Program Manager's Main group, doubleclick on the 386 Enhanced icon, click Virtual Memory, and then click Change. In the resulting dialog box, accept Windows' recommended size or enter your own. If the size you enter is larger than the recommendation, Windows may not be able to use all of it. Once you've entered a size, click OK and follow the prompts to let Windows restart itself.

While permanent swap files are faster than temporary ones, all swap files slow down Windows when they're accessed. Windows puts running programs into a swap file when it needs more RAM than is physically available and must continually juggle programs between

memory and disk. Since writing or reading from even the fastest hard disk takes time, swap files hurt, rather than help, performance. If you have only 2MB of real RAM and a very large swap file, your computer will spend a lot of time accessing the hard disk.

Windows bases its recommended size on a number of factors, including the PageOver-Commit value in SYS-TEM.INI (more on that later), how much RAM you have, and the amount of available, contiguous free disk space. The easiest way to increase the possible. size of your permanent swap file is by increasing the PageOverCommit value in SYSTEM .-INI. Windows multiplies this value by system RAM (rounded up to the nearest 4MB) as part of its calculations for swap file size.

To change this value, first make a backup copy of SYSTEM.INI in case anything goes wrong. In either File Manager or Program Manager, choose File • Run, type SYSTEM.INI, and then press < Enter> to open SYSTEM.INI in Notepad. Search for the section that begins with the heading '[386Enh]'. Under that line, add a line that reads PageOverCommit=6, replacing the 6 with any number between 1 and 20 for your new multiplier (the default is 4). Save the file and exit and restart Windows.

Avoid multipliers over 8. The higher the number, the less efficiently Windows navigates the inside of the file, and more hard disk activity slows down your system. Keeping your multiplier and swap file size low should get you by until you can increase your RAM.

Tile the File

I like to display multiple windows in File Manager. When I use the Window Tile command, File Manager tiles my windows in horizontal rows, but I've seen other computers in my office with the windows tiled vertically. No one seems to know why. How can I make my windows tile vertically? Tony Mondello, Dallas

A By using the shortcut key instead of the menu. Keyboard shortcuts in Windows usually produce the same result as menu options, but this command is an exception. With two or three drive windows open in File Manager, choosing Window•Tile tiles the windows top to bottom. Pressing <Shift>-<F4> tiles them side by side.

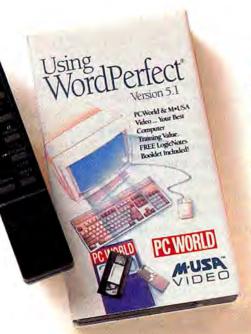
Norton Garbage

I'm trying to teach my parents how to use Windows, and I purchased Norton Desktop for Windows 2.0 to simplify their file management chores. One thing they haven't figured out is how to delete files. Can I put a Macintosh-like trash can on the desktop for them? Sandeep S. Bhangoo, Richmond, Indiana

Windows Toolbox



It's cheap, it's hokey, but it's extremely practical. It's WinLoad from Thomas Software. This shareware DOS (gasp) program lets you add a line to your AUTOEXEC.BAT so you can choose whether to start Windows automatically when you turn on your computer. If you ignore the warning sound and flash (you can turn off the fireworks) for a specified number of seconds, WinLoad loads Windows (and yes, you can specify your favorite command line parameters). Or you can strike any key to stop Windows from loading when you need to work at the DOS prompt. WinLoad comes with a companion program that loads DOS programs conditionally in the same manner. Be nice and pay the \$5 registration fee. Available on PC World Online and other online services (WINLOAD.ZIP), or from Thomas Software, 1375 Beasley Rd., Jackson, MS 39206.



Using WordPerfect 5.1

Discover all the features and keystrokes of this important word processing software. This video will show you how to use the pull-down menus to create, edit, and format text; set up headers and footers; and merge documents. The innovative training method takes a relaxed approach that makes learning easy and enjoyable for you and your colleagues.

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Microsoft Word for Windows Covers formatting tools, graphic interface & more.	Т-33-Р	747	\$2995		
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You can use Norton Desktop's SmartErase utility like a trash can and even make it look like one. If the SmartErase icon isn't already on the desktop, make sure the command SMARTCAN /ON is in your AUTOEXEC-.BAT file, and from the Norton Desktop menu, choose Configure • Preferences and check the SmartErase box. The Smart-Erase icon will appear on your screen. Click once on the SmartErase icon to open its pop-up menu (if no menu appears, choose Configure • Preferences • Advanced and check the Drive/Tool Icon Control Menu box), and select Icon. Now, from the Alternate Icon File drop-down list, select the file c:\ndw\ndw.nil (the path may be different depending on where you installed it). Scroll through the list of icons until you find and select a suitable trash can. and click OK.

Next, click the SmartErase icon again and choose Label from the pop-up menu. This dialog box lets you change the SmartErase icon label to Trash or whatever you like. Finally, choose Configure Save Configuration from the main menu.

Your parents can now delete files by dragging selected file names to the trash can icon. To undelete files, they must double-click the icon and locate the deleted file in the directory where it originally existed. They can then select the file name and click *UnErase*.

Get a Grid On

I use Paintbrush to make technical black-and-white sketches. Is there a way to put a grid system on screen that will not print?

Thomas J. Keilman, Griffith, Indiana

A I know a few Paintbrush tricks that will not only help with your grid, but can prove useful for just about any Paintbrush job. Before I explain them though, I must say you're using the wrong tool for the job. You'll find a charting or drawing tool much more useful; some of them, like Micrografx Draw, can be bought for as little as \$100. These programs, which understand the numbers behind the shapes, are much better suited to technical drawings than Paintbrush will ever be.

Getting back to Paintbrush, making the grid disappear before you print a file is easy, especially since your sketches are black and white. Simply draw the grid in a color other than black or white, and then change that color to white right before you print.

To avoid making the grid twice, save it immediately as GRID.BMP. To protect the file, select it in File Manager, press <alt>-<Enter> to see its properties, check the Read Only box and click OK. You can then make the file easily launchable by dragging it from File Manager into the Program Manager group of your choice. It will place a new PaintBrush icon in Program Manager, with the name Grid; when you double-click this icon, Windows will load PaintBrush and GRID.BMP. But since GRID.BMP is read only, PaintBrush will only let you save the drawings you make over the grid with other names.

Now create your illustration using black or any color other than the one you used for the grid. When you're ready to print, save the picture in case you want to modify it later. Move the mouse to the color palette at the bottom of the window and click the grid color with the left mouse button to make it the foreground color. Click on white with the right mouse button to make it the background color. Double-click the

Color Eraser tool (shown here). The grid will turn white and not print. Because

this conversion affects only the viewable portion of your picture, you may need to scroll around and double-click the Color Eraser for every view of your page (alas, choosing Zoom Out from the View menu does no good).

If, after printing, you need the grid lines returned, simply reopen your file without saving the current changes.

By Scott Dunn

Scott Dunn is a contributing editor for PC World and coauthor of 101 Windows Tips (Peachpit Press, Berkeley, California, 1992).

Mail your questions to Windows, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Windows; CompuServe, 74055,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

USER GROUP TIP

Getting Out of DOS Boxes Easily in Windows

By default, Windows can't close a DOS application; you have to exit the program through its own menus or command system. There's a good reason for this: Because Windows has no control over the program, it can't save your data files and exit cleanly. But this extra step can be annoying—especially when you want to close all your programs and exit Windows in one clean sweep.

Luckily, a simple change to a DOS applications' program information file (PIF) can change this: From Program Manager's Main group, double-click on the PIF Editor Icon and use File • Open to load the PIF file for the program you want to change. Press the Advanced button to go to the Advanced Options window. Once there, check the Allow Close When Active box. You'll get a warning about the dangers of this practice. Is it real? That depends on your work habits and the program in question. If you save to disk regularly, and if the program recovers gracefully from crashes, the danger is minimal. I've never messed up anything on my disk that could be attributed to this practice.

Once you've clicked OK to close the warning box, click OK again to leave the Advanced Options window, then save the file and exit the PIF Editor. When you next load the DOS program, you'll be able to close it from the Control menu or the Task List, as well as exit Windows without quitting the program first.

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DATA MANAGEMENT Q & A

Creating a dBASE III Plus Report Menu

I keep track of my customers with dBASE III Plus, and I have several reports that I need to print frequently. I'm not a programmer, but I'd like to create a simple menu for printing the reports so I don't have to go through the dBASE menus or deal with the dot prompt. I don't need anything fancyjust something that will let me print a report by pressing a keystroke or twoand I certainly don't want to hire a consultant. Can you advise me?

Tom Mitchinson, New York

It's easy to write a simple program A that will display a menu and print reports. Listing 1 gives you an example with three report choices, but you can revise it to include as many choices as will fit on your screen.

You can enter the program with any text editor or word processor that is able to create ASCII text files. Save it as RPTMENU.PRG. To use the editor that comes with dBASE (which isn't a very

good one), type MODIFY COMMAND rptmenu at the dot prompt, and press <Enter>. When you're finished, press < Ctrl><End> to save your file and return to the dot prompt. Or you can download the file from the "Featured in February" folder on PC World Online.

As you type the commands, replace the names of your data files after the USE commands and your report names after the REPORT FROM commands. Also, use numbers (or letters) and report descriptions that mean something to you after each SAY command.

To use the menu program, issue the command DO rptmenu at the dot prompt. To print a report, type the appropriate number; to quit the program and return to the dot prompt, press Q.

Here's what the various commands do: The DO WHILE at the beginning and the ENDDO at the end set up a loop; everything between them is repeated until you break the cycle by quitting. The CLEAR command clears the screen to ready it for the menu, and the @..SAY's place strings of text on the screen. The two numbers after each @ sign tell dBASE where the text should begin on the screen (the first number is the row and the second is the column). The WAIT command waits for you to press a key, then stores that keystroke in a variable called rptnum.

The DO CASE...ENDCASE sequence tells dBASE what to do, depending on what's in rptnum. If you press one of the three numbers, it opens a file and prints a report. If you press Q (the AT() function makes dBASE accept either an upper or lowercase Q), dBASE runs the EXIT command, which breaks the DO WHILE loop and exits your program. Any other key will simply repaint the menu.

Shane Stevens, Chicago

DO WHILE .T. CLEAR @ 10,30 SAY "1 - Customer List" @ 12,30 SAY "2 - AR Report" @ 14,30 SAY "3 - Follow Up Report" @ 22,30 SAY "Enter report # or Q to quit" WAIT TO rptnum DO CASE CASE rptnum = "1" USE Customer REPORT FORM Customer TO PRINTER CASE rotnum = "2" USE Ar REPORT FORM ARREPORT TO PRINTER CASE rptnum = "3" **USE Projects** REPORT FORM FollowUp TO PRINTER CASE AT(rptnum, "Qq") > 0 EXIT ENDCASE ENDDO

LISTING 1: A SIMPLE DBASE PROGRAM that lets you print reports from a personalized menu.

Floating Dollar Signs in Paradox

I'm having trouble putting dollar signs in front of currency fields in a Paradox report. I know I can simply type a dollar sign in front of a field, but

the result looks funny since all the dollar signs print in the same column, while the numbers they're supposed to be flush against, which align on the right, start in different places as their lengths vary. Is there a way I can make the dollar sign "float" with the value, no matter how wide the number is?

Franklin Tashlin, Kansas City, Kansas

If you have Paradox 3.5 or higher, you can use a calculated field to put a dollar sign right next to your currency field. Here's how to make the sign float:

From the Paradox Main menu, choose Report Change and select the table and report you want to work with. Once you're in Report mode, use Field • Erase to remove the currency field in question from the report (you are going to replace it with something better). If you still have a dollar sign next to the field, delete it with standard editing keys. Then use Field • Place • Calculated to create a calculated field that includes an expression such as FORMAT("E\$,W10.2",[Amount]), substituting the name of your currency field for Amount. Be sure to enclose the field name in square brackets. Follow the prompts to place the calculated field where the old field was. As you'll see when you use Output Screen, you now have a dollar sign to the immediate left of each value in the field.

Here's how it works: The expression for this calculated field uses the PAL FORMAT() function. FORMAT(), which changes the way Paradox displays or prints values, needs two parameters: a string of one or more special formatting codes, and the value being formatted. In this example, the string of codes is "E\$, W10.2", and the value is the contents of your field.

The string is always enclosed in quotation marks (unless you want to get really tricky and use a variable), and the codes within the quoted string are separated by commas. Two formatting codes are used in the example: E\$ has Paradox show the value being printed with a

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DATA MANAGEMENT Q&A

floating dollar sign; W10.2 says there can be up to ten characters printed, including two decimal places. If you need to print wider values, adjust the numbers accordingly—the first one must be big enough to include the decimal point and the decimal places.

The FORMAT function has additional uses, and it works in forms as well as reports. It can justify values, print leading zeros or signs, change the case of letters, vary date formats, and perform other magic

with your data. See the PAL reference manual for a complete list of FORMAT codes.

Borrowing a Field in DataEase

I noticed *DataEase* comes with a predefined form called Dictionary. When I looked at it, I saw that it includes common fields like Social Security Number, already defined and ready to go. Can I use the Dictionary fields in my own forms to save time? I tried typing in the name of a Dictionary

field after pressing <F10> to define a new field on a form, but that didn't work. Sue Kingsley, Mountain View, California

A The DataEase Dictionary is there for you to copy field definitions from during form design. You can use the Dictionary fields as they are, modify them, or add your own standard fields to the dictionary.

To include a Dictionary field in one of your own forms, choose Form Definition and Relationships from the Main Menu. Then create a new form, or open one you've already designed. Once in the form designer, move the cursor to the place where you want the Dictionary field and press <F5>. When you're prompted for the type of object you want to copy, type D for a dictionary field. Then select the field you want from the resulting pop-up list.

Once you copy a field from the dictionary, you can change its characteristics by pressing <F10> while the cursor is in the field you want to change. Once you have made your changes, press <F2> to save them and return to the form design. These changes will affect only the field in the current form; the Dictionary will remain unaltered.

You can also place your own field definitions in the Dictionary. Just modify the Dictionary form and add fields as you would with any other form. Place the cursor in an empty place on the form, press <F10>, use the Field Definition dialog as needed, and save your new field with <F2>. Any field you add can then be copied to other forms by pressing <F5> during form design.

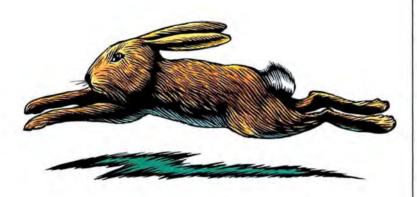
The *DataEase* Dictionary is a great time saver for adding groups of similar fields to forms. Instead of defining all the characteristics for each field, copy a Dictionary field and change it as needed for each new field.

By Celeste Robinson

Celeste Robinson is a PC World contributing editor and the author of The Paradox 4.0 Handbook (Bantam Computer Books, New York, 1992).

Mail your questions to Data Management, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Data Management; CompuServe, 74055,412; MCI Mail, 179-3813; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

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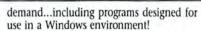
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PUBLISHING & PRESENTATIONS Q & A

Good-Looking Scans in PageMaker

I scanned a black-and-white logo for a brochure. Then, using *PageMaker*, I placed the scan on a page and reduced it to fit. For some reason though, the printed version looks distorted. What can I do to correct the problem?

Rajah Chacko, Apex, North Carolina

A The problem you describe is not unusual. The black-and-white dots that form scanned graphics often look off kilter after they've been *scaled* (reduced or enlarged). The way to avoid distortion is to maintain the image's original height-to-width proportions, also known as the *aspect ratio*.

For example, if you reduce a 4-by-6-inch graphic to fit a 3-by-3-inch space, you change the image's aspect ratio from 2:3 to 1:1—distorting it in the process. But if you reduce the graphic to fit a 2-by-3-inch space, you'll maintain the aspect ratio and get a smaller but otherwise exact duplicate.

Fortunately, *PageMaker* provides a built-in feature called "magic stretch" that maintains the aspect ratio as you

scale an image. To use magic stretch:

- Select the scanned graphic using the pointer tool, and point to one of its surrounding handles (the black squares at each corner).
- Press <Ctrl>-<Shift> and hold down the left mouse button. The cursor will change into a double-headed arrow.
- Drag the handle to scale the graphic, enlarging or reducing it, until the temporary outline surrounding the graphic is close to the size you want.
- Release the mouse button and PageMaker will proportionally scale the graphic to the size you indicated.

You often find proportional scaling tools in other applications. For example, Ventura Publisher users can use Frame • Sizing & Scaling and select the Aspect Ratio Maintained option. Likewise, Ami Pro users can use Frame • Graphics Scaling and select the Maintain aspect ratio option.

PowerPoint Text Tricks

When I create presentation slides, I like to use *PowerPoint 3.0*'s shape tool to create objects and fill them with

text. Then, whenever I move the object, the text moves along with it. Unfortunately, I can't always get the text inside an object to align the way I want. For example, I want to insert the words "New Sales Record" on three lines inside an arrow, with the first ("New") aligned left, the second ("Sales") centered, and the third ("Record") aligned right. But when I change the alignment for one line, the other two lines change as well. Is there any way to align each one individually? May Sui, Menlo Park, California

Attaching text to an object is a nifty way to draw attention to key points in your charts. And there is a way to align text the way you want it. All you need to do is change one of the default settings that control how text fits inside objects. Try these steps:

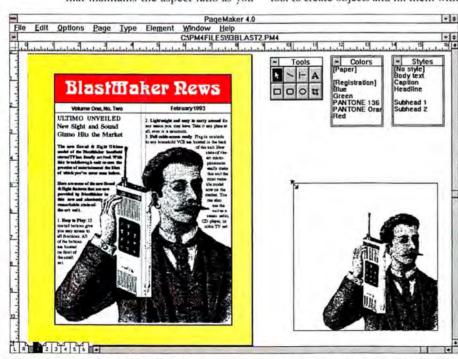
- Use the selection tool to select the object that contains the text you want to align—for example, the "New Sales Record" arrow.
- Select Text Fit Text to open the Fit
 Text dialog box, which provides several
 useful controls over the way the text is
 formatted in a selected object.
- Check the Word-wrap Text in Object box. Unless this option box is checked, all paragraphs attached to an object have the same alignment.
- Click OK to close the Fit Text dialog box.

Now you can select each separate paragraph (starting, for example, with "New") and use *Text* • *Alignment* to create the staircase effect you want.

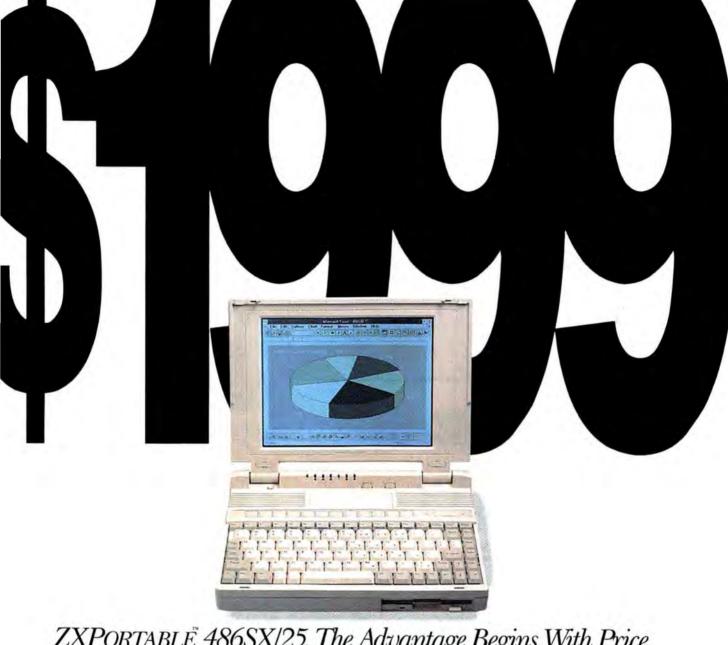
DTP on the Cheap

We're using *PageMaker* on a Macintosh to put out a simple four-page newsletter, with mostly text and a few graphics, on a PostScript laser printer. We'd like to move the procedure to a PC using *Windows* and also continue to use some of our existing art, including a logo and some clip-art files. Is *PageMaker* our only choice?

Dean Carriveau, Spokane, Washington



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PCW 0231



"Honorable mention" October 13, 1992



A While the Windows version of Page-Maker can translate Mac files complete with formatting, it's not your only choice for publishing your newsletter on a PC.

In the past year, there's been a boom in competent low-end desktop publishing packages available to Windows users. Priced from \$60 to \$250, these packages require less disk space and RAM than their highend cousins, and are generally easier to use. The list has grown to include ExpressPage (Carberry Technology, 508/970-5358), Express Publisher (Power Up, 800/851-2917), Microsoft Publisher (Microsoft, 800/227-4679), PagePlus (Serif, 603/889-8650), PFS: Publisher for Windows (Spinnaker, 800/323-8088), and Publish It (Timeworks, Inc., 800/323-7744).

As for transferring your Mac graphics files to the PC, stick with TIFF and EPS file formats, both of which are widely supported by PC and Mac applications. Finally, if you are unable to transfer the graphics files in your own office using a network, E-mail transfer, file translation program, or other method, have a service bureau do it for you.

Time-Stamping Ventura Documents

My office work group uses Ventura Publisher 4.0 to produce training manuals and other documents for a bank, and we have to keep accurate track of each draft. The problem is, every so often someone forgets to change the date on a revised version. Is there a way to print the current date in a Ventura document automatically?

Gregory Cyzcyk, New York

A Yes, you can insert the date and the time in a Ventura document automatically, but only in headers and footers. For example, here's how to place the current date and time in a two-line footer at the bottom center of the right page:

- Select Chapter Headers & Footers or press < Alt>CH to open the Headers and Footers dialog box.
- Check Define Right Page Footer and Usage On.
- Move the text cursor to the first line opposite Center, and enter [D] (Ventura's code for date).
 - 4. Move the text cursor to the next line

down, and enter [H] (for time).

Click OK to close the Headers and Footers box.

Ventura revises the date each time you open the chapter; the time, whenever you refresh the screen (for example, by pressing <Esc>) or print pages. To remove the date and time from the final document, delete the special codes in the footer.

By Richard Jantz

Contributing Editor Richard Jantz is a computer publishing consultant in Berkeley, California.

Mail your publishing and presentations questions to Publishing & Presentations, Q&A, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Publishing & Presentations; MCI Mail, RJANTZ; or 415/442-1891 (fax). Send make-over candidates, preferably clean and unfolded, to Publishing & Presentations, Make-Overs, at the above address. PC World pays \$50 for published questions or make-overs. Sorry, we cannot acknowledge unpublished materials.

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COMMUNICATIONS Q & A

Of Modems and Phone Cards

I'm having problems setting up my communications program to dial long-distance calling card codes. I need to dial an 800-access number, the long-distance number, then the calling card ID number. I put the 800 number in a dialing prefix and the calling card number in a dialing suffix. This should work but doesn't. What am I doing wrong? Steve Wilhite, The Colony, Texas

You've done nothing wrong. You've simply stumbled upon the paradox underlying all modem communications: Things should work, but they don't.

Most modems won't accept command strings longer than 42 characters. Yours might lack the space for a calling card number and all the necessary pauses (commas). Or it may refuse to dial after the long-distance carrier answers because it doesn't hear a dial tone.

To cut down on the number of commas, increase the time the modem pauses when it encounters a comma in the dialing string. In the modem initialization string in your communication software's modem setup screen is a string that begins 'AT . . . '. Insert **S8=10** at the end of that string (before ^M).

You also need to get your modem to dial numbers without hearing a dial tone first, so it can enter the phone number and calling card access number. You can do this by changing the ATDT command, also in your communication software's setup screen, to ATX10T.

I wrote a script that does all that and more. It's for Procomm Plus, but the scripting in your communications software is probably similar. Type the listing below into a text editor. In place of the x's, add the appropriate phone numbers and long-distance access codes. If you dial 9 or 8 to access an outside line, add it before the 800 number. Be sure there are enough pauses (commas) between numbers to navigate your long-distance carrier. Save the script in text mode with an ASP extension. Compile with Procomm's compiler by entering aspcomp filename at the DOS prompt in the Procomm directory.

To invoke the script with one keystroke, link it to a *Procomm* meta-key. Load *Procomm*, hit -M">Alt>-M, type R to select *Revise*, and use the cursor keys to toggle the file type to ASPECT. Then use Tab to get to *Contents*, type the file name without its extension, and save the settings. Now, to dial through your long-distance carrier, just load *Procomm* and hit the meta-key.

Catching Zs in XMODEM

An associate uses XMODEM to send WordPerfect files to other systems. The documents received have a number of ^Zs at the end. What are they? How can we get rid of them? Clyde E. Brinegar, Meridian, Idaho

A When you use the XMODEM protocol to transmit a file, it breaks it into 128-byte blocks. Those ^Zs

(<Ctrl>-Z, or ASCII 26, characters) at the end are the characters XMODEM adds to the last block in the file to pad its length to 128 bytes. You can delete them with your word processor or strip them with a utility that eliminates ^Zs or other high-bit characters. (There's one in the Featured in Feb-

USER GROUP TIP

Multiple Procomm Log Names

When I log onto a BBS, I like to save what I see on screen to a file so I can read messages and file descriptions off line at my leisure. With Procomm Plus, press <Alt>
<F1><Enter> to start capturing text into a file called PCPLUS.LOG. (To call it by another name, press <Alt>
<F1>, type the file name, and press <Enter>). To stop recording what's on screen, press <Alt>
<F1> again.

David Reed Central Kentucky Computer Society

ruary folder on PC World Online. It's called STRIPERS.EXE.)

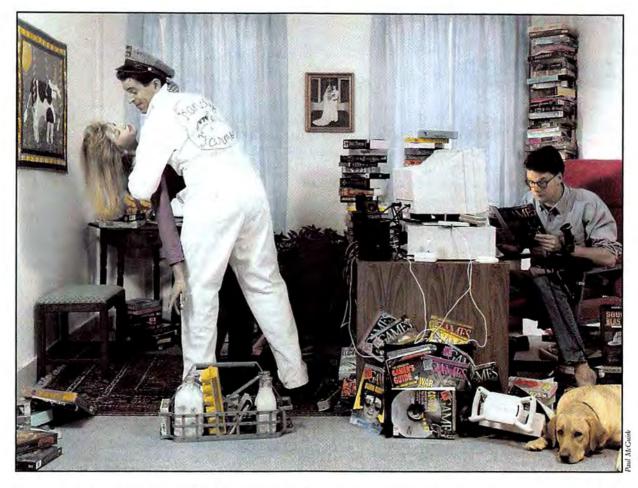
Even better, get your co-worker to switch to a more up-to-date error-correction protocol. Newer protocols don't need to pad the last block in the file, because at the start of the file transfer they send information on how large the transmitted file will be. Try YMO-DEM—an updated, faster version of XMODEM—or on clean phone lines, ZMODEM, which is even quicker.

By Judy Heim

Judy Heim is a contributing editor for PC World. She can be reached on PC World Online. For more information, see page 8.

Mail communications questions to Communications, PC World, 501 Second St. #600, San Francisco, CA 94107, or send them to PC World Online, Communications; CompuServe, 75300,713; Internet, 3127737@mcimail.com; MCI Mail, 312-7737; GEnie, JUDY.HEIM; 415/442-1891 (fax). We pay \$50 for published questions. Sorry, we can't acknowledge unpublished materials.

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STAR-DOT-STAR TIPS

My Old Familiar Shell

DOS 5.0's DOSSHELL makes it easy to start, stop, and switch between applications. However, every time you exit DOSSHELL, it saves your current setup—the window arrangement, the screen colors, even the currently selected line in the program list. This means that the screen might look completely different every time you start DOSSHELL—hardly desirable if you're a creature of habit or you share your computer with co-workers.

Here's how to avoid the problem. First, create two batch files, SHELL-SAV.BAT and DOSSHELL.BAT [Figure 1], in a directory that's in your AUTOEXEC.BAT's PATH statement. While running DOSSHELL, arrange

everything according to the way you prefer it, then exit DOSSHELL and rename DOSSHELL.EXE (which you can find in your DOS directory)

DOSSHELEXE.

Now run the command SHELLSAV from the DOS prompt. This will save a snapshot of the file DOSSHELL.INI, which your new DOSSHELL.BAT program can use. Now, when you type DOSSHELL at the DOS prompt, the shell will load with the saved configuration. If you wish to modify the standard configuration, simply set things up the way you prefer them and run SHELL-SAV.BAT again.

Doug Sharp, New Orleans

Editor's note: This technique is a great way to avoid confusion on any

machine that's used by more than one person—especially if those users are not highly computer literate. I modified Mr. Sharp's tip slightly so that users could simply type DOSSHELL in order to invoke the shell with the desired parameters.

SHELLSAV. BAT:

@COPY C:\DOS\DOSSHELL.INI C:\DOS\SHELLINI.SAV

DOSSHELL.BAT:

@ECHO OFF

REM DOSSHELL.EXE must be renamed to DOSSHEL.EXE COPY C:\DOS\SHELLINI.SAV C:\DOS\DOSSHELL.INI DOSSHEL

FIGURE 1: ONCE YOU'VE RUN SHELLSAV.BAT, DOSSHELL.BAT runs DOSSHELL with your saved configuration.

	A	В	C	D	E
1	\C	/rnctem	p		
2		{goto}{	?}-{Edit	}{?}-{g	oto}temp-
3		/rndtem	p-{quit}	1	

FIGURE 2: THIS 1-2-3 MACRO lets you move to any named range or cell, enter data, and return to the cell where you started.

	A	В	C	D	F	G	
1	/c	/rnctem	p				
2		{recalc	\C_1}		*		
3	\C_1	+"{goto}	Z*&@STR	ING (@CEL	LPOINTE	R("row"),0)&"	-
4		{Edit}{	?}-{goto	}temp~			
5		/rndtem	p-{quit}	}			

FIGURE 3: THIS VARIATION ON FIGURE 2 lets you write comments in a specified column of the current row.

A Comment Column for 1-2-3

I find it useful to keep a "comment" column at the far right in many of my 1-2-3 worksheets. As I enter and edit data, I often need to go to the comment cell for that row to explain the data. Splitting the screen isn't practical, because it doesn't leave enough room to show my longer comments. So I wrote a macro [Figure 2] that puts me in the comment cell for the current row and returns me to where I was after I hit <Enter>. The macro names the original cell "temp"; it then lets me enter a named range or cell to go to. After I have entered data in the comment cell, the macro returns me to the original cell and deletes the temporary range name.

Mark X. Saunders, San Diego

Editor's note: I made one small change to Mr. Saunders's macro: I inserted an {Edit} command so that when the macro stops at the comment cell, it will bring up the current comment rather than have you overwrite it.

I've also come up with a variation on the macro, shown in Figure 3. In my macro, the cell pointer moves to a specified column while staying in the current row. Use my macro if you're willing, for the sake of a few keystrokes, to keep all of your comments in the same column and always vertically aligned with what they're commenting on. Use Mr. Saunders's macro if you want a little more freedom.

Whichever macro you pick, enter it in an out-of-the-way place in your worksheet. Remember to precede every label that begins with a slash or backslash (/ or \) with an apostrophe. In other words, type in the first two cell entries as '\c and '/rnc temp~. If you use the Figure 3 macro, note that the 'Z' in the formula in cell A3 tells 1-2-3 to use column Z for the comments; you may want to change that letter. When you type in that formula, don't despair when what you get on screen looks very different from what's shown here—it's supposed to.

Once you've entered a macro, use /Range Name Labels Right to assign the labels in the left-hand column to the cells to their right. This done, pressing <Alt>-C will run the macro. Both macros are available in COMMENTS-.WK1, in the Featured in February folder on PC World Online.

Ready Rolodex

I prefer to keep my personal Rolodex inside an ASCII text file I named ROLODEX.TXT, where each line

The Evolution of CAD

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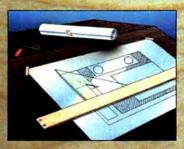
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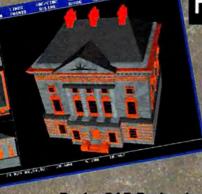
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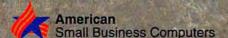


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STAR-DOT-STAR TIPS

contains a name and one or more phone numbers; for example:

 Bob Jones
 555-1234

 Bill Martin
 555-3366

 Deborah Smith
 (312) 555-0887

I handle this list with a simple batch file, R.BAT [Figure 4]. If I invoke the batch file with no parameters, it loads my Rolodex file into the DOS 5.0 editor. However, if I enter a parameter, as in **R Bill**, R.BAT returns all the lines containing that string.

You can even set up Windows to run this batch file: Use PIFEDIT.EXE to create a new PIF file, specify R.BAT as the Program Filename, and place a question mark in the Optional Parameters field; the question mark tells Windows to prompt you for one or more parameters before starting the batch file. Make sure the 'Close Window on Exit' box is unchecked. Save your new PIF file as R.PIF, and drag it from File Manager to Program Manager to create a new program item. If you like, you can change the program's icon-I'd recommend the telephone that comes with Program Manager-by elicking on the current icon, pressing <Alt>-<Enter>, clicking Change Icon, and selecting

@ECHO OFF

IF "%1"=="" GOTO EDIT

ECHO.

C:\DOS\FIND "%1" /I C:\DIR\ROLODEX.TXT

ECHO.

GOTO END

:EDIT

C:\DOS\EDIT C:\DIR\ROLODEX.TXT

:END

FIGURE 4: THIS BATCH FILE, R.BAT, lets you search and maintain a simple electronic "Rolodex" file.

the icon of your choice. David April, Chicago

Editor's note: Don't forget to save R.BAT to a directory that's listed in your AU-TOEXEC.BAT's PATH statement. And speaking of paths, don't use Figure 4 exactly as it appears; replace the DIRs with the path to your ROLODEX.TXT file.

Mr. April's batch file uses DOS 5.0's EDI'T program to edit the Rolodex file. If you don't have DOS 5.0, or if you prefer another editor, change 'EDIT' in the second to the last line with your editor's executable file name. Also, note that the search

string should not contain spaces, semicolons, or other characters that have special meaning on a DOS command line.

R.BAΤ is available in the Featured in February folder on PC World Online.

Bouncing Buffers to High Memory

In the DOS 5.0 manual, Microsoft recommends that you use the command BUFFERS=50 in your CONFIG.SYS file if you have a hard disk with a capacity of 120MB or more. What they don't say is that using 50 buffers when you're loading DOS high will significantly reduce the amount of lower memory available to run programs. On my own 486 system, BUFFERS=50 leaves me with 25K less of my precious low memory than BUFFERS=44.

The reason is that DOS allocates all of its buffers in one contiguous block of memory. If you tell DOS to load itself high, it tries to put the block in the high memory area (HMA), but there is only space in the HMA for 44 buffers! If you specify more, then all the buffers are allocated in low memory, and part of the high memory area is wasted.

The moral: If you're currently allocating more than 44 DOS buffers, try reducing the number. You might get an extra 25K or more low memory, and disk access won't slow down noticeably as a result.

Michael Hanson, Seattle

Editor's note: Mr. Hanson is correct: Using slightly fewer than 50 buffers will give you a good chunk of free conventional memory and won't slow disk access down significantly. But 44 may not be your magic number. At the *PC World* offices, we got one system up to 47 buffers with no ill effects. The moral: Ex-

periment. If you're concerned about the impact of fewer buffers on your system, consider installing a cache such as Super PG-Kwik.

By the way, most third-party caches are far better than SmartDrive 3.0 (the cache that comes with MS-DOS 5.0) and will improve the performance of your disk dramatically.

Windows Detection Redux

In the September 1992 Star-Dot-Star, you offered a batch file that aborts itself when run from a Windows DOS session. By using

such a batch file to enter Windows 3.0, you could avoid accidentally loading Windows from inside itself. Even in Windows 3.1, which protects users from making that mistake, this type of batch file can be a useful way to launch programs—like a defragger or low-level utility—that are dangerous to run inside Windows.

There's a problem with the technique described, however: It works by searching for a file that matches the pattern WIN?86-.SWP. But if the user has created a permanent swap file, there may not be a SWP file on the disk.

Here's a simpler way to tell if you're in Windows: In your batch file, insert the command EXIT before the program you don't want to run in Windows. For instance, if you might launch Windows 3.0, check with a batch file that contains the lines

EXIT

If you're in plain old DOS, the EXIT command will do nothing and the batch file will keep running. But if you are in a Windows DOS session, the EXIT command will terminate COMMAND.COM and will take you back to Windows.

Brian Deschene

Callander, Ontario, Canada

Editor's note: 'Tis true, alas: As several readers have reported, if you have created a large permanent swap file, or are running with no swap file at all, searching for WIN?86.SWP won't tell you if you're in Windows or not. Mr. Deschene's EXIT technique is more likely to succeed, because it will always terminate a "temporary" instance of COMMAND.COM (the kind Windows invokes) but not a "permanent" instance (the kind DOS sets up when you boot).

There are two caveats, however: First, if you run the batch file from a subsidiary shell—for instance, from an application program—the EXIT command will terminate the batch and the shell that's running it, returning you to the application. This isn't necessarily a bad thing, though; because Windows needs all the memory it can get, it's not a good idea to run it from a subsidiary shell. The second problem: Because the EXIT command ends the batch file, there's no way to print a message saying that the batch terminated because you were in Windows. The user may therefore

be mystified when the command just stops! The two batch files are available in the Featured in February folder on PC World Online.

Stealth Icons

If you'd rather not have other people know about some of the programs you're running from the Windows Program Manager, you can create an invisible "stealth" icon that doesn't show on screen. To other people, it's not there at all; only you know what double-clicking on that blank spot will do.

First, use an icon editor (such as the ones that come with Norton Desktop for Windows, hDC Icon Designer, or Visual Basic) to create an icon that's a solid block of the background color of your Program Manager windows. Then open the Windows Control Panel, double-click on the Colors icon, and set the color of the Active Title Bar to match the window background color. If this makes the Active Title Bar text disappear, choose a new, contrasting Active Title Bar Text color as well.

Now you're ready to prepare the icon. In Program Manager, click once on the icon you want to hide and press <Alt>-<Enter> to bring up the File Properties dialog box. Enter a single space character in the File Description field. Click the Change Icon button, and enter the path and file name of the icon you've just created as the File Name. When you're finished, the program's icon won't be visible, but you will still be able to invoke it by double-clicking on the right spot.

Daniel S. Rambles, Red Bud, Illinois

Editor's note: This is a clever way to hide a program's icon. However, if you use it in conjunction with Program Manager's autoarrange feature, make sure your "stealth" icon is the last one in its group. Otherwise, the telltale gap will give it away.

Also, since giving the Active Title Bar and the window background the same color keeps Program Manager from highlighting the title of the focused icon, you may not want to make this change. Luckily, you don't have to. If you keep your old Active Title Bar color, the tip will still work, with one limitation: The icon will give itself away if it currently has the focus, either from someone clicking on it or moving to it with cursor keys.

One more suggestion: If you highlight the

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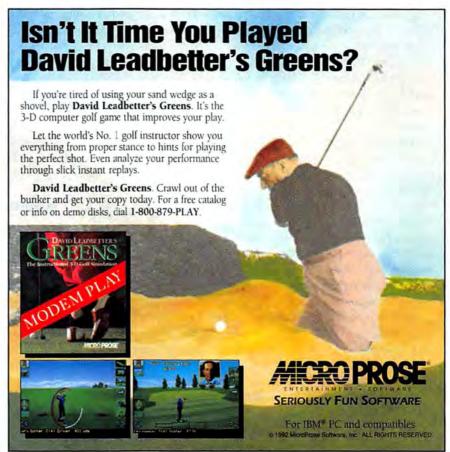








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STAR-DOT-STAR TIPS

invisible icon and press <ahl>Enter>, you'll have the option of giving the icon a hot key. This can save you the hassle of stumbling around, looking for something you've hidden too well for your own use.

Untying NOTs in WordPerfect

Most programming languages have an IF NOT statement—that is, a way to execute a statement if a condition is false. WordPerfect's macro/merge language doesn't have an obvious construct of this kind; however, you can create one by using the {IF} and {ELSE} statements in succession. For example, if you want to execute a statement only when the variable KChar does not have the value 32, you can write:

```
{IF}{VARIABLE}KChar~=32~

{ELSE}

{;} Put the statement here~

{END IF}
```

William J. Wolfe, Champaign, Illinois

Editor's note: If you don't use this trick, you might very well tie yourself up in "nots." It works because WordPerfect's macro language allows a statement between an {IF} and an {ELSE} or {END IF}, but doesn't require one. Mr. Wolfe's technique essentially executes a null statement if the condition is met, and a different statement otherwise.

The macro in Figure 5, PERSPACE-.WPM, demonstrates this technique while it checks a document for periods that aren't followed by two spaces. Since a period doesn't always end a sentence, the macro queries the user before adding a space. To create it, press <Home>, then <Ctrl><\F10>. At the Define Macro prompt, type perspace and press <Enter>. At the Description prompt, type Check for single spaces and press <Enter> again. You're now ready to create the macro.

In the WordPerfect macro editor, you must insert different types of commands in different ways. To insert a command shown here in boldface, press <Ctrl>-<Page Up>, select the command from the pop-up list in the upper right corner of the screen, and press <Enter>. If a command is shown underlined, press the appropriate key (for example, F7 for

```
{ON NOT FOUND}{QUIT}-
{ASSIGN}Check-1-
{WHILE} {VARIABLE} Check-=1-
 {ASSIGN}Char--
 {Search}. . {Search}
 {ASSIGN}KChar-{KTON}{SYSTEM}Right---
 {ASSIGN}SChar-{SYSTEM}Right--
 {IF} {VARIABLE}KChar-=32|
       {VARIABLE}KChar-=32778|
       {VARIABLE}KChar-=32781|
       {VARIABLE}KChar-=32780-
       {ELSE}{Left}{Left}
       {Block}{Right}{Right}
       {CHAR}Space-Insert · Space? · (Y/N)~
       {IF} "{VARIABLE}Space-"="Y"|
             "{VARIABLE}Space-"="y"-{Block}.
       {ELSE}{Block}
       {END IF}
 (END IF)
{END WHILE}
```

FIGURE 5: PERSPACE.WPM, WHICH SEARCHES for periods followed by single spaces, demonstrates IF NOT statements in WordPerfect's macro language.

{Search}). For commands that are shown boldface and underlined, press <Ctrl>-V, then the appropriate key (for example, <Ctrl>-V then <Enter> for {Enter}). It's important, in this particular macro, to keep an eye out for blank spaces, which are shown in this listing—as they are in the macro editor itself—as dots. Type any other text as it appears. When you're finished entering the macro, press <F7>.

You can run the macro by pressing <alt>
<F10>, typing perspace, and pressing <Enter>.
PERSPACE.WPM is available in the Featured in February folder on PC World Online.

By Brett Glass

Brett Glass is a contributing editor for PC World.

Have a macro, batch file, short program, or general tip you're proud of? Mail your tips to Star-Dot-Star, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to PC World Online, Star-Dot-Star; Internet, rogue@well.sf.ca.us; MCI Mail, PC World Editorial, CompuServe, 74055,412; or 415/442-1891 (fax). PC World pays \$25 to \$200 for each tip used. Sorry, we cannot acknowledge unpublished materials.

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PC WORLD

Instant Reference Card #33

For use with PC World Instant Reference Card Portfolio

PROCOMM PLUS 2.0 (DOS)

You invoke Procomm Plus commands primarily via <Alt>- or <Ctrl>-key combinations or by using the mouse and a pulldown menu. You can also automate commands with the program's meta keys and script language. Press <Esc> to exit menus.

The Terminal Mode screen is your main work space. All commands begin from this screen unless otherwise noted. The status line at its bottom shows the current terminal emulation, duplex mode, baud rate, and line settings, as well as log file, print, and on-line/off-line status. Keys to press are shown here in boldface. Keys to press simultaneously are joined by hyphens.

SETUP AND SUPPORT

These key combinations represent Procomm Plus's housekeeping functions. They help you use other functions, set up the program, and automate tasks.

<Alt>-Z

See function list and keystrokes Get help about Terminal Mode

<Alt>-Z<Alt>-Z

screen

Get help about another screen

Go to screen, <Alt>-Z

Activate pulldown menu Set seconds to wait for

<Open Single Quote>(')

connection/pause between calls

<Alt>-S. Modem Options, General Options, A/B, number (0 to 999), <Enter>

Set number of dialing attempts

<alt>-S. Modem Options, General Options,

G, number (1 to 999), <Enter>

Here

Set dialing command

<Alt>-S. Modem Options, Modem Commands, B, type command, <Enter>

Set connect/no-connect string

<Alt>-S, Modem Options, Result Messages, letter (A to K), type message,

<Enter>

Set default terminal emulation

<Alt>-S. Terminal Options, A. select emulation category, <Enter>, select

emulation type, <Enter>

Set default duplex mode

<alt>-S, Terminal Options, B, <Space> to

to half or full

toggle, <Enter>

Turn line wrap/screen scroll

<Alt>-S, Terminal Options, E/F, <Space>

on or off

to toggle, <Enter>

Set terminal screen width to 80

<Alt>-S, Terminal Options, L, <Space> to

or 132 characters

toggle, <Enter>

Set display buffer size (in K)

<Alt>-S, Display/Sound Options, H, number (1 to 63), <Enter>

Set terminal/window colors

<alt>-S. Color Options, Terminal/Window Colors, type feature's letter, <Up> or

<Down> to select color, <Enter>

Set default baud rate

<Alt>-P, number (1 to 9)

Set default parity

<Alt>-P, letter (N, E, O, M, or S)

Set default data bits

<Alt>-P, <Alt>-7 or <Alt>-8

Set default stop bits

<Alt>-P. <Alt>-1 or <Alt>-2

Set default comm port

<Alt>-P, function key (<F1> to <F8>)

Save changes and exit port and line settings menu

<Alt>-S

Initialize modem

<Alt>-J

Reset terminal

<Alt>-U

Edit text

View clipboard

<Alt>-A <Alt>-<Equal Sign> (=)

Enter host mode

<Alt>-0

DIALING DIRECTORY

The dialing directory is your electronic phone book and supports 200 entries. Each entry holds the telephone number, the speed, the terminal emulation, the parity, and the number of data and stop bits of the modem you're calling. For all dialing directory commands, first open the directory using <Alt>-D.

Go to entry

G, type entry number

Find entry

F, type entry number

Go to adjacent entry

<Up> or <Down>

Go to beginning

<Home>

Go to last page

<End>

Go up/down ten entries

<Page Up>/<Page Down>

Create new entry

Go to blank entry, S

Make notes about entry

Go to entry. J. jot notes. <F5>Y

Revise entry

Go to entry, R. Change or don't change parame-

ter, <Enter>; repeat for all parameters

Dial entry's phone number

Go to entry, <Enter>; or D, type entry number

Manual dial Print all entries M, type phone number

Sort entries by name

S

WORKING ON LINE

Send file

<Page Up>, choose protocol, type path/file

Fold

name, <Enter>

Receive file

<Page Down>, choose protocol, type path/file

name. <Enter>

Enter Chat mode

<Alt>-0 <Alt>-Q

Enter Host mode

<Alt>-Y Toggle auto-answer on/off

Pause/resume scrolling

<Alt>-N

Go to DOS shell

<Alt>-<F4>

Return from DOS shell

EXIT<Enter> at DOS prompt

Show file directory

<Alt>-F

Change current directory

<Alt>-<F7>

Turn logging to file on/off

<Alt>-V, type path/file name <Alt>-<F1>, type log file name

Pause/resume logging

<Alt>-<F2>

Send break

<Alt>-B

Toggle duplex mode Toggle line feeds

<Alt>-E

Toggle record mode

<Alt>-<F3> <Alt>-R

Enter Monitor mode

<Ctrl>-<Backslash>

Take screen shot

<Alt>-G

Redisplay text

<Alt>-<F6>, <Up> or <Page Up> <Alt>-H

Quit Procomm Plus

<Alt>-X

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Instant Reference Card #33

For use with PC World Instant Reference Card Portfolio

PROCOMM PLUS FOR WINDOWS

All commands begin at the Terminal window unless otherwise indicated. Use <Ctrl>-<Tab> or a mouse click to switch between Terminal, Setup, and Directory windows. Keys to press are shown here in boldface. Keys to press simultaneously are joined by hyphens. A bullet (*) separates menu, option, and button names.

THE ACTION BAR

Use Action Bar buttons and drop-down list boxes to invoke commands. The number of buttons Procomm shows depends on the resolution of your screen.

Button/list box	Task	Keyboard
1	Open/close default dialing directory	<alt>-D</alt>
Repid Dial: Compuserve	Dial entry shown or entry in list	<alt>-R, select entry if necessary, <enter></enter></alt>
3	Run script shown	<alt>-<period> <enter></enter></period></alt>
Script File:	Run script in list	<alt>-T, select script, Enter></alt>
	Open/close Setup window	<alt>-S</alt>
亘	Review/continue session	<alt>-P</alt>

SETUP AND SUPPORT (continued)

Set default baud rate Baud rate, select baud rate

Set default parity Port settings, Parity, select choice, OK Set default data bits Port settings, Data, select 7 or 8, OK Set default stop bits Port settings, Stop, select 1 or 2, OK

Set default comm port Connection · Advanced!, select modern, Port,

select port, OK . OK

DIALING DIRECTORIES

Use <Alt>-D, Action Bar's Directory button, or Window • Dialing Directory to open and close the default dialing directory. Or use <Alt>-<F4> or File • Exit to close it. For all but the first two tasks below, open a Directory window first.

Open another directory File • Open Dialing Directory, select directory, OK Create directory File • Create Dialing Directory. In Directory window:

File · Save As, type name, OK

Add entry Edit • Add New Entry

Go to entry Click entry number; find entry; or use cursor keys

Find entry Edit • Find, type name, Find

Dial entry Double-click entry number; or go to entry, <Enter>

Fold

Open/close File Clipboard Open Send File

<Alt>-<Equal Sign>(=)

File . Send File

dialog box Open Receive File

dialog box Open/close Capture File · Receive File

File

<Alt>-<F1>

Start/stop print logging

<Alt>-N

<Alt>-<F2>

SETUP AND SUPPORT

<Alt>-Z or Help • Contents Open Help contents

Hang up

Get context-sensitive help Select item <F1>

Window . Custom Colors, select screen element, Set colors select color, OK

Initialize modem <al>Alt>-I or Communication • Initialize Modem.

<Alt>-U or Edit • Reset Terminal Reset terminal

The Setup Window

Use <Alt>-S. Action Bar's Setup button, or Window • Setup to open and close the Setup window. You can also use <Alt>-<F4> or File • Exit to close it.

Set connect/no-connect

Set default duplex mode

Connection, select modem, Advanced! . Modem Setup, select string, type string, OK • OK

Set default terminal

emulation

Terminal, select emulation

Turn line wrap/screen scroll on or off

Port settings . Duplex, select mode, OK Terminal, select emulation, Advanced! • Line wrap/Screen scroll • OK

Protocol, select protocol Set default protocol

Manual dial

Manual Dial, type phone number, OK Revise field in entry Cursor to field, <Space>; or double-click field

Go to entry, Edit . Delete Entry Delete entry

<Ctrl>-S or Edit . Sort Sort entries <Ctrl>-L or File . Print Print entries

Set seconds to wait for connection

Dial · Options · number (5 to 99) · OK

Set number of connection attempts

Set seconds to pause

between attempts

Dial . Options . Wait . number (0 to 99) . OK

Dial · Options · Make · number (0 to 999) · OK

WORKING ON LINE

Ouit Procomm Plus

Send file Send character File . Send File, type or select file name, OK Double-click character in Terminal window

File · Receive File, select file name, OK Receive file Enter Chat mode <Alt>-O or Window • Chat

Enter Host mode <Alt>-2 or Host meta button

<alt>-Y/<alt>-Q; or Communication • Auto Auto-answer on/off Answer On/Off

<aht>-<Right Bracket>(1) or Scripts • Start/Stop Start/stop recorder Recorder

<Alt>-1 or DOS meta button Shell to DOS EXIT<Enter> at DOS prompt Return from shell <alt>-B or Communication • Break Send break

<Alt>-C or Edit • Clear Screen Clear screen Start/stop print logging <ah>t>-N; Action Bar button; or File • Print Capture

Review/continue session <Alt>-P or Edit • Scrollback/Pause <Alt>-<F2> or Communication • Hang Up Hang up <Alt>-X; <Alt>-<F4>; or File • Exit

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New Products (page 83)	0	0	0	0	0	0	0		
Marketplace (page 111)	0	0	0	0	0	0	0		
25 New 486s: Quest for the Best PC (page 1	16)	0	0	0	0	0	0		
Are Upgrades Worth It? (page 152)	0	0	0	0	0	0	0		

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First name												
Last name												
Daytime phone number				-				-				
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5	_	00	0		0	0	0		0	0	0	00
7		0	0		0	0	0		0	0	0	0
8	_	0	0		0	0	0		0	0	0	0
9		00	00		00	00	00		00	0	0	00
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			Leas	t			Most
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Home Office (page 310)	0	0	0	0	0	0	0
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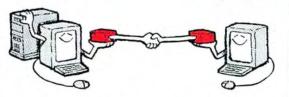
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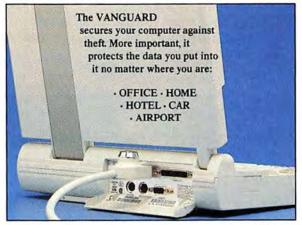
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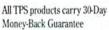
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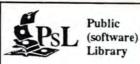
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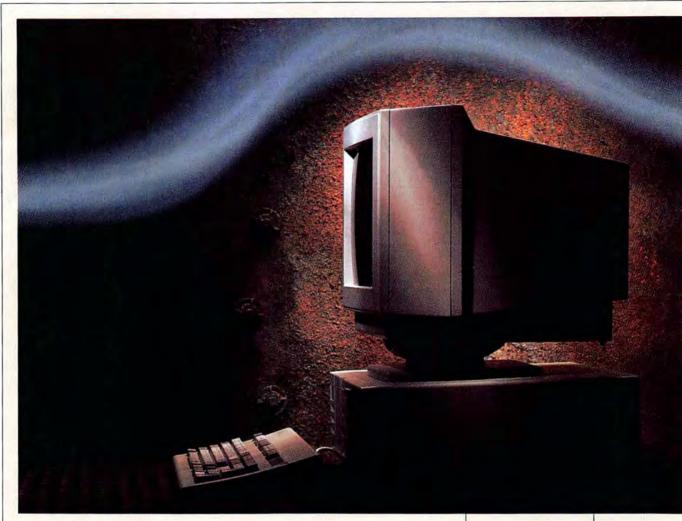
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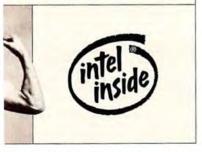


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901 902 903 904 905 906 907 908 909 510 911 912 913 914 915 916 917 918 919 920 955 Accounting software

Advertised Products

February 1993

- 951 Desktop computers
- 952 Notebook computers
- 953 DTP/Presentation software
- 754 Monitors and video boards
- 959 Multimedia products 960 Utilities
- 956 Draw/paint software 957 Network/sharing products 958 Printers
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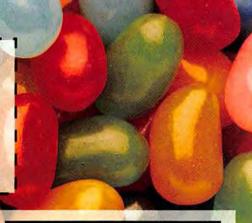
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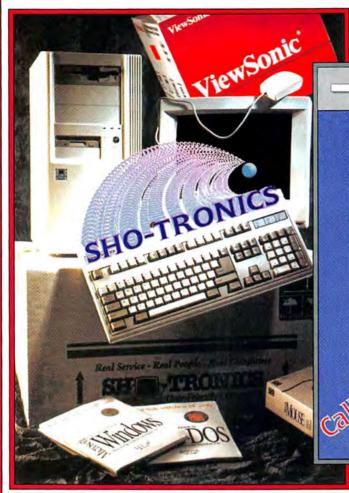
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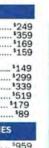
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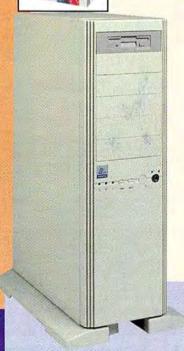
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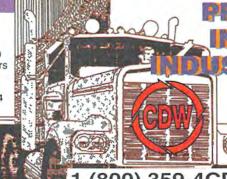
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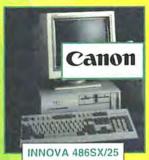


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The Power and the Personal

t was Saturday, and the UPS truck had been gone less than an hour, but the new arrival—a 66-MHz 486DX2—was already in operation and attached to my *LANtastic* network. That's how eager I was.

The MIS system was joining several other "power" products: a budget-minded Compaq ProLinea 4/50 and a super-smart QMS 860 printer, newly arrived for my monthly *PC World* hands-on roundup review. To top things off, I had one piece of software to put to use, *Lotus Organizer 1.0*.

As I stuffed ethernet and modem cards into the MIS machine, many questions raced through my head, all boiling down to one key question: Would I "feel" the difference? Mind you, 486 power is not new to my office. My daily work machine is a Cheetah Gold 425—a 25-MHz platform—once the hottest performer on the market.

MIS (MicroNiche Information Systems) is not a brand-name clone builder but more an assembler. The firm takes the broad specifications of a client and assembles off-the-shelf products into a complete system. Although MIS will assemble a machine for any single user, its big business has been with Fortune 1000 companies, the Pentagon, and NASA.

My broad specifications had called for a "power" system. What I received were two shipping boxes; one with a Morse 17-inch 1280-by-1024-capable monitor, the other containing a roomy 24-by-8.5-by-17-inch tower chassis and a Maxiswitch 124 Pro keyboard. A \$4195 package.

The power was inside the tower, of course—a Micronics motherboard with eight slots (two of them VESA local-bus slots) driven by Intel's clock-doubled i486DX2 CPU with an internal processing speed of 66 MHz. (That puts it a step above the twenty-four 486DX2-50

By Thom Foulks

systems PC World reviewed in October 1992, though many of those machines can accept the newer CPU.) On board are 256K of instruction cache memory, 16MB of RAM, an IDE controller, a floppy drive controller supporting 2.88MB drives, and one parallel and two serial ports. An ATI Graphics Ultra Pro (an updated version of the Best Buy featured in our March 1992 video accelerator review)

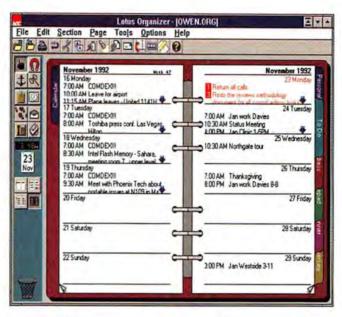
graced one local bus slot. And the IDE controller was hooked to a top-performing Quantum LP240A hard drive.

A Resounding Yes

The Micronics system board manual is sparse but well-written. It took me only a few moments to learn what I needed to turn off the board's serial ports so they wouldn't conflict with my cards—BIOS switches from the setup menu. While I waited, cleaning up the shipping box materials from the floor of my office, *LANtastic* was moving much of my standard software from the Cheetah to the MIS 486. (For the record, *LANtastic* moved 1120 files—28.1MB—between the two 486s in 5 minutes, 10 seconds.)

Ready to work, I brought up Windows 3.1. It was the allure of running Windows at 1280 by 1024—coupled with the CPU power to overcome Windows' slowness on lesser platforms—that had sparked my interest in the machine in the first place. My big question remained: Would I feel the difference?

The answer is a resounding yes. As I type this in Word for Windows 2.0, at 200 percent zoom with a DOS window open alongside, I finally have enough



power to match the promise of so many newer software products. The key hardware component here is the ATI controller, in the VESA local-bus slot. The Video Electronics Standards Association specification for

Foulks's Favorite: Lotus Organizer helps you keep your life in order.

local bus provides the controller a 32bit, motherboard-speed data path to the CPU. Clearly, the local bus (or Intel's competing PCI standard) will soon be a fixture of new motherboard designs.

Though for my own basic writing and telecommunications needs, the MIS 486 is power-wasting overkill, a CAD architect on a LAN might find it just the tool for an easier, speedier work day. MIS delivers lifetime toll-free support via telephone and offers a number of other support options.

Compaq ProLinea 4/50

Nearby on the power spectrum, but considerably lower in price, the Compaq ProLinea 4/50 is a machine closer to my needs. The Compaq left me no setup to ponder. I just lifted its 14-inch 1024 by 768 monitor, small-footprint CPU unit, keyboard, and mouse from the box, plugged them in, and flipped the power switch. After I followed some menu-driven setup instructions, the familiar *Windows 3.1* logo popped up on the screen. Almost too easy. I felt I'd been deprived of a challenge (honest, Compaq, I'm only kidding).

I also needed to link the ProLinea to my LAN, so I found my special Compaq screwdriver and opened up the box. Big surprise. I had expected (and had been prepared to tolerate) some lessening of the traditional Compaq hardware quality. After all, at \$2800, this machine—with 6MB of RAM, two floppy drives (1.2MB and 1.44MB), plus monitor—is a deal. Compaq has to have cut costs somewhere. If those cuts were in hardware, though, it's not evident. The interior layout of components, even to cable routing, bespeaks forethought and follow-through.

A 486 motherboard of only 8 by 9.5 inches with a three-slot expansion bus mounted vertically shows Compaq's experience at shrinking circuit boards into silicon. A Tseng Labs video chip is on board, along with ports for the keyboard, mouse, two serial devices, and one parallel printer. At its heart is a clock-doubled i486DX2, operating at 50 MHz. This machine could find work on my desktop any day.

Lotus Organizer 1.0

There's only one notable fault I can find with *Lotus Organizer*—you can't choose your own on-screen display font. I will hope for that capability in a later version (Lotus says it is "under consideration") because I've converted my 3000-plus name and address list to *Organizer*; and there it will stay.

Organizer is a PIM —personal information manager. The key word here is personal. Can it be customized to your needs? For example, I need help keeping track of many hundreds of people with whom I've made contact, not only this year, but last year and the year before. I want to be able to find their names and any notes I filed about them and to dial their phone numbers with minimal effort. I just don't need a trip planner, a daily to-do list, or a multientry monthly calendar with pop-up

reminders. These are all found in *Organizer*, but I rapidly whacked them out of my implementation.

My version of the PIM lets me flip open the Day-timerstyled phone book on my screen,
mouse-click to the "T" pages, click to
John Thomas's name, and drag and
drop the name on the phone icon. I
confirm the call with another key click,
and it's on its way. The call gets logged
automatically; I'm offered the chance to
write a note about the call, and another
click drops Organizer into an ever-ready
icon on my Windows screen.

Organizer is the one PIM I've used that doesn't dictate what information I should store or try to anticipate how I will use it. Personal, yes, and for sure a Foulks Favorite (especially in use on the ProLinea).

QMS 860 Print System

Add "input power" to the list of criteria by which to compare laser printers. The QMS 860 not only has it, but the firm has also redefined ESP to mean an "emulation sensing processor" with its own form of extrasensory perception. An Intel RISC chip makes this printer smarter than some of the computers that may use it.

With the 860 hooked to my LAN's print server, I sent print jobs to it from three different machines within seconds of each other. One file was normal DOS text, one file was a graphics-laden Post-Script Level 2, and the third was for an HP LaserJet II. All three files printed properly-no fuss, no muss-and at 600-dpi resolution, with rich black tones and crisp gray-scale dots. In its Post-Script emulation mode (Level 1 or Level 2), the 860 has the usual 35 builtin Adobe PS-compatible fonts as well as four typefaces from the Helvetica family. If you're not on a LAN, you can still share this 8-page-per-minute printer: Various interface options allow simultaneous input from the parallel port, the serial port, an AppleTalk port, and a Novell NetWare port. Through the parallel port, I printed an 86-page Windows document in just over 10 minutes.

The Compaq left me no setup to ponder. I just plugged in its monitor, CPU, keyboard, and mouse and flipped the switch.

Then I switched to the 11-by-17-inch print tray and sent a two-page newsletter layout to it from WinWord 2.0. The 860's 12MB of on-board RAM gulped it in and gave me a press-ready printout moments later.

At a list price of \$4595, however, the QMS 860 is high on the price curve, especially when compared to the HP LaserJet 4 (\$2199), a much cheaper, though less powerful, machine. Look for a good dealer's price on this one.

Quick Fixtures

Products should never be fully judged on their beta versions, but Delrina Technology's WinFax Pro 3.0 has the best integrated optical character recognition of any such package currently on the market. In several tests with fax-modem-generated fax files, my beta copy with the menu-driven Caere Any-Fax OCR module achieved conversion accuracy marks close to 100 percent. Previous versions of WinFax were a Foulks Favorite; this might be a repeat.

. Compaq ProLinea 4/50

Compaq Computer Corp. 713/370-0670

Reader service no. 725

Lotus Organizer 1.0

Lotus Development Corp. 617/577-8500

Reader service no. 726

MIS 486DX2/66 Computer System

MicroNiche Information Systems, Inc. 800/733-9188

Reader service no. 727

. QMS 860 Print System

OMS

800/523-2696

Reader service no. 728

WinFax Pro 3.0

Delrina Technology 800/268-6082

Reader service no. 729

Thom Foulks is a freelance programmer and former business computer services consultant living in Colorado Springs, Colorado.

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* DESQview makes multitasking and windowing available to users of 286-class machines with similar memory efficiencies through QEMM-50/60 for IBMTM PS/@ 50 and 60 users and QRAM for other 286 users. Colored control of their respective owners.

Follow the Leader: Tribal Chief or Indiana Jones

ivilization, an immensely complicated (and hopelessly habit-forming) game from Micro-Prose, provides great on-the-job training for being God. Even if you're not interested in that particular job, this fascinating simulation delivers superb mental exercise for the kind of high-powered executive who masterminds two hostile takeovers before breakfast. In fact, the empire-building skills needed to win *Civilization*—long-term planning and acute attention to detail—bear an eerie similarity to those of a good manager.

You begin as a tribal chieftain in the dim mists of the primeval past, founding a city and trying to make it grow. You must find a site with good resources and trade options, decide what to produce and how to sell it, and set priorities among defense, economic growth, and your people's contentment. If that isn't complex enough, you'll need to start a religion, choose the most effective form of government, create an irrigation system for your fields, and scout the countryside for trading partners and dangerous enemies.

Moreover, you're in a race with several other tribes to reach the stars. If that sounds far-fetched, keep listening. The time line of this game may start in the distant past, but if you can manage to avoid a barbarian takeover or a Communist revolution along the way, you can pilot your city-state into the modern industrial era—and beyond.

If you make thoughtful choices, inventions and technical breakthoughs will get you from pottery, writing, and iron-working all the way to spaceships and the colonization of Alpha Centauri. Though advisers are present to help you, you'll need to read not one but two long, detailed manuals in order to stand a chance of winning—or even outlasting—the barbarians.

By Michael Goodwin

The playing interface takes practice. While the basic metaphor-a map-is simple enough, your cities and their armies. diplomats, and explorers are represented by a bewildering variety of icons. Sometimes the icons blink; sometimes they move by themselves; sometimes they refuse to move. Once in a while they disappear just when you need them (often leav-

ing behind a newspaper headline announcing, for example, that food riots at home have made it economically unfeasible to support military units).

The manuals are long on theory ("a cathedral is very useful for keeping a large city out of civil disorder"), but surprisingly short on practice. They badly need a section that lists all the different icons and how to use them. Figuring out the right combination of mouse and keyboard actions to put your newly built warship in the water, for instance, can take far too much trial and error.

Given the intricacy of the game, though, it's not surprising that it takes a while to learn. There are already books you can buy to help you play better (such as *Civilization*, or *Rome on 640K a Day*). And be warned: This is probably not a good game to get into if you have other goals in life—like eating, working, or sleeping.

Why Should I, You Fat Tub of Lard?

If Civilization springs from an academic/historical tradition, there's no secret about the origin of Indiana Jones and the Fate of Atlantis. LucasArts Games' delightful comedy-adventure is the most purely cinematic computer game I've ever played.

The story and "screenplay"-both



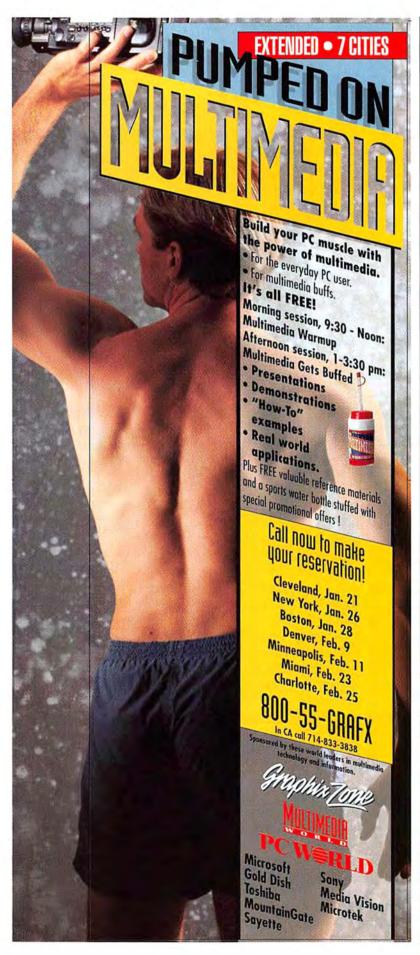
written by ace screenwriter/filmmaker Hal Barwood, who co-wrote Sugarland Express, Steven Spielberg's first film—are loaded with snappy dialog. For instance, when Indy runs across a big bully who won't let him into a theater, you can choose between a gracious apology and a highly provocative insult. The wiseguy put-down is so irresistible, you may not

is the biggest trick in Civilization. It might be nice to have a pyramid, but building it takes a lot longer than constructing a catapult.

notice that sweet-talking your way past the bruiser (or simply knocking him out) is a lot more effective. Even if cracking wise slows your progress down a bit, it makes the adventure a lot more entertaining.

You can choose actions as well as dialog with a swift click of the mouse. And in between brawls and travel to distant places you'll find yourself watching a series of exciting, tightly scripted setpieces; they're short films really, that turn your PC screen into a private theater, providing essential information and advancing the plot.

That plot isn't very weighty, of course. Set during World War II, it involves the usual collection of Nazi



spies, feisty sidekicks, exotic locales, and eccentric vehicles. But like the films that inspired it, the point of *Indiana Jones and the Fate of Atlantis* isn't high drama—it's low entertainment. And does it deliver!

One of the nicest touches in this game is that it's actually three games in one. Many role-playing adventures offer only one line through the tale. If you go back for another run, it's déjà vu city. Indy Jones provides a neat solution. Early in the story, just after you've gotten your bearings (and met your feisty sidekick), you're presented with a choice of three tracks: Play the rest of the game as a team; go it alone, using your brains to solve problems; or push toward victory as a solo act, using brute fisticuffs. Some sequences occur on all three paths; others don't. No matter which path you choose, saving the game just before you make the decision lets you play out the alternative tracks another time, after you've finished your chosen version.

But whether you proceed as a single or a double, by brains or by brawn, don't start this game on your lunch break—unless you're prepared to take the afternoon off.

Civilization \$69.95; MicroProse Software Inc.; 800/879-7529

Reader service no. 720

Indiana Jones and the Fate of Atlantis

\$59.95; LucasArts Games; 800/782-7927

Reader service no. 721

Michael Goodwin is a contributing editor for PC World. He can be reached on PC World Online (see page 8 for more information).



Making Cents in WordPerfect

WordPerfect 5.1 includes some very helpful and easy-to-use character keys. For instance, for the fraction ½ or ¼, press <Ctrl>-V and type in /2 or /4, respectively. For the cent sign, use <Ctrl>-V and /c (the c must be lowercase). For the trademark and registered trademark symbols, press <Ctrl>-V and type TM and ro (uppercase or lowercase, respectively).

In WordPerfect for Windows, use <Ctrl>-W instead of <Ctrl>-V.

> Judy Heim Contributing Editor

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Confessions of a Gadget Junkie

kay, I admit it. I like gadgets.
There's nothing better than a cheap gizmo that solves one problem, no matter how small. Here are some of my favorite little pieces of hardware:

Have you ever picked up the phone while you're in the middle of downloading an enormous file, breaking the connection and forcing yourself to start over? I hate it when that happens. It's Busy is a neat little gadget by Pacific Ideas that sits beside the phone and flashes a red light whenever the line is in use, warning you not to pick up the phone. It's essential if there's more than one phone sharing the line with your modem. • It's Busy \$12.99, Pacific Ideas; 619/530-2879, 619/530-2878 (fax). Reader service no. 710

One of these days, I'll invest in a second line so that my fax-modem and phone don't have to share. But for now, I use a Command Communication's ASAP TF 333 line manager to sort out the barrage of incoming calls. For a street price of about \$120, the ASAP TF 333 is smart enough to distinguish between a fax and voice call. If I'm not able to answer the phone, it will even direct the call to my answering machine. You'll need to step up to the \$179.95 ASAP TF 555 if you have a separate fax machine and modem. ASAP TF 333 \$139.99, Command Communications; 800/288-6794; 303/

Prevent Global Warming

751-7000. Reader service no. 711

Most people are surprised when they discover the heat a 486 chip produces— in fact, touching the CPU can actually burn your finger. Add-in boards, like fax-modems or memory expansion cards, and extra RAM all add to the heat inside the case. And hardware's two worst enemies are—you guessed it—heat and power surges.

by Steve Bass

That's why I installed a Fan-Card, a slim expansion board that has two thin fans inside. The burden on the power supply is minimal—less than five watts—and installation is easy. For about \$50, the next time you turn the computer on, the fans will cool things down to a suitable temperature, extending the life of your system. • Fan-Card \$99.95, T.S. MicroTech, Inc.; 310/787-1640. Reader service no. 712

I have trouble keeping my desktop lamp's glare off the monitor. The solution? Light-

Man, a slick computer keyboard light that slides under my monitor and shines on both my keyboard and the surrounding desk area. The LightMan uses a 40-watt incandescent bulb so there's no fluorescent flickering. • Light-Man \$39.95, Micro Pulse Electric; 914/628-4038, 914/628-5365 (fax). Reader service no. 713

A Kit for All Seasons

In the past, every time I had to pull a chip or change cables, I had to spend ten minutes looking for the right tools. But with a Curtis Tool Kit, I have all the small screwdrivers, chip pullers, needle-nose pliers and pin straighteners I'll ever need, demagnetized and neatly organized in a vinyl case. The 11-piece set can be found discounted at about \$20. But if you've ever dropped a screw into the case-something I never doget the larger set. For a discounted \$50, it includes-among other tools-a handy device for retrieving lost screws. · Curtis Computer Tool Kit \$29.95-\$79.95, Curtis Manufacturing; 800/955-

On occasion I eat lunch at my desk, so I protect my keyboard from spilled coffee, sandwich crumbs, and other vestiges of my meals with SafeSkin, a

vice no. 714

5544, 603/532-4123 (fax). Reader ser-



form-fitting, plastic cover. While I'm aware of its presence, it doesn't slow down my typing and I can still feel the reassuring snap of the keys. SafeSkin is available for more than 1000 keyboard models so it's very likely you can find one that fits yours. • SafeSkin \$29.95, Merritt Computer Products, Inc.; 214/339-0753, 214/339-1313 (fax). Reader service no. 715

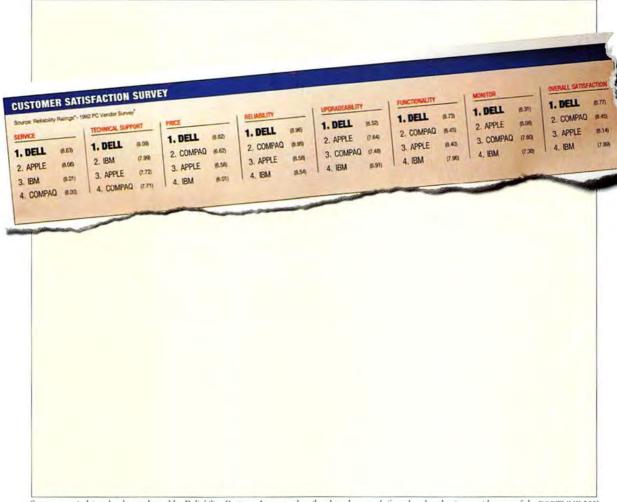
I sometimes finish working late at night and don't want to stay awake staring at the monitor while the computer backs up and optimizes my hard disk. To turn off the computer at a specified time, I use the Intelligent Power Module, a \$59 gadget that sits between the power outlet and the computer (or power strip). Via special software and a bundled cable, Power Module lets you set up your computer to turn itself off.

• Intelligent Power Module \$59, Server Technology, Inc.; 800/835-1515, 408/988-0142. Reader service no. 716

All this just goes to show you, software solutions aren't always the best solutions. Sometimes, a gadget really is worth a thousand lines of code.

Contributing Editor Steve Bass is the president of Pasadena IBM Users Group. He can be reached on PC World Online (see page 8 for more information).

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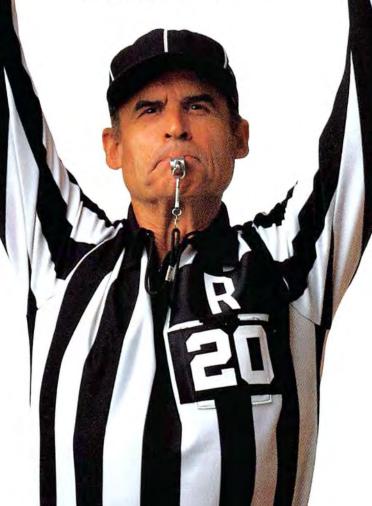
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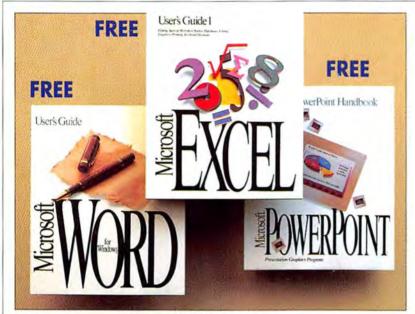
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