PCs MEET WAL-MART: ADVICE FOR BUYING A MASS MARKET PC

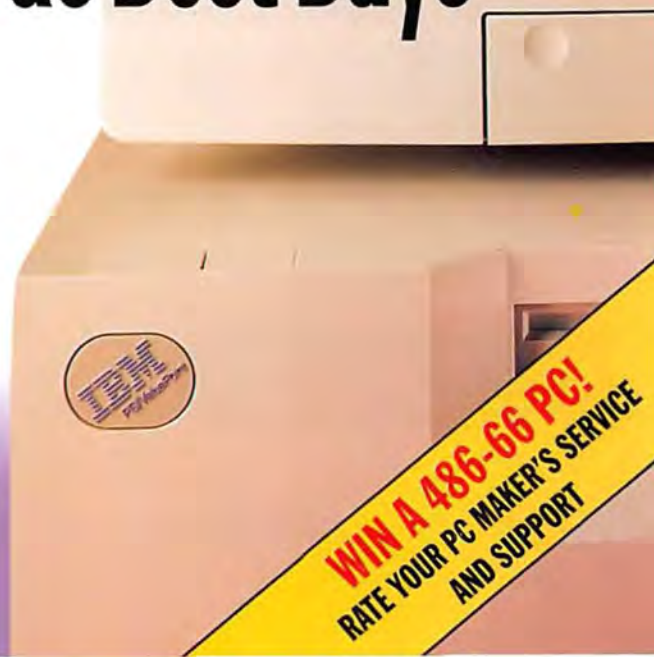
PC WORLD

January 1994 $3.95

POWER PLAY

Pentiums Bump 486s as Best Buys

Plus: Choosing the Right DOS
Ink Jet Printers From $275
Top Personal Finance Software
Is Disk Compression Safe?



WIN A 486-66 PC!
RATE YOUR PC MAKER'S SERVICE AND SUPPORT

team for their comments. Or use our enhanced Scenario Manager to work with others projecting different business scenarios.

Designed to work together with all our programs.

Software never worked like this before. With new OfficeLinks, you never have to leave your work to use any program in the Microsoft Office.

For instance, you can drag and drop a Microsoft Excel chart into a Word document, then click on that chart and have your spreadsheet tools ready to go.

With Microsoft Excel 5.0, we're introducing Visual Basic™ for Applications, the powerful development environment for the Microsoft Office. Now custom business solutions are yours for the making.

To see why it's the world's most popular spreadsheet, visit your local reseller or call (800) 426-9400, Dept. KU9, to find one near you. Because if you don't have Microsoft Excel 5.0, it's time to raise your standards.

INTRODUCTORY OFFER

MICROSOFT EXCEL VERSION 5.0 $99*
For licensed users of a previous version of Microsoft Excel.

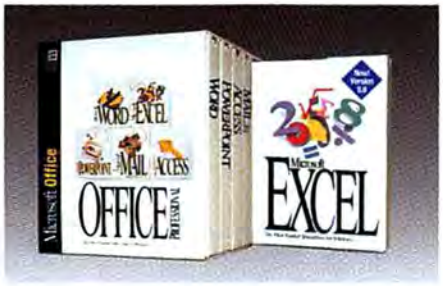
MICROSOFT OFFICE STANDARD EDITION VERSION 4.0 $259*
For licensed users of at least one qualifying Microsoft Office program.*

Microsoft Office

SET A NEW STANDARD.
INTRODUCING MICROSOFT EXCEL 5.0.

Microsoft Excel works the way you do. Use Drag-and-Plot to instantly update your charts by simply dragging new data straight in.

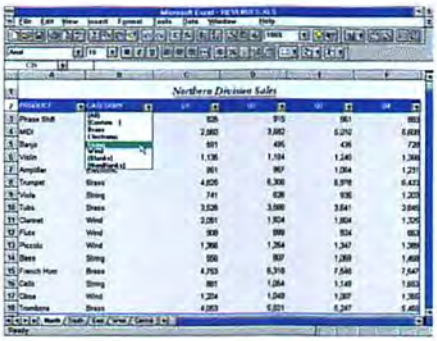
r the Microsoft Access' database management system. Offer good only in the 50 United 36-8661. © 1993 Microsoft Corporation. All rights reserved. Microsoft, Microsoft Access



Intelligence that works for you.

It's always been the spreadsheet by which others are measured. Now it will be even harder to match the thinking in new Microsoft® Excel 5.0 for the Windows™ operating system.

One big reason is our unique



Want to quickly browse through your information? AutoFilter lets you pick the information you need and filter out the rest.

Outlining lets you collapse and expand details of your worksheet while the Subtotal feature adds your numbers automatically.

IntelliSense™ technology. It's in all the programs in the Microsoft Office family. It senses what you're doing and knows how to help you do more, with a lot less effort. Everyday jobs are automatic, complex jobs are a snap.

TipWizard tracks the way you work and offers bright ideas on how to save time.

New Microsoft Excel 5.0 lets you quickly browse through your information. Click on AutoFilter, and this spreadsheet shows you exactly what you want to see. On the spot.

Want to add specific groups of numbers? Let the Subtotal feature do it for you automatically. Or hit the Outlining buttons and you can instantly expand or collapse the details of your worksheet.

And the Drag-and-Plot feature lets you put new data into your charts by just dragging and dropping the numbers onto the chart itself.

An easier way to analyze your work.

New Microsoft Excel is the one spreadsheet with innovations that help you analyze data the way you want.

Take our great new PivotTable.™

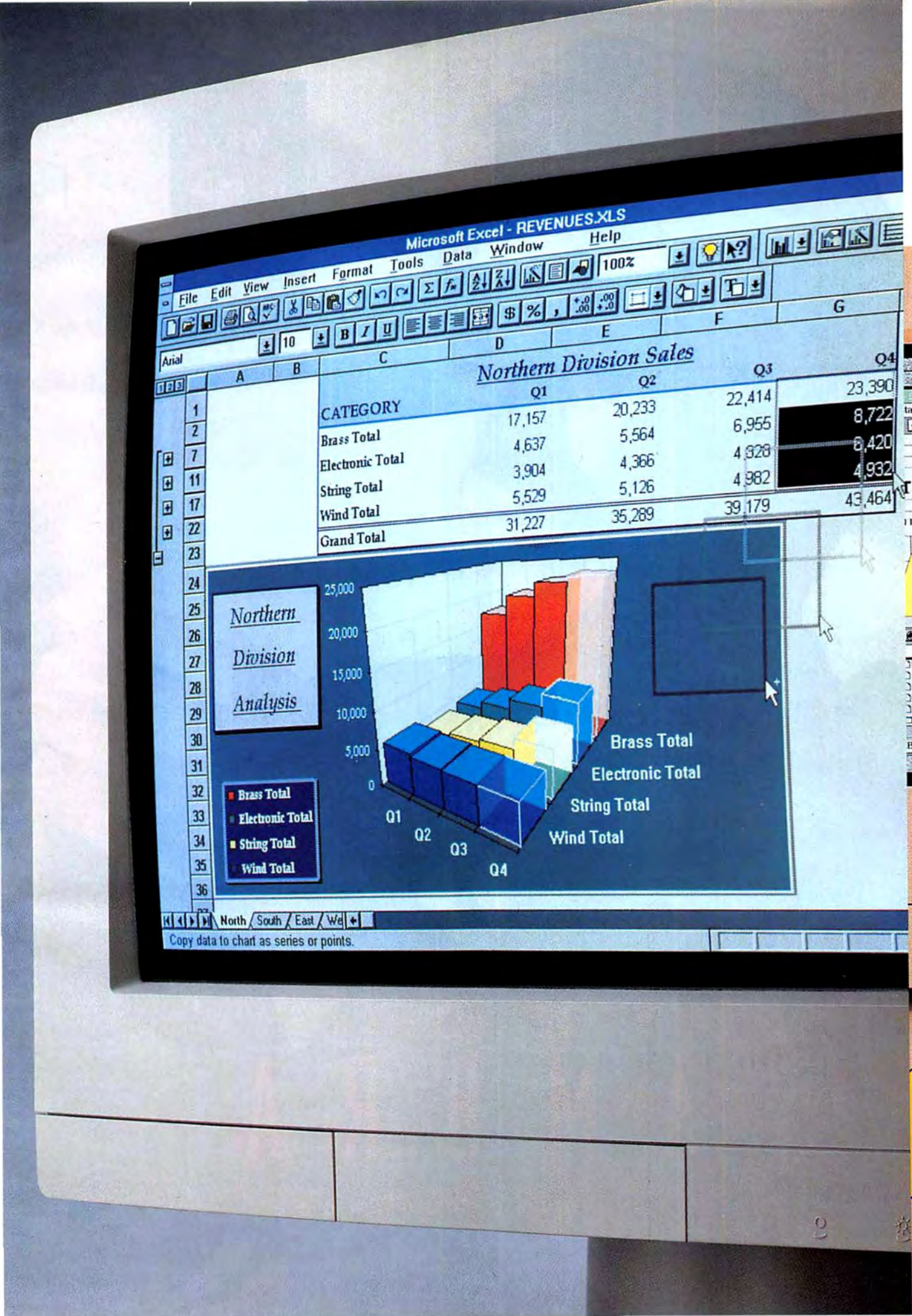
First the PivotTable Wizard guides you easily through the initial layout of your report. It pulls your raw numbers together, performs calculations and gives you a summary table that's easy to understand.

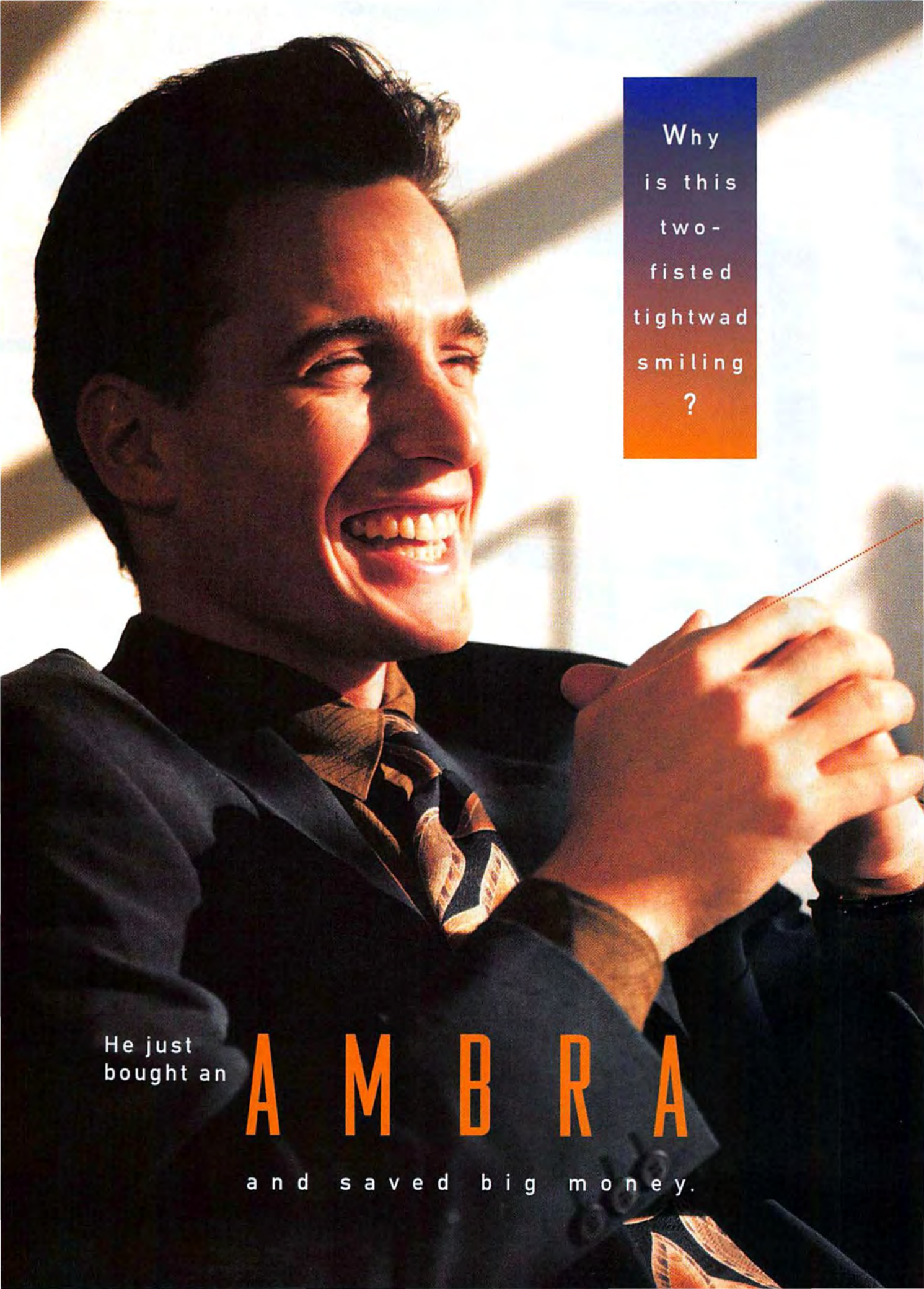
PivotTable lets you analyze your numbers from all different perspectives. Just drag and drop different headings into your worksheet to instantly rearrange your work. Then PivotTable recalculates the report to show your data in a whole new light.

Click on the Workgroup toolbar and route your work to the entire

*Offer for Microsoft Excel expires March 1, 1994. Offer for the Microsoft Office expires February 1, 1994. Qualifying Microsoft Office programs: Microsoft Excel, Word, the PowerPoint® presentation graphics program
States. Reseller prices may vary. In the 50 United States, call (800) 426-9400, Dept. KU9. In Canada, for information only, call (800) 563-9048. Outside the U.S. and Canada, call your local Microsoft subsidiary or (206)
and PowerPoint are registered trademarks and IntelliSense, PivotTable, Visual Basic and Windows are trademarks of Microsoft Corporation.

AFTER YEARS OF
SETTING THE SPREADSHEET
STANDARD, THERE WAS ONLY
ONE THING LEFT TO DO.


Microsoft Excel - REVENUES.XLS
File Edit View Insert Format Tools Data Window Help
Arial 10
Northern Division Sales
CATEGORY Q1 Q2 Q3 Q4
Brass Total 17,157 20,233 22,414 23,390
Electronic Total 4,637 5,564 6,955 8,722
String Total 3,904 4,366 4,928 8,420
Wind Total 5,529 5,126 4,982 4,932
Grand Total 31,227 35,289 39,179 43,464
Northern Division Analysis
25,000
20,000
15,000
10,000
5,000
0
Q1
Q2
Q3
Q4
Brass Total
Electronic Total
String Total
Wind Total
North South East
Copy data to chart as series or points.


Why is this two-fisted tightwad smiling?
He just bought an
AMBRA
and saved big money.

NOTEBOOKS

LIGHTWEIGHT

MODEL SN425C

- 486SX, 25 MHz, SL-Enhanced
- 4MB RAM
- 170MB hard disk
- 7.8" STN color screen
- 1 PCMCIA slot, Type II
- Parallel and serial ports; external keyboard, monitor and diskette drive ports
- 86-key keyboard
- Integrated 16mm trackball
- Suspend/Resume
- NiCad battery
- MS-DOS® 6.0, Windows™ 3.1
- 4 lbs, including battery

$1,899

(Monochrome models available at $1,399. With external 3.5" 1.44MB diskette drive, add $99.)

NOTEBOOKS!

MODEL N450C

- 486DX2, 50 MHz
- 4MB RAM
- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" STN dual-scan color screen
- 1 PCMCIA slot, Type III
- Parallel and serial ports; external keyboard and monitor ports
- 86-key keyboard
- Integrated 16mm trackball
- Suspend/Resume
- NiCad battery
- MS-DOS 6.0, Windows 3.1
- 6.6 lbs, including battery

$2,699

For HOT computers at hold-onto-your-cash prices, call AMBRA™.

You CAN have it all!

BLUE LIGHTNING

MODEL D466BL

- 486 Blue Lightning,™ 66 MHz
- Upgradeable to Intel® Pentium™ technology
- 4MB RAM
- 256KB processor cache
- 3.5" 1.44MB diskette drive
- 340MB hard disk
- Onboard SCSI
- 5 16-bit ISA slots (2 VESA on local bus)
- Windows accelerator, 1MB video memory
- 15" Flat Square color monitor, LR, NI
- Network-ready (Ethernet 10BaseT)
- MS-DOS 6.0, Windows 3.1, mouse

$1,895

(For 8 x 6 minitower, add $75.)

MODEL S450DX

slimlines

- 486DX2, 50 MHz
- 4MB RAM
- 128KB processor cache
- 3.5" 1.44MB diskette drive
- 340MB hard disk
- 3 ISA slots (2 VESA on local bus)
- 3 storage bays
- Windows accelerator, 1MB video memory
- 14" SVGA color monitor, LR
- MS-DOS 6.0, Windows 3.1, mouse

$1,699

DESKTOPS

Model D466DX

- 486DX2, 66 MHz
- 8MB RAM
- 256KB processor cache
- 3.5" 1.44MB diskette drive
- 340MB hard disk
- 8 ISA slots
- 6 storage bays
- Windows accelerator, 1MB video memory
- 2X CD-ROM drive
- 15" Flat Square color monitor, LR, NI
- MS-DOS 6.0, Windows 3.1, mouse

$2,495

MODEL DP60/PCI

- INTEL PENTIUM PROCESSOR, 60 MHZ
- 64-BIT DATA PATH
- 8MB RAM
- 256KB PROCESSOR CACHE
- 3.5" 1.44MB DISKETTE DRIVE
- 340MB HARD DISK
- 4 ISA, 2 PCI, 1 PCI/ISA SLOT
- 6 STORAGE BAYS
- PCI GRAPHICS ACCELERATOR, 2MB DRAM
- 14" SVGA COLOR MONITOR, LR
- MS-DOS 6.0, WINDOWS 3.1, MOUSE

$2,799

Free customization. AMBRA custom-configures to your exact specs — with no extra service charge and no delay.

More systems to choose among! Call soon!

Firm confidence. Every AMBRA comes with a 30-day money-back guarantee and a one-year limited warranty. An optional IBM® one-year onsite warranty is also available.[1] With either warranty, you can rely on toll-free technical support around the clock.

Full convenience. To place an order or get more information, just call any weekday 8 am to 9 pm, or Saturday 10 am to 6 pm (ET). We accept Visa,® MasterCard® and American Express® — as well as purchase orders from qualifying businesses. Pick up the phone today!

AMBRA™

In Canada,[2] call 1-800-363-0066, Ext. 5728

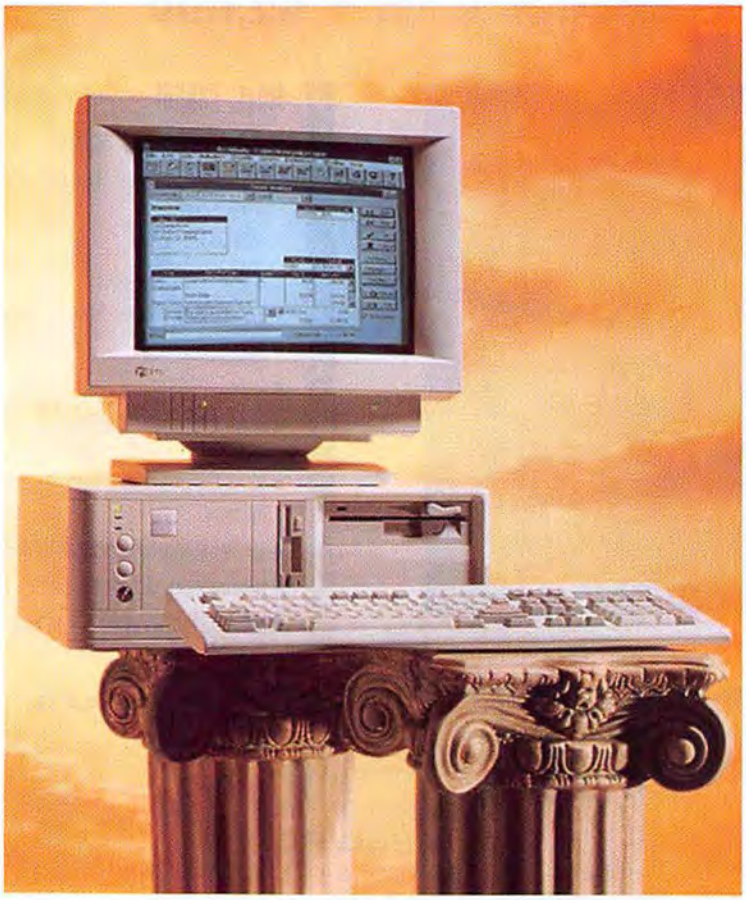
1-800-239-5728

[1] Please call for details regarding AMBRA's money-back guarantee and limited warranty, and IBM onsite warranty. Return shipping and insurance charges are the responsibility of the customer. Onsite service may not be available in certain locations.
[2] Offerings may differ in Canada.

© 1993 AMBRA Computer Corporation. AMBRA is a trademark of ICPI Ltd. and used under license therefrom. The AMBRA logo and logotype are trademarks of AMBRA Computer Corporation. IBM is a registered trademark and Blue Lightning is a trademark of International Business Machines Corporation. MS-DOS is a registered trademark and Windows is a trademark of Microsoft Corporation. Intel is a registered trademark and Pentium is a trademark of Intel Corporation. All other product names are trademarks or registered trademarks of their respective suppliers. Offerings, prices and products are subject to change without prior notice. Prices do not include shipping.

Circle 162 on reader service card

PC WORLD



Cover Story

130 PCs for the Power Hungry: Pentiums vs. 486DX2-66s
It's no surprise that the first 60-MHz Pentium PCs from Acer, ALR, Compaq, and IBM turn in astounding performance. But compared to top-of-the-line 486DX2-66s, is the performance worth the price?

134 AcerPower Series 9000
135 Acma 486/66/DX2
136 ALR Evolution V
150 ALR Flyer VL 4/50d
136 Ares 486-66DX2 EISA/VESA
136 AST Premmia 4/66d
140 Blackship BLK 486/66LB
150 CAF Master L737 DX2/66
150 Compaq Deskpro 5/60M
140 Comtrade Professional 66
141 Dell Dimension 466V/XPS
141 Diamond DT 486DX2-66
142 Gateway 2000 4DX2-66V
142 IBM PC Co. ValuePoint P60/D
143 Insight 486DX2-66
143 National MicroComputers Universal Pro-System 466
143 NCR System 3333
146 NEC Image 466es
146 Netis N4D266VL
148 Polywell Poly4586-66VC
148 Tagram Concerto 486DX2-66
150 Tri-Star 486DX2/66
150 Unisys PW2 Advantage Plus
150 USA Flex VL486DX2-66
148 Zeos 486DX2-66

Cover photography by Stan Musilek

Systems

161 Are You Ready for Mass Market PCs?
Now you can shop for your PC at the same giant discount stores and warehouses where you buy your television, microwave, even paper towels and Cheetos. It's convenient and cheap, but it's not without problems.

p. 204

Operating Systems

170 DOS vs. DOS vs. DOS
All competitively priced and claiming compatibility, three new DOS upgrades are vying for your attention: Microsoft's MS-DOS 6.2, IBM's PC-DOS 6.1, and Novell's DOS 7. We assess their safety and their strengths.

Top of the News

70 7 Pentiums for Less Than $3500
Test driving the '94 models: high-power Pentiums starting at $2995, fully equipped.

74 A Bit of Windows in 1-2-3 for DOS
The premier DOS spreadsheet adds a better interface, cell annotation, and more.

76 Under $1000 for 600-dpi PostScript
Sharp's JX-9460PS printer makes new levels of professional printing affordable.

80 OmniBook Gets Power
HP's subnote moves up to the 486SLC.

81 OS/2 Multimedia Presentations
Tools for building dazzling presentations that blow away any Windows software.

84 Mwave: Digital Office Assistants
All-in-one fax, data, voice, and video.

Hard Disks

185 Is Compression Worth It?
Disk compression is an inexpensive, quick way to nearly double the size of hard disks. Is it worth the risks? Our answer: a qualified yes.

Printers

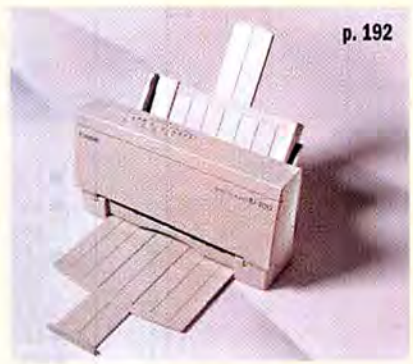
192 Ink Jet Printers: Laser Quality for $300
Ink jets offer the right compromise between laser quality and dot matrix price. We test eight models to find the best balance of speed, quality, and price.

Windows/DOS

204 Sound Investments: Personal Finance Software
All reasonably priced under $80, these seven personal finance packages help track expenses, manage investments, and plan for financial goals. Which should you trust with your money?

Service and Support

156 Win a 486DX2-66 PC
How satisfied are you with your PC? Have you had problems? Or is your PC trouble-free? Tell us about it. Fill out and fax in this month's survey for a chance to win a Gateway 2000 4DX2-66V, a Best Buy PC featured in this month's system review.



New Products

89 AST Advantage Adventure multimedia PCs
90 Panasonic CF-V21P notebook PC
90 Compaq Concerto notebook PC
92 Hewlett-Packard DeskJet 310, Canon BJC-600 color ink jet printers
92 Panasonic KX-P4400 and KX-P5400 laser printers
98 Lotus SmartSuite 2.1, Microsoft Office 4
102 CypherScan 1000, Cognitive BCR, Scan-in-Dex business card scanners
104 Aldus PhotoStyler 2.0 image editing software
104 Symantec Q&A 4.0 for Windows
109 Microsoft Windows Sound System 2.0
109 Caere OmniPage Professional 5.0 OCR software
110 WinSleuth Gold Plus diagnostic software
110 WinSense 2.0 optimizing utility
112 Xircom's Ethernet,Hayes Optima 144 + Fax144 for PCMCIA modems
116 CompuServe Navigator for Windows
116 Powercore Network Scheduler 3 version 2
120 Quick Takes

PC World™ (ISSN 0737-8939) is published monthly at $29.90 for one year (12 issues), $59.80 for two years (24 issues), $89.70 for three years (36 issues) by PC World Communications, Inc., 501 Second St. #600, San Francisco, CA 94107. Foreign orders must be prepaid in U.S. funds with additional postage. Add $18 per year for Canada and Mexico; add $46 per year for airmail for all other countries. Canadian GST Registration #R124669680. Second-class postage paid at San Francisco and additional mailing offices. POSTMASTER: Send address changes to *PC World*, Subscription Dept., P.O. Box 55029, Boulder, CO 80322-5029. Editorial and business offices: 501 Second St. #600, San Francisco, CA 94107, 415/243-0500. Copyright © 1994, PC World Communications, Inc. All rights reserved. The following are trademarks of PC World Communications, Inc.: *Consumer Watch, Star-Dot Star, PC World.*

Here's How

224 Help Line
228 Spreadsheets
234 Word Processing
240 Windows
244 OS/2
248 Data Management
250 Publishing & Presentations
254 Communications
256 Hardware
258 Star-Dot-Star
261 Instant Reference Card
File and disk compression

Departments

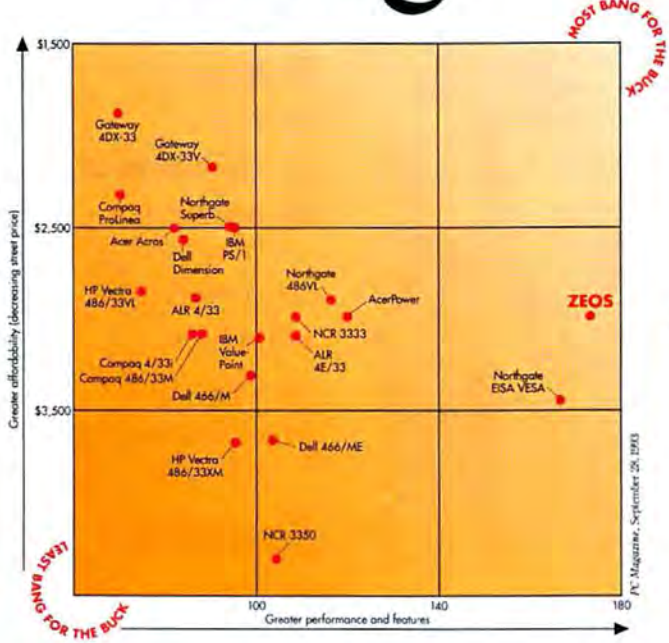
15 In This Issue
19 Letters
27 Consumer Watch
39 Real Problems, Real Solutions
43 Inside Source
301 Break Time
304 Home Office

Resources

12 How to Contact PC World
34 1993 PC World Index: Order now.
243 Coming Up
266 PC World Catalog
274 Mail-Order Shopping Guide
297 Advertiser Index
299 Editorial Product Index

PC MAGAZINE REVEALS:

The Computer That Gives You The Most Bang For The Buck.



ZEOS® 486DX2-66... THE TOP GUN $2995

- **Intel Verified:** for the Pentium™ OverDrive™ Processor
- 8MB RAM, expandable to 64MB
- 256K SRAM system cache
- 528MB local bus IDE hard drive
- Diamond Viper local bus video card with 1MB VRAM
- 1.2MB and 1.44MB floppy drives
- 15" ZEOS color SVGA 1024 x 768 non-interlaced monitor, flat screen, .28mm dot pitch
- MS-DOS 6.2 with Enhanced Tools, Windows for Workgroups 3.11, and new Microsoft Mouse, plus choice of Lotus Windows applications
- 14,400 bps V.32 bis send/receive fax modem
- SAME DAY SHIPPING

Others pale in comparison. There's no way to dispute it! The results are in, and the ZEOS Upgradable 486DX2-66 is "the overall performance winner."

PC buyers expect low prices, top-quality, impeccable performance and prompt support. Basically, they want the most bang for their buck. *PC Magazine* recognized this and compared value-line PCs with more traditional systems to see if they were "truly good values or stripped-down machines trying to pass for good buys." The results are overwhelmingly in ZEOS' favor. In fact, *PC Magazine* said: *"ZEOS doesn't sell a separate value line, but the flexibility of its main system may be the least confusing solution of all."*

intel inside

Stacked against Gateway, Dell, Compaq, IBM and others, ZEOS stood alone. Using the benchmark tests as a guide, *PC Magazine* made these conclusions:

"As DOSmark scores are heavily weighted for processor and hard disk performance, the ZEOS garnered the first-place position in that category as well."

"The clear winner is...the ZEOS Upgradable, which turned in an incredible score of 55.01 megapixels per second."

"The real highlight among tested hard disks was the Seagate ST3600A, which has 12-ms access time and 256K of built-in cache. The ZEOS 486DX2-66 Upgradable's hard disk performance was almost 31 percent above the average in this roundup."

Of the *"systems that demonstrated the best agility under strenuous exercise of all their components... ZEOS (scored) 26 percent above average."*

The ZEOS local bus upgradable systems are the perfect solution—the high-tech motherboard is faster, more integrated, versatile and reliable than ever. Plus, ZEOS is always thinking ahead to your

STANDARD WITH EVERY ZEOS UPGRADABLE SYSTEM	PACKAGE 1	PACKAGE 2	PACKAGE 3	PACKAGE 4
■ **Intel Verified:** for the Pentium™ OverDrive™ Processor. Zero Insertion Force (ZIF) socket makes upgrading easy. ■ RAM expandable to 64MB on the motherboard. ■ Two serial ports and one parallel port integrated on the motherboard. ■ Flash BIOS for easy upgradability. ■ Eight expansion slots: two VESA local bus, five 16-bit and one 8-bit. ■ ZEOS six-bay desktop case with two cooling fans for increased reliability and product life. ■ 200 watt power supply with built-in surge suppression; switchable between 115/230V. ■ Socket for inexpensive optional on-board SCSI. ■ Shadow RAM support. ■ ZEOS 101-key space-saving keyboard. ■ FCC Certified Class B; UL Listed. ■ Complete ZEOS Customer Satisfaction Package.	**486SX-25 $1395** Lease $59/month **486SX-33 $1495** Lease $63/month **486DX-33 $1595** Lease $58/month **486DX2-50 $1695** Lease $61/month **486DX2-66 $1895** Lease $69/month ■ **Intel Verified:** for the Pentium™ OverDrive™ Processor ■ 2MB high-speed RAM ■ 107MB local bus IDE hard drive with 32K cache ■ Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM. 16.7 million colors ■ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dot pitch ■ Your choice of floppy drives ■ Microsoft DOS 6.2 plus Enhanced Tools	**486SX-25 $1695** Lease $61/month **486SX-33 $1795** Lease $65/month **486DX-33 $1895** Lease $69/month **486DX2-50 $1995** Lease $72/month **486DX2-66 $2195** Lease $79/month ■ **Intel Verified:** for the Pentium™ OverDrive™ Processor ■ 4MB high-speed RAM ■ 214MB local bus IDE hard drive with 128K cache ■ Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM. 16.7 million colors ■ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dot pitch ■ Both 1.2MB and 1.44MB floppy drives ■ MS-DOS 6.2 with Tools, Windows for Workgroups 3.11 & ergonomic Microsoft Mouse, plus choice of Lotus Windows application	**486SX-25 $1995** Lease $72/month **486SX-33 $2095** Lease $76/month **486DX-33 $2195** Lease $79/month **486DX2-50 $2295** Lease $83/month **486DX2-66 $2495** Lease $90/month ■ **Intel Verified:** for the Pentium™ OverDrive™ Processor ■ 8MB high-speed RAM ■ 426MB, 13ms local bus IDE hard drive with 128K cache ■ Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM. 16.7 million colors ■ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dot pitch ■ Both 1.2MB and 1.44MB floppy drives ■ MS-DOS 6.2 with Tools, Windows for Workgroups 3.11 & ergonomic Microsoft Mouse, plus choice of Lotus Windows application	**486SX-25 $2495** Lease $90/month **486SX-33 $2595** Lease $94/month **486DX-33 $2695** Lease $98/month **486DX2-50 $2795** Lease $101/month **486DX2-66 $2995** Lease $108/month ■ **Intel Verified:** for the Pentium™ OverDrive™ Processor ■ 16MB high-speed RAM ■ 528MB, 12ms local bus IDE hard drive with 256K cache ■ Diamond SpeedStar Pro Windows-accelerated local bus video with 1MB RAM. 16.7 million colors ■ ZEOS 14" 1024 x 768 NI SVGA color monitor, .28mm dot pitch ■ Both 1.2MB and 1.44MB floppy drives ■ MS-DOS 6.2 with Tools, Windows for Workgroups 3.11 & ergonomic Microsoft Mouse, plus choice of Lotus Windows application

FAVORITE OPTIONS

426MB to 528MB HDD UPGRADE **$125**

256K SYSTEM CACHE.....**$98**

ADAPTEC 6360 SCSI CONTROLLER CHIP
For on-board SCSI. Includes drivers **$49**

96/48/24 V.42 bis SEND/RECEIVE FAX MODEM **$79**

DIAMOND VIPER VIDEO CARD
1MB VRAM: **$149** 2MB VRAM: **$249**

15-INCH MONITOR UPGRADE
SVGA non-interlaced, 1024 x 768, flat screen **$95**

COMPLETE MULTIMEDIA PACKAGE
Double speed, multisession MPC2 compliant CD-ROM, 16-bit/48KHz Cardinal Digital Sound Pro 16 with Digital Signal Processor (Soundblaster and Adlib compatible). Labtec stereo speakers.....**$395**

Many other affordable upgrades and options available. Call for details!

future needs and technological advances; therefore, we include such features as verified CPU upgradability to Intel's Pentium OverDrive; a Zero Insertion Force (ZIF) CPU socket, Flash BIOS for easy upgradability, and a SCSI upgrade socket for adding SCSI without having to use a slot. We've even given you room to grow with eight expansion slots and six drive bays.

Choose from one of our money-saving packages, or we'll custom build a system to your specifications. Feature for feature, no one gives you more than ZEOS. At any price, anywhere. *It is the biggest bang for your buck!*

Fax Orders: 612-633-1325, Government: 800-245-2449, TDD Orders: 800-228-5389, Outside U.S. and Canada: 612-633-6131. MasterCard, VISA, Am Ex, Discover, Z-Card,SM COD and Leasing programs. Open 24 Hours a Day, 365 Days a Year!

AWARD-WINNING SERVICE

We're the only company to win *PC Magazine*'s Readers' Choice for Service & Reliability —for both desktops and notebooks—*twice!*

TOLL-FREE SUPPORT, WARRANTIES & GUARANTEES.

We're here for you 24 hours a day, 365 days a year, and always a toll-free call away. All ZEOS systems come with a One Year Limited Warranty, Express Parts Replacement Policy and a 30-Day Money-Back Guarantee.

CALL NOW TOLL FREE

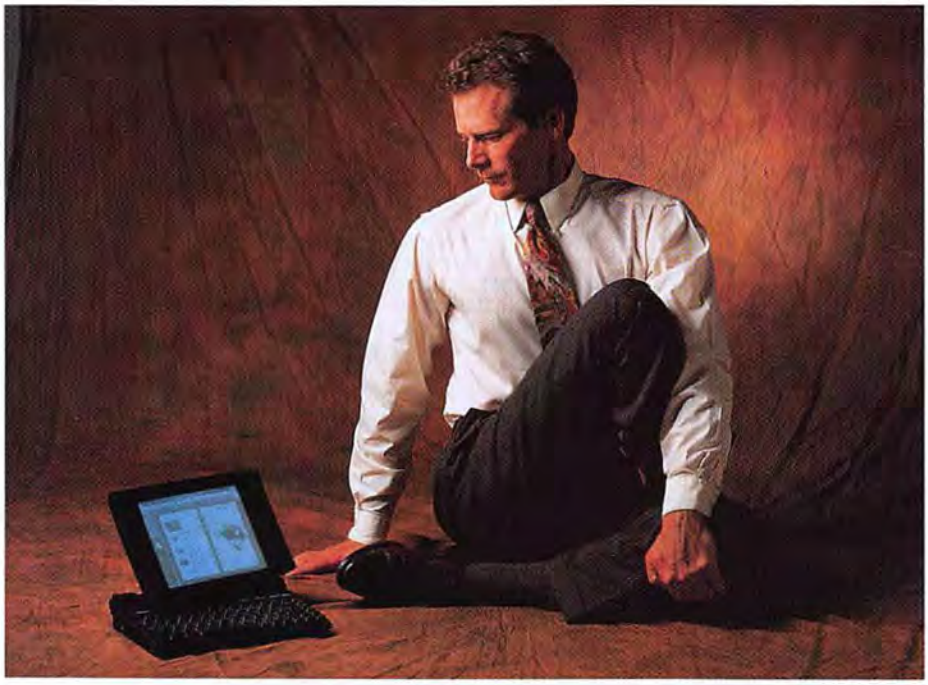
800-554-5220

24 HOURS A DAY

ZEOS® INTERNATIONAL, LTD.

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease; 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. Intel, Pentium, and OverDrive are trademarks of Intel Corporation in the USA and other countries. ZEOS is a registered trademark; Z-Card and Computers Now! are registered servicemarks of ZEOS International Ltd. ©1993 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS).
UPGR-PCW-9401

The Flexible System For Your Every Position.



THE ZEOS® FREESTYLE™...THE POWER TO MOVE.

The feeling of freedom is unrestricting and comfortable. It's also power and strength. The ZEOS Freestyle gives you freedom of movement, power, and so much more.

The only notebook on the market with the revolutionary tilt and swivel screen, the Freestyle allows you to adjust the screen to the perfect viewing angle–no matter what your position. Use it in your lap, on a plane or for presentations.

For maximum power, we've given you the option of a 386SL or 486SL Intel processor and memory options from 2MB to 20MB. We've also included such features as a built-in mouse key, internal floppy drive, soft carrying handle and many power management features. In addition, we offer an array of accessories. At only 5.6 pounds, including the battery, you'll want to take it everywhere.

Unique tilt and swivel display moves for your every position.

Full desktop power with movement. It's a flexible choice. Why not call us now to enhance your position?

AWARD-WINNING SERVICE

We're the only company to win *PC Magazine*'s Readers' Choice for Service & Reliability–for both desktops and notebooks *–twice!*

We're here for you 24 hours a day, 365 days a year, and always a toll-free call away. All ZEOS systems come with a One Year Limited Warranty and 30-Day Money-Back Guarantee.

CALL NOW TOLL FREE 800-554-5220

Fax Orders: 612-633-1325, Government: 800-245-2449, Hearing Impaired (TDD): 800-228-5389, Outside U.S. and Canada: 612-533-6131. Purchase Orders, MasterCard, VISA, Discover, Am Ex, Z-Card,™ COD and affordable leasing programs. Open 24 Hours a Day, 365 Days a Year!

ZEOS® INTERNATIONAL, LTD.

STANDARD WITH EVERY ZEOS FREESTYLE

- 25MHz 80386SL or 80486SL Intel microprocessor.
- 386SL: 64K SRAM system cache 486SL: 8K internal system cache.
- RAM expandable to 20MB (486SL) or 10MB (386SL).
- IDE hard drive expandable to 260MB.
- 256K (386SL version) or 512K (486SL version) video RAM.
- Internal 3.5" 1.44MB floppy drive.
- Serial, parallel, video and PS/2 (keyboard, mouse or 10-key pad) ports.
- Supports an external SVGA color monitor with simultaneous display capability.
- 486SL version includes 3.3V technology for added battery life, and built-in math coprocessor.
- Replaceable and rechargeable NiCad battery.
- 640 x 480 VGA backlit LCD display, 9.5" diagonal, supporting up to 64 shades of gray.
- Unique tilt and swivel display.
- 81-key keyboard with built-in mouse key, "inverted T" cursor keys and dedicated Home, PgUp, PgDn, and End keys.
- AC adapter with range from AC 110-240V to DC.
- Power-saving features.
- FCC Certified Class B.
- Complete ZEOS Customer Satisfaction Package.

PACKAGE 1

386SL Freestyle: $1295
Lease $55/month
486SL Freestyle: $1695
Lease $61/month
- 2MB RAM (386SL); 4MB RAM (486SL)
- 60MB IDE hard drive (386SL); 120MB IDE hard drive (486SL)
- Microsoft DOS 6.2

PACKAGE 2

386SL Freestyle: $1795
Lease $65/month
486SL Freestyle: $1995
Lease $72/month
- 6MB RAM (386SL); 4MB RAM (486SL)
- 120MB IDE hard drive (386SL); 180MB IDE hard drive (486SL)
- Custom nylon carrying case
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11

PACKAGE 3

386SL Freestyle: $2295
Lease $83/month
486SL Freestyle: $2495
Lease $90/month
- 10MB RAM (386SL); 8MB RAM (486SL)
- 180MB IDE hard drive (386SL); 260MB IDE hard drive (486SL)
- Internal 2400 bps V.42 bis modem with 9600 bps send/receive fax
- Custom leather carrying case
- Extra battery
- External charging stand
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease; 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. ZEOS is a registered trademark; Z-Card and Computers Now! are registered servicemarks; Freestyle is a trademark of ZEOS International Ltd. ©1993 ZEOS International Ltd. 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS). FS-PCW 9401

Circle 237 on reader service card

The Traveler's Dream At An Ideal Fare...$995.

THE ZEOS® CONTENDA® ...DON'T GET CAUGHT WITHOUT IT!

What a dream! The ZEOS Contenda subnotebook is small enough to tuck away in your briefcase and so light you'll forget you have it! It's the perfect traveling companion.

Smaller than a notebook. Lighter than a hard-cover novel.

All your business and home needs contained in a bundle just shy of four pounds. Write letters and memos. Create presentations. Keep in touch with associates through the internal send/receive fax modem. Organize your files, calendar, planner and more...keep track of all appointments!

What's more, with a standard 80MB hard drive, memory up to 10MB and your choice of a 386SL-25 or 486SL-25 Intel processor, the Contenda has plenty of power to run Windows. You'll also find you can work longer because the processor is intelligent enough to power-down the memory, disks, modem and more when they're not in use. In addition, the compact package includes a built-in trackball and high-resolution backlit screen.

It's a traveler's dream come true: The world at your fingertips in a mighty and tiny portable bundle. Don't get caught without it!

AWARD-WINNING SERVICE

We're the only company to win *PC Magazine*'s Readers' Choice for Service & Reliability–for both desktops and notebooks–*twice!*

We're here for you 24 hours a day, 365 days a year, and always a toll-free call away. All ZEOS systems come with a One Year Limited Warranty and 30-Day Money-Back Guarantee.

CALL NOW TOLL FREE 800-554-5220

Fax Orders: 612-633-1325, Government: 800-245-2449, Hearing Impaired (TDD): 800-228-5389, Outside U.S. and Canada: 612-633-6131. Purchase Orders, MasterCard, VISA, Discover, Am Ex, Z-Card,™ COD and affordable leasing programs. Open 24 Hours a Day, 365 Days a Year!

ZEOS INTERNATIONAL, LTD.

STANDARD WITH EVERY ZEOS CONTENDA

- 25MHz 80386SL or 80486SL Intel CPU.
- RAM expandable to 8MB for 486SL, 10MB for 386SL.
- (486SL) IDE hard drive upgrade to 120MB.
- Display: 640 x 480 VGA backlit, .23 dot pitch, Sharp 7.4" diagonal, up to 64 shades of gray.
- 256K (386SL) or 512K (486SL) video RAM.
- 486SL version includes 3.3V technology for added battery life, PI local bus for Windows acceleration, high-speed floppy drive controller, built-in math coprocessor.
- Supports simultaneous display with an external SVGA color monitor.
- Replaceable and rechargeable NiMH battery.
- 80-key keyboard with embedded numeric keypad and easy-to-use built-in trackball.
- Serial, parallel and video ports, plus ports for optional internal fax modem and external floppy drive.
- Fully-featured power management.
- 9.7" x 6.1"; 3.9 lbs.
- FCC Certified Class B.
- Complete ZEOS Customer Satisfaction Package.

PACKAGE 1

386SL Contenda: $995
Lease $42/month

486SL Contenda: $1495
Lease $63/month

- 2MB RAM (386SL); 4MB RAM (486SL)
- 80MB IDE hard drive

PACKAGE 2

386SL Contenda: $1295
Lease $55/month

486SL Contenda: $1795
Lease $65/month

- 4MB RAM
- 80MB IDE hard drive
- External 3.5" floppy disk drive
- Microsoft DOS 6.2 and Windows for Workgroups 3.11. Plus Lotus Organizer.

PACKAGE 3

386SL Contenda: $1595
Lease $67/month

486SL Contenda: $2195
Lease $79/month

- 4MB RAM (386SL); 8MB RAM (486SL)
- 80MB IDE hard drive
- External 3.5" floppy disk drive
- Custom leather carrying case
- Extra battery
- Internal 96/48/24 send/receive fax modem
- Microsoft DOS 6.2 and Windows for Workgroups 3.11. Plus Lotus Organizer.

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease; 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. ZEOS and Contenda are registered trademarks; Z-Card and Computers Now! are registered servicemarks of ZEOS International Ltd. ©1993 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS).
CN-PCW-9401

Circle 142 on reader service card

PC WORLD

EDITOR IN CHIEF Philip Lemmons

EDITOR Cathryn Baskin
EXECUTIVE EDITOR Russell Glitman
MANAGING EDITOR Luis Camus
ART DIRECTOR Robert Kanes

SENIOR EDITORS
Features Steve Fox
User Issues Roberta Furger
Reviews Owen Linderholm
News Joe Abernathy (713/666-5896)

EAST COAST EDITOR Randy Ross (617/422-8020)

EDITORIAL
Assistant Managing Editor Anne Kandra
Technical Editor Karl Koessel
Associate Editors Jeff Bertolucci, Rex Farrance, Bryan Hastings, Lincoln Spector
Assistant Editors Michael Desmond, John Goddard, Anita Hamilton, Dan Miller, Christina Wood
Assistant Technical Editor Shane Rau
Asst. Editor, East Coast Laurianne McLaughlin
Editorial Assistant Caroline Jones
Editorial Intern Sarah Klein
Fact Checker Arden M. Hoffman

Copy Chief Richard Johnson
Senior Copy Editors Barbara Lewis, Marla Miyashiro, Peggy Nauts
Copy Editors Nina Barringer, Kimberly Stein
Electronic Typographer Henry Pham

Asst. to the Editor in Chief Cynthia Grossman
Administrative Assistants Ken Blaylock, Heidi Zinsmeister Wolff

Business Manager Scott Danish
Librarian Stella Chan

ART & DESIGN
Associate Art Director Greg Silva
Senior Designers Barbara Adamson, Laura Guerin
Senior Design Associates Tim J Luddy, Carolyn Perot
Designer/Infographics Jeff Berlin
Assistant Designer/Infographics Hope Winslow
Production Artist Marlene Tobias

CONTRIBUTING EDITORS
Anita Amirrezvani, Steve Bass, TJ Byers, George Campbell, David Coursey, Scott Dunn, Bronwyn Fryer, Brett Glass, Michael Goodwin, Judy Heim, Richard Jantz, Eric Knorr, Robert Luhn, Celeste Robinson, Richard Scoville, Gene Smarte, Scott Spanbauer, Daniel Tynan

Founder David Bunnell
Founding Editor Andrew Fluegelman

PC WORLD ONLINE
Director Jim Moody (America Online, PCW JimM; CompuServe, 71154,212)
Manager Dennis Sheridan (America Online, PCW Dennis; CompuServe, 71154,362)
Administrative Assistant Licia Slimon

PC WORLD TEST CENTER
Director Gregory Smith
Senior Performance Analysts Dean Andrews, Thomas Grubb
Performance Analysts Ulrike Diehlmann, Susan Silvius

USER GROUP ADVISORY BOARD
Steve Bass, Pasadena IBM Users Group; Roger Bender, Microcomputer Managers Association; Jack Bolton, Atlanta PC User's Group (APCUG); Brian Camenker, Boston Computer Society; Rollie Cole, APCUG; Paul Curtis, APCUG; Mary Dolce, Chicago Computer Society; Sandy Frunzi, Las Vegas PC User Group; Al Harrison, Houston Area League PC Users; David Hoffman, NYPC; Joseph Rigo, NYPC; Irving Samuels, Capital PC User Group

PRESIDENT Patrick Kenealy

PUBLISHER Richard J. Marino

SENIOR VICE PRESIDENT, CIRCULATION, MARKETING, RESEARCH Heather Martin Maier

VICE PRESIDENT, DIRECTOR OF ADVERTISING Jeff Edman

VICE PRESIDENT, MANUFACTURING Linda Manes Goodwin

DIRECTOR, HUMAN RESOURCES Richard Willoughby

DIRECTOR OF FINANCE Vicki Peilen

PC WORLD LOTUS EDITION

Executive Editor Eric Bender
Senior Associate Editors Richard Cranford, Ann Kremers, Carrie Thomas
Associate Editors Andrea C. Powers, Carol White
Assistant Editor Catherine Kenny

LOTUS EDITION MAILING ADDRESS
77 Franklin St. #300, Boston, MA 02110
Phone: 617/482-8470 **Fax:** 617/426-0235

LOTUS NEWSLETTER DIVISION
Publisher Craig Pierce
Editor in Chief Jennifer J. Smith
Production Manager Andrew Ochrymowych

Music To Your Eyes.

The ZEOS® ColorNote™... scaling new heights.

With color and power you can't beat, the ZEOS ColorNote 486 is the only color notebook worth taking note!

We started with a reliable 486SX Intel processor running at 33MHz. Then we loaded it with enough memory and power to run Windows: 4MB or 8MB RAM (expandable to 20MB), an 80MB, 120MB or 170MB IDE hard drive and an 8K built-in cache. And, we added local bus video for super-fast video performance.

Blazing colors seem to sing. Images are vibrant and alive. For a crisp VGA backlit screen displaying up to 256 colors, the ColorNote employs dual scan technology– a breakthrough that achieves color comparable to that of a desktop color monitor yet not as expensive as active matrix.

What's more, it comes equipped with a PCMCIA slot, an internal floppy drive, built-in trackball and a Nickel-Metal Hydride battery. If your needs go beyond the standard scale, you can compose a personalized package with our many options. Let the ColorNote be the basis for your creative scores and presentations.

ZEOS dual scan screen (left) fires up rich, vibrant colors while standard passive matrix screen (right) produces faded and dull colors. Photos are not retouched.

AWARD-WINNING SERVICE

We're the only company to win *PC Magazine*'s Readers' Choice for Service & Reliability–for both desktops and notebooks–*twice!*

We're here for you 24 hours a day, 365 days a year, and always a toll-free call away. All ZEOS systems come with a One Year Limited Warranty and 30-Day Money-Back Guarantee.

CALL NOW TOLL FREE

800-554-5220

Fax Orders: 612-633-1325, Government: 800-245-2449, Hearing Impaired (TDD): 800-228-5389, Outside U.S. and Canada: 612-633-6131. Purchase Orders, MasterCard, VISA, Discover, Am Ex, Z-Card,™ COD and affordable leasing programs. Open 24 Hours a Day, 365 Days a Year!

ZEOS INTERNATIONAL, LTD.

STANDARD WITH EVERY ZEOS COLORNOTE 486

- 33MHz 486SX Intel processor.
- RAM expandable to 20MB.
- IDE hard drive expandable to 170MB.
- 8K internal cache.
- Internal 3.5" 1.44MB floppy disk drive.
- PCMCIA slot supporting a type I, II or III device.
- 512K video RAM.
- Local bus video for super-fast video performance.
- Display: 640 x 480 dual scan color VGA backlit LCD, 9.4" diagonal, up to 256 colors.
- Supports an external SVGA color monitor at resolutions up to 1024 x 768.
- 82-key keyboard with embedded numeric keypad and 12 dedicated function keys.
- Built-in trackball.
- Replaceable and rechargeable NiMH battery.
- One serial port, parallel port, keyboard port, mouse port and external video port.
- Full power management features include Low Power mode and programmable Stand-by features.
- AC adapter from AC110-240V to DC.
- 8.54" x 11.65" x 1.5"; 5.6 lbs.
- FCC Certified Class B; UL Listed.
- Complete ZEOS Customer Satisfaction Package.

PACKAGE 1

ColorNote 486: $2395
Lease $87/month
- 4MB RAM
- 80MB IDE hard drive

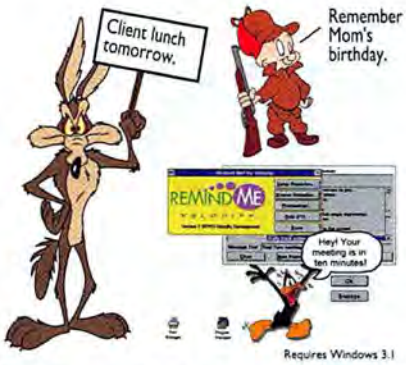
PACKAGE 2

ColorNote 486: $2695
Lease $97/month
- 4MB RAM
- 120MB IDE hard drive
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11
- Lotus Organizer

PACKAGE 3

ColorNote 486: $2995
Lease $108/month
- 8MB RAM
- 170MB IDE hard drive
- Custom leather carrying case
- Microsoft DOS 6.2
- Microsoft Windows for Workgroups 3.11
- Lotus Organizer

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease; 10% purchase option. All prices, specifications and availability are subject to change without notice; call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. ZEOS is a registered trademark; Z-Card and Computers Now! are registered servicemarks; ColorNote is a trademark of ZEOS International Ltd. ©1993 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS).
CLR/PCW-9401



Requires Windows 3.1

WHAT'S UP DOC?™

Introducing Remind Me!™ for Windows

The easy and fun way to remember important events.

Animated Looney Tunes characters bring your multi-media computer to life. Plus actual cartoon sound tracks. You choose from over 20 images of Bugs and all his pals that burst onto the screen at the appointed day and time. REMIND ME! also does a lot more.

So, see your software dealer, or call us toll-free at 1-800-VLOCITY.

VELOCITY

© 1993 Velocity™. All rights reserved. Velocity and Remind Me! are trademarks of Velocity Development Corporation. Looney Tunes, characters, names and all related indicia are trademarks of Warner Bros. © 1993.

Circle 192 on reader service card

HOW TO CONTACT PC WORLD

MAIL

PC World Editorial, 501 Second St. #600, San Francisco, CA 94107
Phone: 415/243-0500 **Fax:** 415/442-1891
America Online: keyword PC WORLD
CompuServe: GO PWOForum
MCI Mail: PC World Editorial or 179-3813
Internet: 1793813@mcimail.com

SUBSCRIPTION SERVICES, ADDRESS CHANGES

For *PC World* and the *PC World Lotus Edition*: Call toll-free 800/234-3498 (303/447-9330 in Colorado and Canada), or write Subscriber Services, P.O. Box 55029, Boulder, CO 80322-5029. To place new orders, call 800/825-7595.

PC WORLD ONLINE

You can contact the editors by sending electronic mail to the PC World Online areas of America Online and CompuServe. The areas feature current and back issues of *PC World* and the *PC World Lotus Edition*, a software library, and message boards.

To obtain a free America Online starter kit, call 800/827-6364.

To join PC World Online on CompuServe, set your communications software to 7 data bits, even parity, and 1 stop bit. To find out your local access number, dial 800/346-3247 (modem) and type **Phones** at the Host Name ID prompt. Fill in the requested information. Then dial again using the local access number, and once connected, press **<Enter>**. Fill out the screen as follows:

Host Name: **CIS** User ID: **177000,5605**
Password: **COMPUSERVE** Agreement#: **PCWORLD**
Serial Number: **<Enter>**

If you require further assistance, or if you would like to receive the *PC World* customized interface, call CompuServe customer assistance at 800/848-8990, 800/635-6225 in Canada. You may order membership kits for sign-up after business hours by calling 800/848-8199.

LETTERS TO THE EDITOR

Send editorial correspondence electronically to the Message Board on PC World Online or mail it to *Letters to the Editor* at *PC World*. Be sure to include your name, city, and state. We reserve the right to edit letters.

CONSUMER WATCH

Send consumer-related questions and complaints to *Consumer Watch* at *PC World;* to the Consumer Watch forum on PC World Online; or to MCI Mail, PC World Editorial.

REAL PROBLEMS, REAL SOLUTIONS

Send article ideas—including a brief outline of your company, job, problem, and solution as well as your name, address, and phone number—to *Real Problems, Real Solutions* at *PC World;* or send them electronically to the Real Problems, Real Solutions forum on PC World Online; CompuServe, 72614,1534; 415/326-4304 (fax); or call us at 415/978-3212. *PC World* pays $300 per published column.

INSIDE SOURCE

Mail editorial correspondence to *Inside Source* at *PC World* or send it electronically to the following addresses: CompuServe, 76711,23; MCI Mail, PCLETTER; America Online DCOURSEY.

HERE'S HOW

Send questions electronically to the appropriate forum on PC World Online (for example, send *Help Line* questions to the Help Line forum) or to the online address below, or mail them to columnists at *PC World*.

Contact editors at the following addresses:
Help Line: CompuServe, 74055,412; MCI Mail, 179-3813; Internet, 1793813@mcimail.com
Spreadsheets: CompuServe, 72341,2727; MCI Mail, 357-4517
Word Processing: CompuServe, 71571,222; MCI Mail, GCAMPBELL
Windows: CompuServe, 74055,412
Data Management: CompuServe, 74055,412
Publishing & Presentations: MCI Mail, RJANTZ; mail make-over candidates, preferably clean and unfolded, to *Publishing & Presentations, Make-Overs* at *PC World*
Communications: CompuServe, 75300,713; MCI Mail, 312-7737; GEnie, JUDY.HEIM; Internet, 3127737@mcimail.com
Hardware: MCI Mail, 459-7102
Star-Dot-Star: CompuServe, 74055,412; Internet, rogue@well.sf.ca.us

HOME OFFICE

Mail editorial correspondence to *Home Office* at *PC World* or send it electronically to the Home Office forum on PC World Online or to CompuServe, 71333,130.

READER SUBMISSIONS

Send us your technical problems and solutions. *PC World* pays $25 for each *Power Tip* we publish, $200 to the user group featured in *User Group Tips*, $25 to $200 for *Star-Dot-Star* items, $50 for questions used in the Here's How section, and $200 for items made over in *Publishing & Presentations*. Keep submissions brief (*Power Tips* to 100 words or less); accepted submissions will be acknowledged by payment.

NEW PRODUCT ANNOUNCEMENTS

Address hardware and software press releases to *New Products* at *PC World* or call 415/978-3212.

REPRINTS AND PERMISSIONS

You must have permission before reproducing any material from *PC World* and the *PC World Lotus Edition*. To quote from or reprint any portion of any article, or to use artwork or photographs from the magazine, send a written request to *PC World*, Reprints and Permissions, 501 Second St. #600, San Francisco, CA 94107; include a phone number for a fast response. To order reprints of your company's editorial coverage in *PC World* or *PC World Lotus Edition*, call 415/978-3353.

THE ZEOS® PANTERA™– YOUR PENTIUM™ PROCESSOR SOLUTION.

Hey, all you speed demons. Looking for the fastest thing around? Search no longer. The ZEOS Pantera has arrived!

It's fast. It's powerful. It's the ultimate system. It's a multi-user must. Tough enough to run your toughest applications at record-breaking speed. The ZEOS Pantera system is intended for the strenuous and staggering demands of today's business computing world.

Our pure performance system begins with an innovative, high-tech motherboard only available in our Pantera systems.

Designed by ZEOS, the Pantera motherboard takes advantage of the Pentium processor's advanced features and includes the hottest new local bus technology, PCI. PCI

Pure Performance.

delivers 32-bit data transfer at a rate up to 132MB per second! We give you 3 PCI slots in addition to 5 ISA slots. Also on the motherboard: *integrated* business audio with digital sound record and playback, and optional *integrated* SCSI.

What else? More features standard like a sizzling PCI local bus video card, CD-ROM drive and 15" color monitor. And, we added monster hard drives in your choice of 528MB IDE, 1GB SCSI and 2GB SCSI.

The performance from ZEOS Pantera is a must for network servers or high-end systems. It's also the speedy ticket to improving your business. Quick, call 800-554-5220 and we'll hook you up to the fastest system around!

STANDARD WITH EVERY ZEOS® PANTERA™ SYSTEM

- Intel Pentium™ processor running at 60MHz.
- 256KB cache expandable to 512KB.
- RAM is expandable to 192MB on the motherboard.
- Windows-accelerated PCI local bus SVGA color graphics card.
- ZEOS 15" 1024 x 768 NI SVGA color monitor, .28mm dot pitch.
- One 1.44MB floppy disk drive and one 2X CD-ROM drive.
- Two high-speed serial ports and one enhanced parallel port on the motherboard.
- Ten-bay vertical case with two cooling fans.
- Three PCI slots and five ISA slots.
- 12-bit ADPCM business audio integrated on the motherboard.
- Socket for optional on-board Fast SCSI-2 support.
- Flash BIOS for easy upgradability.
- 200 watt power supply with built-in surge suppressor. Switchable between 115/230V.
- ZEOS 101-key space-saving keyboard.
- FCC Certified Class B; UL Listed.
- Complete ZEOS Customer Satisfaction Package.

PACKAGE 1	PACKAGE 2	PACKAGE 3
PANTERA-60.....$3495 Lease $115/month ■ 8MB RAM ■ 528MB IDE local bus hard drive ■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse ■ Choice of Lotus Windows Application	**PANTERA-60.....$4495** Lease $148/month ■ 16MB RAM ■ 1GB SCSI hard drive ■ On-board Fast SCSI-2 controller ■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse ■ Choice of Lotus Windows Application	**PANTERA-60.....$5995** Lease $198/month ■ 32MB RAM ■ 2GB SCSI hard drive ■ On-board Fast SCSI-2 controller ■ MS-DOS 6.2, Windows for Workgroups 3.11, Microsoft Mouse ■ Choice of Lotus Windows Application

CALL NOW TOLL FREE
800-554-5220
24 HOURS A DAY

Fax Orders: 612-633-1325, Government: 800-245-2449, Hearing Impaired (TDD): 800-228-5389, Outside U.S. and Canada: 612-633-6131. Purchase Orders, MasterCard, VISA, Discover, Am Ex, Z-Card,℠ COD and affordable leasing programs. Open 24 Hours a Day, 365 Days a Year!

ZEOS INTERNATIONAL, LTD.

Purchase orders are subject to approval. Business leasing programs available. Lease prices based on a 36-month lease, $1 purchase option. All prices, specifications and availability are subject to change without notice, call to confirm these and warranty details. Prices do not include shipping. All products and company names are trademarks or registered trademarks of their respective holders. Intel Inside and Pentium Processor Logos are trademarks of Intel Corporation. ZEOS is a registered trademark. Z-Card and Computers Now! are registered servicemarks. Pantera is a trademark of ZEOS International Ltd. © 1993 ZEOS International Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS).
PEN-PCW-9401

Now Even Bad Reports Can Look Good.

New CA-RET™ 1.0: The Friendliest, Most Powerful Report Writer Ever.

Add bitmapped images anywhere in your report for graphic impact.

Create exciting output from your CA-Clipper, dBASE and text files.

Dozens of built-in number-crunching functions are available for powerful data analysis.

Using different fonts adds pizzazz to your reports. CA-RET makes it a snap.

The allure of color: You get it in an easy, WYSIWYG environment.

You can even turn your data into eye-catching graphs.

Whatever the news, make it look great with new CA-RET/Xbase, the visual report writer for Windows.

With drag and drop, WYSIWYG design, it's as easy to use as a word processor, yet powerful enough to produce stunning results. Choose a wide variety of pre-formatted tabular layouts, labels and form letters — or create your own. Now you can add dazzling color, fonts and bitmaps to any report.

Place database fields, computed fields and aggregate computations anywhere and use the more than 40 built-in functions for extensive analysis.

And CA-RET's single-pass computation engine is the most efficient available.

From dBASE to Clipper, CA-RET/Xbase works with top databases (or text files) and acts as a DDE server so you can include reports in other Windows applications. And the unlimited use runtime license lets you distribute report applications for free.

MICROSOFT WINDOWS COMPATIBLE

To order, just call 1-800-531-5236 (in Canada: 1-800-665-5449). Competitive offer available for just $79 ($89 in Canada). Ask the operator for details.

Call today and find out how easy it is to turn the mundane into the magnificent.

COMPUTER ASSOCIATES®
Software superior by design.

© Computer Associates International, Inc., One Computer Associates Plaza, Islandia, NY 11788-7000.
All product names referenced herein are trademarks of their respective companies.

Circle 78 on Reader Service Card

The Pentium Has Landed?

MICHELE CLEMENT

When the first Pentium PCs were introduced six months ago, all but the most power-strapped users applauded their stellar performance and then shrugged them off as unaffordable. Sure, vendors claimed that Pentiums were nearly twice as fast as 486DX2-66s, but who wanted to pay $8000 or $10,000 for a PC? Not my boss, and probably not yours. True, the high prices reflected the scarcity of new Pentium chips. And most companies selling the first Pentiums positioned them not as desktop PCs but as servers, which made the prices a bit easier to swallow. Using a different tactic, Advanced Logic Research attempted to woo Pentium buyers with a comparatively low price. Its Evolution V started at $2495, but that bought you only a case and a motherboard; a few key components—hard disk, graphics board, monitor—were extra. In all, you didn't need to consult a Scrooge-like CFO to know that Pentiums didn't make much sense.

First Pentium Best Buy

That's on the verge of changing, as we report in two stories this month. First, in "PCs for the Power Hungry," a Pentium PC earns our Best Buy award for the first time. Equally notable, this Best Buy Pentium comes from IBM, a PC maker that *PC World* has chided in the past for excessively high prices. But no more. The company's ValuePoint P60/D, our reviewers found, delivers better value than the Pentiums we reviewed from ALR, Compaq, and Acer, and it beats out 15 fast 486DX2-66s as well.

Just how did IBM's Pentium manage to win this Best Buy? The 60-MHz ValuePoint P60/D clocked in about 25 percent faster than the NEC Image 466es, the fastest 486DX2-66 reviewed. The ValuePoint is priced at $4999, which includes 16MB of memory, a 424MB hard disk, and high-performance PCI local bus. The NEC Image 466es costs $3510, and that's with 8MB of memory, a 420MB hard disk, and VESA local bus. For about a 25 percent price premium—roughly $1000 more, adjusting for the additional RAM—the ValuePoint gives you about 25 percent more performance. That's starting to make sense.

Expect the Pentium advantage to grow, and expect IBM's price to drop as it works to hold on to its lead. Close on the P60/D's heels are new Pentiums priced at less than $3500 and even $3000. As Senior Editor Joe Abernathy reports in the lead story in *Top of the News*, a slew of lower-priced Pentiums will be available by the time you read this: Gateway's low-end Pentium starts at $2995; its high-end (with 16MB of RAM, a 528MB hard drive, PCI local bus, and a 17-inch monitor) starts at $3995. New Pentiums from Austin, Blackship, ALR, Compaq, NEC, and Dell will be priced competitively with Gateway's. And that's just the beginning.

There's one catch: You may have a hard time getting one. An adequate supply of these lower-priced Pentium PCs hinges on a plentiful supply of Pentium chips and the ability of vendors to engineer reliable, high-performance systems on schedule. The seven Pentium systems we tested for this month's news story barely straggled into the PC World Test Center in time. And our situation is not unique. For instance, when we called Gateway to check delivery of its low-end system, advertised since mid-October, we were told that customers faced waits of four to seven weeks.

Still skeptical about ordering a Pentium or actually getting one delivered if you do break down and decide to order one? All this jockeying at the high end should lead to lower prices for 486DX2-66s and Blue Lightning systems—mainstream PCs with plenty of power, in plentiful supply, and priced right for most offices today.

An Affordable Upgrade

At the other end of the price spectrum, what could be more affordable than a simple DOS upgrade? It may cost less, but it's not simple. In "DOS vs. DOS vs. DOS," we examine the price you'll pay—in more ways than one—for MS-DOS 6.2, PC-DOS 6.1, and Novell DOS 7. Working with a shipping version of PC-DOS and prerelease versions of MS-DOS and Novell DOS, writers Van Wolverton and Brett Glass examine the issues: data safety, compatibility with existing DOSes (read MS-DOS), enhanced features such as task switching and built-in networking, robustness of utilities, documentation, and support.

Expect IBM's price to drop. Close on the P60/D's heels are new Pentiums priced at less than $3500 and even $3000.

Their conclusion? It sounds like advice from your broker about investing: If you're averse to risk, choose safety over gain; and if you're a gambler, trade risk for potential reward. Wolverton and Glass agree on the choice for the chickenhearted, but from there they diverge. So first assess your level of comfort with risk-taking, then read their report for advice.

Cathryn Baskin

Cathryn Baskin, Editor

THE ME GENERA THE WE SPR

1-2-3 RELEASE 4 BRINGS IT ALL TOGETHER.

Once again, the world of spreadsheet users is coming together around Lotus® 1-2-3.®

The new 1-2-3 Release 4 for Windows™ has made using a spreadsheet easier, faster and dramatically more productive for everyone based on hundreds of advancements in functionality and usability.

In fact, a recent independent study reported that 67% of current Microsoft® Excel users surveyed would prefer to be using 1-2-3 Release 4.†

But it's the Working Together® features of 1-2-3 that are redefining the spreadsheet. These unparalleled workgroup capabilities are not only improving the way people work with spreadsheets, they're improving the way people work with each other.

> *Users who often collaborate on developing and refining worksheet data...will find Release 4 indispensable.*
> PC/WEEK, 5/3/93

CONNECT ON A BASIC LEVEL.

The first level of Working Together is networking. Every 1-2-3 package can be installed on the network right out of the box. No special version is required. And because 1-2-3 and all other Lotus

*In Canada, call **1-800-GO-LOTUS**. †Usability study by User Interface Engineering, 8/93. ©1993 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All Microsoft is a registered trademark and Windows is a trademark of Micro

TION DISCOVERS EADSHEET.

Windows applications are mail-enabled, you can quickly and easily share your data with others on the network. And vice versa.

COLLABORATE ON A HIGHER PLANE.

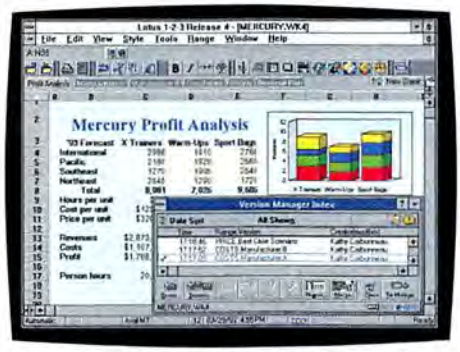
The real power of Working Together comes from 1-2-3's advanced Versioning technology and group editing powers. These are features no competitor can match.

With Version Manager™ technology, workgroup members know who made what contributions to a file, when and why. Each group member can save, label, track, mix, merge and comment on ranges, worksheets or entire files. And do it all without overwriting existing data or making multiple copies of the same file. Now we're sharing ideas, not merely sending spreadsheets.

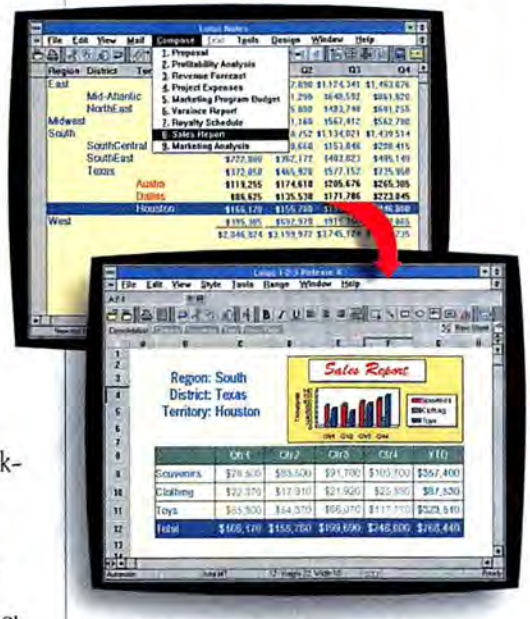
All this can be done over LANS, e-mail or even diskettes for that matter.

RAISE YOUR GROUP CONSCIOUSNESS.

Working Together with 1-2-3 can be



Version Manager lets each member of your workgroup know who made what changes to a file, when and why.



With Notes/FX, you and your workgroup can store, distribute, and manage 1-2-3 data in Lotus Notes. And with a simple click of your mouse, you will instantly be launched into 1-2-3 and the underlying spreadsheet to get the specifics.

further enhanced with Lotus Notes,® the market-leading groupware. Notes allows different users to access, track and share work on the same spreadsheet at the same time, with the full security of a Notes database. And it's all updated in real time. As a result, teams can collaborate to perform everyday business processes in ways never before possible. Ways that are faster and much more productive.

And with Notes/FX,™ you can not only access and share 1-2-3 data in a Notes database, you can double click in the Notes form and instantly be launched into the underlying spreadsheet in 1-2-3. Now you've got the spreadsheet power to edit the data.

Notes also features replication, so traveling team members are immediately up-to-date as soon as they reconnect to the network.

To join the hundreds of thousands who are switching to Lotus 1-2-3 Release 4, call **1-800-TRADE UP, ext. 9330,*** or visit your Lotus Authorized Reseller. It's not only easy to work with, it actually makes you easy to work with.

Lotus
Working Together®

rights reserved. Lotus, 1-2-3, Working Together and Lotus Notes are registered trademarks and Notes/FX and Version Manager are trademarks of Lotus Development Corporation. soft Corp. Quattro is a registered trademark of Borland International, Inc.

INTRODUCING THE EVOLUTION V ST

from ALR. As the newest member of ALR's EVOLUTION V family, this system delivers true record-breaking 60 or 66-MHz Pentium processor horsepower. Power that has earned the ALR EVOLUTION V family top honors from BYTE, InfoWorld, and PC/Computing. Engineered to maximize the Pentium processor, this powerful system boasts a 64-bit cache/memory design with your choice of 32-bit local bus architectures; VESA VL or PCI.

Large enough to hold gigabytes of storage and eight expansion cards, yet small enough to fit on a desktop, the EVOLUTION V ST is perfect for both small networks and expansion hungry power users. With four drive bays accessible from the front (six total), it's the ideal system for advanced desktop publishing, multimedia design, and other applications requiring both CD ROM drives and removable hard drives.

And the EVOLUTION V ST is covered by one of the most comprehensive service and support programs in the industry. Even a full year of ON-SITE service is FREE*

To order the EVOLUTION V ST visit your local ALR reseller or call ALR today.

Stylish, Fast and Pentium TECHNOLOGY POWERFUL

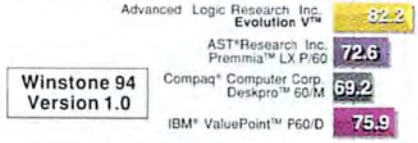
COMPARE!

	The ALR EVOLUTION V ST	The Compaq Deskpro XE 5/60
Pentium 60-MHz	YES	YES
External Cache	256-KB	OPTIONAL add $325*
VESA Local Bus IDE	YES (VL Systems)	NO
Integrated SCSI-II	YES (PCI Systems)	NO
Drive Bays	6	3
Available Slots	8	3
Power Supply	250 Watts	145 Watts
Warranty	5 Year/15 Month	3 Year
Price	**$2995**	**$3024**

*$2,799 plus $325

ALR bests three other 60MHz Pentium systems

Winstone 94 Version 1.0



Longer bar indicates better performance.

PC Week November 1, 1993 page 21. Winstone 94 measures overall system performance, using one script for each 12 popular Windows applications. It computes the amount of time each script takes to finish, and uses those times to produce an overall score. Timed results are weighted based on the relative market share of each 12 applications.

Starting as low as **$2495**

EVOLUTION V
- 60- or 66-MHz Pentium Processing
- Supports Pentium Write-Back Mode
- 8-MB RAM(Expandable to 128-MB)
- True 64-bit Data/Cache/Memory Path
- Integrated 256-KB Write-back Cache
- Integrated MULTUS (Multi-seeking) IDE Controller
- Six ISA Expansion Slots
- 3 32-bit VESA VL Local Bus Slots
- Six Drive Bays
- 200 Watt Power Supply

Starting as low as **$4995**

EVOLUTION V Q
- 60 or 66-MHz Pentium Processor
- Quadflex 128 Architecture (ALR Custom ASICS) with Dual 64-bit Path cache to Memory
- Supports Pentium Write-Back Mode
- Dual 256-KB (512-KB total) 64-bit integratedWrite-back Cache
- 16-MB RAM(Expandable to 1-GB)
- True 64-bit Data/Memory Path
- Ten 32-bit EISA Expansion Slots
- 3 VESA VL Local Bus Slots
- 13 Drive Bays
- 415 Watt Power Supply

FREE LOCAL BUS GRAPHICS*

*Limited time offer with the purchase of any EVOLUTION V or EVOLUTION VQ configured from ALR with a hard drive.

800-444-4ALR

ALR®

Advanced Logic Research, Inc.

ALR can be reached on Compuserve--GOALRINC

9401 Jeronimo Irvine, CA 92718 (714) 581-6770 FAX: (714) 581-9240

*One year free on site service requires registration fee of $9.95 Not available in all areas- call for complete details. Systems shown with optional monitors and equipment. Prices, specifications and configurations are subject to change without notice. Verify competitive pricing with manufacturer. Prices based on U.S. dollars. ALR is a registered trademark of Advanced Logic Research, Inc. Intel inside and Pentium logos are tradenarks of Intel Corporation. All other brand and product names are trademarks or registered trademarks of their respective owners. ©1993 by ALR

Circle 9 on reader service card

Getting Online, Better Than ProgMan, Offended UNIX Devotee

In the Nick of Time

Thank you for "The Best of Online Services" in October. It came just as I had decided to join America Online. I had spent six or seven weeks investigating all the online services available in order to make that choice. But your article provided all the information I needed in one place.

I joined America Online for two reasons: excellent E-mail, and PC World Online!

David Trevino via PC World Online

Higher Rates for Writers

In "The Best of Online Services" in October, George Campbell said that he sent a file to his client on America Online at 9600 bps. But America Online says it offers only 2400-bps service at this time, though it is considering offering 9600 bps. What gives? Do magazine writers get higher bps rates?

Jeffrey Boone via PC World Online

Author's response: Ooops! Actually, I did sign on to America Online at 9600 bps. Because *PC World* system operators were part of the team that beta tested 9600-bps access, I was given a list of 9600-bps access numbers. I thought those numbers were available to all subscribers, but I have since learned that wasn't the case.

I hope America Online will make 9600-bps service generally available soon. —*George Campbell*

Love of Plug-In

Big thanks to Contributing Editor Steve Bass for all the great information on Windows utilities in the September *Home Office*. I had already stumbled upon Trash Manager, but I've been using Plug-In for about 3 hours now, and I'm in love. It's got all the features that I always wished ProgMan had, and it really does make life nicer and more Macintoshlike (for a not-so-closeted Mac fan).

Kathryn S. Burke via America Online

Preference for UNIX

I object to Phil Lemmons' statement in October *Letters* that "UNIX has never been one operating system with one interface to attract software developers." Pardon my indignation, but this is not a description of the UNIX that I've known for years.

UNIX has been around far longer than MS-DOS. It is the backbone of Internet, with millions of users worldwide. UNIX versions of WordPerfect have existed since that program's inception. The list of PC software available under UNIX not only fills volumes, it includes some of the best business and scientific software. Finally, to say "there are millions more Macs than UNIX workstations" is absurd. Quite the contrary is true.

The unspoken implication that Windows is now the user interface of choice ignores the large cadre of computer users who have no interest in Windows.

Louis F. Mueller, Tallahassee, Florida

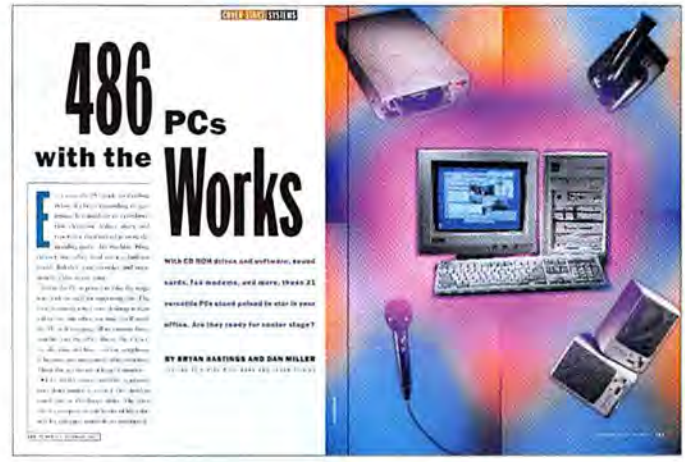
Glaring Deficiency

I want to commend your vigorous evaluation of the systems in "486 PCs With the Works" in September. But I need to point out one glaring deficiency. With the sophisticated measurements you apply to many of a computer's attributes, it amazes me how little quantitative measurement you apply to the monitor.

In your evaluation of the Gateway 4DX2-66V, you note, "One nice bonus: a 15-inch CrystalScan monitor." Apparently, all you did in your evaluation was read the label. I recently purchased one of these machines, and when I set up the monitor, I noticed that it didn't seem any bigger than the 14-inch CrystalScan I have at work. I got out the tape measure and discovered that the actual video screen on the 15-inch monitor is 13 inches. The video on my 14-inch monitor at work is 12.5 inches.

In short, don't believe everything you read on the label.

Earle Greene, Perry, Florida



Editor's response: Mr. Greene has an excellent point. Not all 15-inch displays are created equal. Vendors base the published size of their monitor screens on the size of the monitor's cathode ray tube. But then they put a plastic bezel around the outer edge of the tube, which can reduce the size of the viewing screen. And you have to consider the size of the image that's actually beamed onto the screen. Image size can vary widely from monitor to monitor, depending on the monitor's ability to handle the wide spectrum of scanning frequencies. In future system and monitor reviews, we plan to evaluate visible screen size and, if possible, actual image size.

Help Me Take Out the Trash?

I would appreciate your advice in determining the best way to dispose of obsolete computer equipment. I bought a NorthStar system in 1982. It cost about $12,000 then but has almost no value now and is taking up space in my

ROBERT CARDIN

basement. I'd like to know if there's a reasonable alternative to leaving it on the curb for the trash collectors. I'm not looking for any financial gain, just to dispose of the equipment in the most responsible manner.
Robert A. Kadison, New Rochelle, New York

Editor's response: A number of organizations are set up to accept donations of used PC equipment, which they give to needy groups in the United States and throughout the world (see *Consumer Watch*, December 1993). If none of them can use your old computer, try checking locally for a firm that salvages recyclable materials.

An Excellent Imperative

Thanks to Randy Ross for "The Telecommuting Imperative" in September's *Top of the News*. It is an excellent article, highlighting all the benefits of telecommuting: productivity, profitability, personnel retention, and compliance with environmental legislation. In the Shenandoah Valley, 75 miles from Washington, D.C., the Winchester–Frederick County Economic Development Commission has established a telecommuting center. Equipped with 100 workstations, the center will support some of the several thousand workers who commute daily to offices in the capital area to work on computers.

This telecommuting project is a leap forward in preserving the famed but fragile Shenandoah Valley and returning some semblance of family life to supercommuters who live here.
Dan Malone, Winchester–Frederick County Economic Development Commission, Winchester, Virginia

Jump-Starting Windows

I found "Turbocharging Windows" in October very informative. I especially enjoyed the inclusion of VidTech's GraphMax LB. I applaud the unique method you chose to test the products. Comparing the way accelerator boards perform under different applications provides a much broader view to help the buyer make a decision.

I do have one complaint. You say that VidTech uses jumpers to set the refresh rate. This is not true. The board does have jumpers, but they are factory set and have nothing to do with the refresh rate. Our refresh rate is set through software.
Walter J. Stull, Chief Operating Officer, VidTech Microsystems, Minneapolis

Quicken Wronged

I would like to correct a statement in "Quicken: More Than Checks" in October's *Top of the News*. The article says that Quicken doesn't calculate an annualized return for individual securities from the date of acquisition. This isn't true!

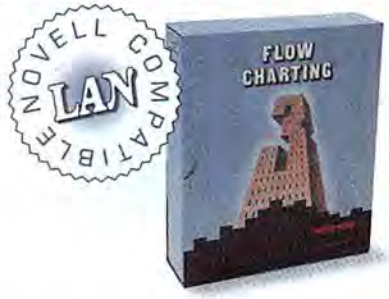
Quicken's standard investment performance report calculates annualized rates of return by individual securities or by your entire investment portfolio.
Jacqueline Maartense, Product Marketing Manager, Intuit, Menlo Park, California

Printer Dispute

In August's *New Products*, "Photo-Quality Color Printing Hits a Brilliant Price" inappropriately characterizes the technology used in the Kodak ColorEase PS printer as "near dye-sublimation quality."

ARE YOU SPENDING TOO MUCH TIME DRAWING FLOWCHARTS?

YOU NEED FLOW CHARTING™ 3.



Every day, professionals worldwide save time and money using Flow Charting 3. It's fast, efficient, easy to use, and always produces presentation-perfect charts and diagrams.

With Flow Charting 3's built-in flexibility, you can create customized charts using a variety of shapes, lines, and text—placed where you want them.

Plus, Flow Charting 3 is now available in a LAN version. Making it easy to share files and set up work groups for specific projects.

And it's backed with free technical support and a 90-day no-risk guarantee. So if you're spending too much time drawing charts, call for a free demo and see for yourself what makes Flow Charting 3 the best-selling flowcharting software.

See your dealer today! Or for a free interactive demo disk,call 1-800-525-0082, ext. 252
International: 408-778-6557, ext. 252

Novell is a registered trademark of Novell, Inc.

PATTON & PATTON
Software Corporation

Excellence in charting the flow of ideas!

Patton & Patton Software Corp. 485 Cochrane Circle, Morgan Hill, CA 95037

Circle 233 on reader service card

COREL DRAW!™

Microsoft Windows-Compatible

The Best in Graphics

...and more!

Get animated with CorelDRAW 4!

Create Dazzling Illustrations

PAGE LAYOUT
CHARTING
ILLUSTRATION
PHOTO-PAINT
TRACING/OCR
PRESENTATIONS
FILE MANAGEMENT
ANIMATION

CorelDRAW is renowned for its powerful graphics capabilities. CorelDRAW 4 now leaps even further ahead by adding page layouts, animation and OCR, as well as hundreds of other feature enhancements. It's the best value in software today–and it's still the easiest to use!

CorelDRAW 4 is the ideal desktop publishing tool! It includes illustration, charting, photo-editing, tracing/OCR and presentation capabilities...and so much more! There are advanced word processing features, multi-page layouts and dozens of artistic and special effects. It's packed with more fonts, more clipart images and symbols, more graphic tools and business applications. And now CorelDRAW 4 also includes CorelMOVE, a brand new animation module.

- **Comprehensive DTP Features**
- **Flexible Multi-Page Layouts**
- **Enhanced Word Processing**
- **Advanced Direct Scanning**
- **Powerful OCR (Optical Character Recognition)**
- **Single-Step Business Forms Tracing**
- **Thousands of Fractal Textures and Fills**
- **Dazzling Artistic Tools and Special Effects**
- **Convenient Spreadsheet and over 80 Chart Styles**
- **Object Data Management**
- **Over 5,000 "Drag and Drop" Symbols and Shapes**
- **Over 18,000 Clipart Images and Symbols**
- **Over 750 Fonts (650 Bitstream and ITC)**
- **Complete Color Separations**
- **On-line Help**
- **20 Photo-Paint Filters and 14 Image Correction Filters**
- **37 Import/Export Filters**
- **21 Transition Effects**
- **Over 200 Animated Flics**
- **Over 400 Cartoons**
- **Over 750 Actors, Props and Sounds**

18,000 CLIPART images and symbols
750 FONTS

ALSO INCLUDES TWO VALUE-PACKED CD-ROMs
–featuring a complete CD version of CorelDRAW 4, plus libraries of clipart images and symbols, fonts, animation elements, sound effects and a Video for Windows enhanced QuickTour.

CalComp
6"x9" Drawing Slate with pressure pen

Bundle Offer! U.S. FUNDS $499.98 With CUE Discount

Call for the location of the Egghead software store nearest you. To order directly from our Eggspress Ordering Service, please call 1-800-EGGHEAD.

EGGHEAD SOFTWARE
North America's Software Eggsperts.
Hearing and Speech impaired customers can reach us by calling 1-800-949-3447 TDD.

Eggspress Ordering 1-800-EGGHEAD Call Direct

COREL 1-800-772-6735 ext. 23

KUR-CO15-1

Circle 93 on reader service card

Perhaps you'd like to consider a more rational approach to choosing a portable computer system.

As any decision maker knows, making decisions is tough. Especially the big ones. At least we can make the job of choosing a portable computer system a little easier by introducing a rather remarkable item: the AST Bravo NB. It's compact, lightweight, and comes with local bus graphics for speed. An integrated trackball. Complete PCMCIA connectivity. Even dual scan color. In fact, the Bravo NB has most of the significant features found in other advanced notebooks, with one notable exception: Ours has a reasonable price tag. As it starts at $1,699,* we'd understand if you lost your power of rational thought and acted impulsively. (Which is why we've included our phone number.)

AST. COMPUTER

The Product Of Our Obsession.

©1993 AST Research, Inc. All rights reserved. AST, AST logo are registered trademarks and ExeCare is a trademark of AST Research, Inc. The Intel Inside logo is a

BRAVO NB

POWERFUL

Intel 486SX/25 microprocessor with integrated 8KB cache. Pre-installed DOS 6.0, Windows 3.1, and B-Tools business utility software. Environmentally friendly NiMH battery pack for extended computing life.

ERGONOMIC

Just 5.5 pounds and 1.5 inches high. Integrated trackball, silent travel keyboard with 12 function keys.

GRAPHIC

Active matrix, dual scan, and monochrome displays. Accelerated local bus graphics with 512KB video memory. 256 simultaneous colors.

EXPANDABLE

One PCMCIA Type III industry-standard enhancement slot. 4MB RAM (expandable to 20MB), up to 170MB hard drive.

RELIABLE

ExeCare™ Plus: one-year warranty with free 48-hour expedited repair. Technical assistance 24 hours a day, seven days a week.

*Starting at $1,699.**

Call for more information and the nearest reseller.

800-876-4AST

intel inside

*registered trademark of Intel Corporation. All other trademarks are the property of their respective owners. *Estimated U.S. reseller selling price. Reseller pricing will vary.*

AnthroCarts®!

AnthroCarts will knock your socks off! Imagine how great it'll be when you find the perfect furniture for your equipment — just the right size, tough as nails construction and dozens of accessories.

And you'll find our service so real and responsive, you'll get a kick out of ordering direct!

Call for a free catalog!

Lifetime Warranty.

Adjustable for all sizes.

Lots of choices.

ANTHRO®

800-325-3841

3221 NW Yeon St.
Portland, OR 97210
Fax: (800)325-0045

GSA contract no. GS-00F-5040A. Available for OEM applications. Prices from $159.00
Anthro, AnthroCart and Technology Furniture are registered trademarks of Anthro.

Dye-sublimation terminology came about because the dyes used in the early days of this technology were characterized as sublimal. As the process became better understood, however, it was learned that the dyes transfer by diffusion. Thus the dye-transfer process in printers with resistive thermal printheads is more accurately described as dye diffusion.

The Kodak ColorEase PS printer uses the same technology as the award-winning Kodak XL 7700 printer introduced in 1990 as well as all the other commercially available resistive-head dye-transfer printers. A better statement would describe this class of printer as near photographic.

David A. Johnson, Daniel J. Harrison; Eastman Kodak Co., Rochester, New York

Corrections and Clarifications

In October's *New Products*, we stated that QEMM 7.0 freed up 638K of RAM. Actually, it frees up only 631K.

October's *New Products* also included an incorrect list price for Harvard Graphics 2.0 for Windows. The correct price is $395.

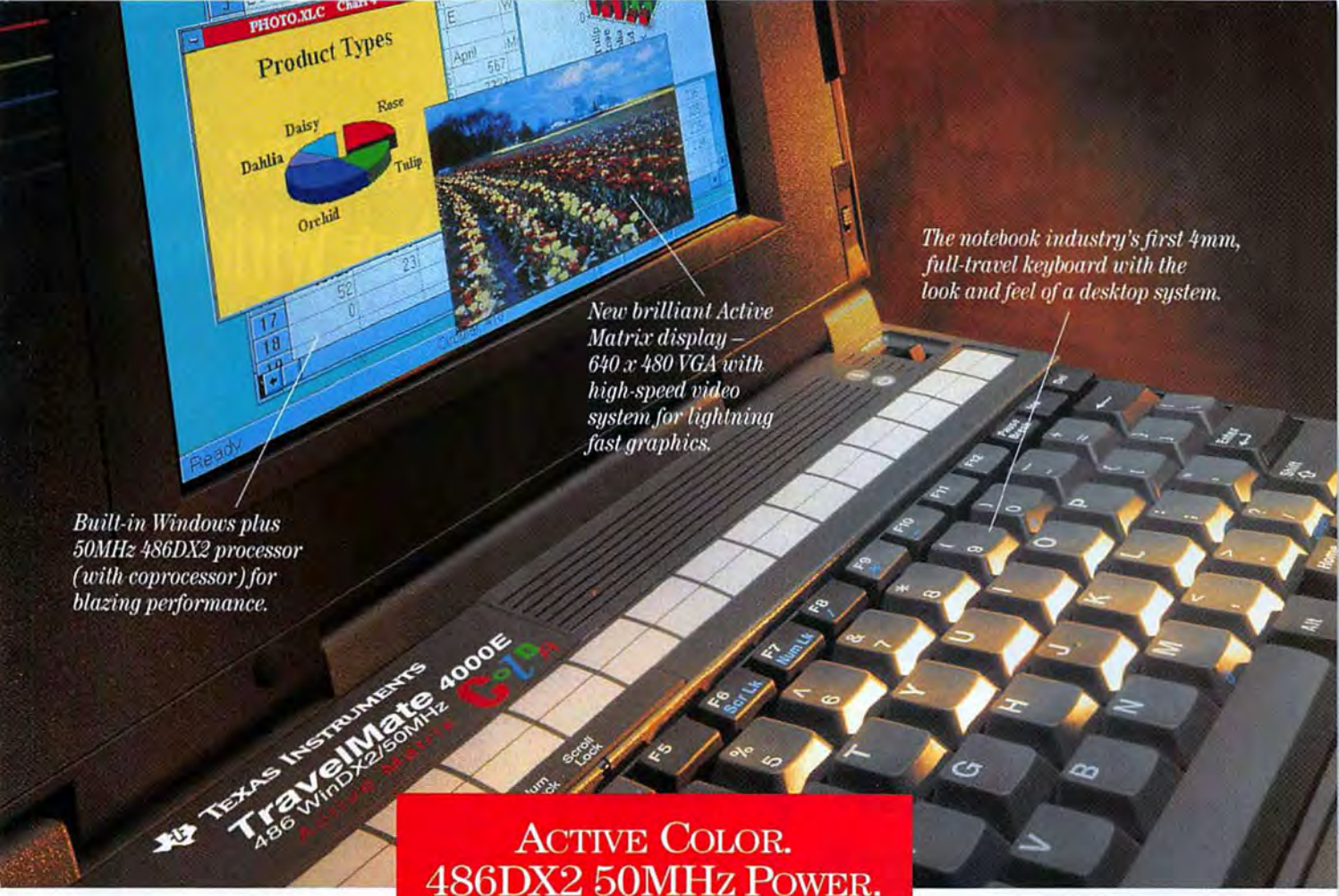
The table on page 194 of "NT Applications: The Waiting Game" in the October issue should have indicated that Great Plains Software plans to support NT on both the Pentium and DEC Alpha platforms.

In the table on page 218 of "Turbocharging Windows" in October, the lengths of the bars represent the results inaccurately. The numbers are correct.

The feature set of Ami Pro 3.01 was inaccurately represented in a chart on page 76 of November's *Top of the News*. Ami Pro supports context-sensitive icon bars, personal and shared style sheets, automated templates, individually identified annotations, individual configurations for LAN users, and the inclusion of envelopes in a mail merge. In addition, we should have noted that while Ami Pro does not offer right-click context-sensitive menus, it does offer right-click formatting dialog boxes for some features. You can also customize the keyboard under Ami Pro by assigning macros to keyboard shortcuts. Finally, Ami Pro supports the ability to draw on a page via a graphics frame, and you can rotate text.

PC World regrets the errors.

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

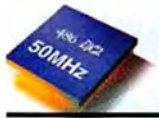


ACTIVE COLOR. 486DX2 50MHz POWER. WINDOWS IN 15 SECONDS. HEY, WHAT ARE YOU WAITING FOR?

If you've been waiting for an active matrix color notebook with true desktop power, your wait is over. Thanks to the new TravelMate™ 4000E WinDX2™/50 Active Matrix Color notebook from Texas Instruments.

With 256 brilliant, simultaneous colors and a 50MHz 486DX2 processor, this powerhouse doesn't just whisper color, it screams it.

50MHz DX2 processor with coprocessor provides desktop performance in a notebook.



And yet the TravelMate 4000E weighs a mere 6.2 pounds, including battery. This convenient size and weight gives you more performance* than the leading 486 notebooks. And the industry's first 4mm, full-travel keyboard gives you the feel of a desktop.

Of the leading active matrix color notebook manufacturers, only TI offers the desktop performance of a 50MHz DX2 processor.

Active Color Notebook	*Weight (lbs.)*	*486 Processor*	*Speed*	*Coprocessor*
TravelMate 4000E	**6.2**	**DX2**	**50MHz**	**Yes**
Toshiba T4600C	6.9	SL	33MHz	Yes
Compaq LTE Lite 4/33c	6.5	SL	33MHz	Yes
IBM ThinkPad 720C	7.6	SLC2	50MHz	No

Thanks to built-in Windows 3.1 and useful TI utilities, you can power up to Windows in just 15 seconds. And the TravelMate 4000E is Windows NT-compatible. With 4MB of main memory, expandable to 20MB, you're ready for today's and tomorrow's software.

If you work on the go, you'll also go for the rugged 200MB hard disk drive, the high-speed video bus and 1MB of video RAM, as well as the full range of connectivity options – snap-on modules for Ethernet® LANs, SCSI-compatible devices and an internal 14,400 bps V.32 bis modem with 9,600 bps send/receive fax capability.

For more information about the only 486 notebook family that won five Editor's Choice awards in PC Magazine's August issue, call *1-800-527-3500*.

TI TravelMate 486DX2 Notebooks

50MHz Active Color
50MHz Monochrome
40MHz Enhanced Passive Color

intel inside

EXTENDING YOUR REACH WITH INNOVATION™

TEXAS INSTRUMENTS

*Based on industry standard application performance speed tests. TravelMate, WinDX2 and "Extending Your Reach With Innovation" are trademarks of Texas Instruments. Ethernet is a registered trademark of Xerox Corp. The Intel Inside logo is a trademark of Intel Corp. ©1993 TI.

Circle 244 on reader service card

No Matter What Kind Of Notebook You Have, Take 15 Years Of Reliable Hayes Technology With You.

Hayes Introduces Multi-Platform Solutions For Mobile Computing.

OPTIMA 144 DATA + FAX144 for PCMCIA **$399**

$399 OPTIMA 144 + FAX144 Pocket Edition

OPTIMA FAX96 for PCMCIA **$299**

For fifteen years Hayes has been providing reliable modems for desktop communications. Now you can take that same confidence on the road. Introducing Hayes® OPTIMA™ Mobile Communications products.

Hayes OPTIMA 144 Data + FAX144 and OPTIMA FAX96 modems for PCMCIA provide dependable performance for notebooks or PDAs with PCMCIA Type II slots and above. For remote applications as well as convenient desktop use with PCs and Macs™, there's the stylish Hayes OPTIMA 144 + FAX144 Pocket Edition®. If you're looking for economical, portable FAX capability, choose the Hayes OPTIMA FAX96 for PCMCIA. It comes with a 2,400 bit/s data modem, low power consumption ideal for PDAs, and a great low price. And all OPTIMAs have Hayes® AutoSync for synchronous transmissions without an adapter card.

To get you communicating fast, easy, and FREE, our PCMCIA modems come with Smartcom™ for Windows™ LE communications software, and Windows Fax software. The OPTIMA Pocket Edition comes with Smartcom II® and Smartcom™ FAX for the Mac™, or full-featured Smartcom for Windows and Windows FAX software for PCs.

For more information on our mobile computing solutions for almost any need, call **800-96-HAYES**, or call our FAX back service *Hayes FAX Response* at **800-HAYES-FX** and request Document 144. In Canada, call **800-665-1259**.

Hayes®
Increasing the Speed of Business.™

Go *Online With Hayes* BBS; call 800-874-2937 or 404-446-6336.

©1993 Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348. Hayes, the Hayes icon, the Hayes logo and Pocket Edition are registered trademarks, and the Hayes '302 Escape Sequence Patent icon, Increasing the Speed of Business, OPTIMA, and Smartcom are trademarks of Hayes Microcomputer Products, Inc. Other trademarks are those of their respective companies. Prices are estimated retail and are in U.S. dollars.

Circle 105 on reader service card

New CDs Let You Try Software On for Size

How many times have you been dazzled by the superlatives on the outside of a software package, and then taken the box home only to find that the product didn't live up to the hype? Well, soon you may be able to try a new application on your own PC *before* you surrender your credit card.

In November, a handful of companies started offering CD ROM disks containing dozens of encrypted applications, from mainstream business productivity packages to games and utilities. From the sound of things, the CDs will be available just about everywhere by year-end. You'll likely find them on display near checkout registers (like candy and other impulse items) at national chains such as CompUSA, Software City, and Software, Etc. Though many of the disks carry a suggested retail price of around $10, some stores will probably give them away as a promotion. The disks will also be bundled with CD-ready PCs from IBM, Compaq, Gateway, and others, as well as with CD ROM drives and multimedia upgrade kits from such notables as MediaVision and Creative Labs.

Though the precise implementation varies, all the CDs follow some basic principles: You'll get to review product literature and, in many cases, try the software you're considering (though the first CDs may include more marketing literature than usable software). If you find something you like, you call an 800 number and give your credit card number along with a CD-specific code to your salesperson, who gives you a second code that unlocks the application.

Developers will take a couple of approaches to entice you to try their software. One is to include a "limited version" of the package on the disk—say, without the print or save functions; another is to give customers full use of the package but limit the number of times—or the length of time—they can use it. You'll probably see a range of approaches within any given disk.

No Shortage of Players

Right now at least seven companies will offer general-interest disks: Softbank, which includes distributor Merisel among its investors, is selling On-Hand; Apple will resell Windows applications as part of its Software Dispatch program; IBM has its CD Showcase; distributor Ingram-Micro is offering CD-Access; TestDrive Corporation has SuperStore; and InfoNow is bundling its CD with various OEM systems. Gateway packages the InfoNow CD as Store-on-a-Disc, and IBM packages it under the name Options by IBM.

Start-up KidSoft of Los Gatos, California, is targeting its CD at children and their baby boomer parents. In October the company released the first edition of its Club KidSoft CD and accompanying magazine/catalog. The combo is sold on newsstands and by subscription and features educational software for children 4 to 12 years old. Customers can order software that's on the CD and products listed in the catalog.

Software test drives won't be limited just to PC users with CD ROM drives, though. In addition to its CD ROM product, IBM is now marketing a floppy-disk–based encryption technology to software developers. Whereas the CDs will feature multiple products, the floppy disks will include just one "locked" software package that you'll be able to try out and then order, much as you would the applications on CD.

At one level, these products all work and sound about the same, but there are important differences among them. Most critical, perhaps, is which applications are included on the CDs and the degree to which customers can use the individual applications, rather than just reading marketing literature or going through a canned tutorial.

In its most useful form, a CD will

By Roberta Furger

ROBERT HOLMGREN

KEEPING UP

Eco-conscious PC users may want to take a look at Eco Tech's Eco Disc recycled floppies. Eco Tech (713/444-6074) buys unused disks from software and hardware companies, erases them, checks them for viruses, and reformats the disks for Macs and PCs. Costs of the disks vary, depending on the quantity purchased...There *is* life after Chapter 11. Some good news from CompuAdd Computer. The Austin, Texas, company emerged from Chapter 11 bankruptcy in November, four months after filing...Shopping for a Better World couldn't be easier with the release of a $39.95 software package of the same name from Heartbeat Software of Waltham, Massachusetts. The software rates thousands of consumer products based on the manufacturers' policies and practices in areas such as the environment, charitable contributions, community involvement, and workplace issues...A new California law protects consumers from being left out in the cold if their computer repair company goes under. The law, which covers firms doing business in California, requires companies to demonstrate financial solvency or to take out an insurance policy to cover the cost of all outstanding contracts. Pennsylvania, Florida, North Carolina, Virginia, and Connecticut have enacted or are considering similar legislation.

REPRINTS
IN AN
INSTANT

Need the latest tips for Windows?
Looking for an article you missed?

Use PC World's
FAX-ON-DEMAND
system to receive information instantly and easily — 24 hours a day!

1 CALL HOTLINE

1-800-234-0455

ext. **965** - FREE Catalog of Reprints
ext. **265** - To Order Reprints $4.95/each
(fees charged to Visa or Mastercard)

OR,
Order Reprints By Calling:

1-900-773-2972
($4.95 charged to telephone bill)

Reprints topics include:
- Product Reviews
- Windows & DOS Tips
- Mobile Computing

2 REQUEST INFORMATION

1. Enter the document number that corresponds to the article(s) you want to receive.
2. Enter your fax number.

3 RECEIVE INSTANTLY

...by FAX

PC WORLD

Touchtone phone required. Please have 3-digit category number, credit card number (800 toll-free calls only) and fax number ready when you call. Under 18 requires parental consent. Please call 415-243-0500 with questions or comments.

include all the major players in any given product category (as well as a lot of the not-so-well-known packages). You'll go through each product and decide which meets your needs—at your own pace, and on your own PC. It's a revolutionary concept. Not only does it give customers the ultimate control over what they buy, it also (in theory, at least) levels the playing field for all developers, big and small.

Several CD producers have lined up Borland, Lotus, and WordPerfect, but so far only a few have signed even limited agreements with Microsoft. Softbank and InfoNow have contracted with the software giant, but under the terms of these agreements, all Microsoft products must be on a separate disk from that of competitors.

Microsoft is evaluating other CD ROM options but needs to test the security features of each technology fully before signing on, says Mike Negrin, director of distribution strategies.

As for including "test-drivable" software, Negrin says he's not convinced that users will want to try a variety of packages before choosing which one to buy.

Details, Details, Details

Besides finding out what software is available for a test drive, you'll need to consider a handful of other issues. First, check out the version number of the application you're evaluating. Most of the companies will update their disks quarterly, so it's possible that the CD and shrink-wrap versions will be out of sync at times. Companies are still working out the details on how they'll handle updates, but most expect they'll make arrangements to ship the latest version once an order is placed.

Documentation is another issue. InfoNow and TestDrive are shipping documentation and original floppy disks automatically to all software buyers. Other companies will send documentation, but they'll charge a shipping and handling fee.

Clearly, there are bugs—as well as a few other annoyances—to be worked out. The first CD releases won't include interactive copies of all the packages available for unlocking. Instead, they'll include some sort of limited demo or just the marketing literature for you to review. Over time, the number and variety of products should increase, as should the interfaces and value-added services provided by the CD producers. Already some companies are talking about differentiating their products with such extras as software giveaways and targeted offerings for special niche markets.

Although some retailers are more than a little worried that the CDs will cut into their sales, it seems doubtful that CD shopping will ever completely replace browsing for new titles at your local store. But CDs give PC users the first real opportunity to evaluate software *legally* and make sure it meets their needs before they spend their money.

Shop Talk

Cheaper But Not the Same

When my Panasonic KX-P1124i dot matrix printer started having problems, I called the toll-free tech support number. I waited on hold for about 10 minutes before I was connected to someone who could discuss my problem. As I described what was wrong, he cut in and asked if I had a Panasonic ribbon in my printer. I didn't; I was using a generic brand. He yelled at me and said my warranty was no good if I wasn't using a Panasonic ribbon. Next, I took my printer in to an authorized service center. As soon as I put the printer on the counter in the service center, the representative told me he couldn't work on it unless it had a Panasonic ribbon and offered to sell me one for $18. Nowhere in the Panasonic manual does it warn against the use of generic ribbons. Computer users love to shop around for a good deal. If we can get a ribbon at half the price, we'll do it if no one tells us about the dangers.

Maggie Trapasso, Rock Hill, South Carolina

Editor's note: Ron Tomczyk, public relations manager for Panasonic, confirmed that the warranty on Panasonic printers does not cover damage caused by generic products. Therefore, while you may save money if you use a generic ribbon, you risk voiding the warranty if the ribbon damages your printer. None of the printer experts we spoke with had ever heard of a ribbon damaging a printer, although manufacturers say using their own ribbons can make the printhead last longer. Still, you might want to make sure you have a product-specific ribbon in your printer when you bring it in for warranty repairs.

Trapasso's printer turned out to be cov-

How Confident Are You With Your Surge Protector?

I'm so confident in my surge protectors, I've placed high stakes on their performance. When it comes to protection, warranty and value, Curtis® beats them all.

Superior Technology— Our engineers have researched and developed the most superior line of surge protectors available today. They used the latest technology — High Energy Absorption MOVs — which give our surge protectors

the **HIGHEST ENERGY rating in their class.**

Thomas W. Judd
President of Curtis Manufacturing

Complete Warranty— We guarantee our surge protectors' performance AND **we cover your connected equipment up to**

$25,000.00
(depending on model purchased).

Best Value— Curtis surge protectors incorporate superior technology with high quality construction. All of our surge protectors are value priced and backed by the most comprehensive warranty available.

Compare Protection, Compare Warranties, Compare Price—Curtis has it all inside and out!

Manufacturing Company, Inc.
CURTIS
30 Fitzgerald Drive, Jaffrey, NH 03452
©copyright 1993, Curtis Mfg. Co., Inc.
All Rights Reserved

For more information call Curtis 1-800-955-5544 Ext. 240

Save Disk Space

PKZIP®

PKZIP version 2.0

PC WORLD

PKWARE introduces the next generation of its award winning compression utility, giving even greater performance levels than achieved with previous releases of the software. PKZIP compresses and archives files, saving disk space and reducing file transfer time.

WORLD CLASS AWARD

Software developers, you can significantly reduce product duplication costs by decreasing the number of disks required to distribute your applications. Call for Distribution License information.

Put Your Executables on a Diet

Software Developers, save disk space and media costs with smaller executables. You can distribute your software in a compressed form with PKLITE Professional.™ PKLITE Professional also gives you the ability to compress files so that they cannot be expanded by PKLITE, hindering reverse engineering of your programs.

PKLITE increases your valuable disk space by compressing executable (.EXE and .COM) files by an average of 45%. The operation of PKLITE is transparent, all you will notice is more available disk space!

Compression for YOUR Application

The PKWARE Data Compression Library™ allows you to incorporate data compression technology into your software applications. The application program controls all the input and output of data, allowing data to be compressed or extracted to or from any device or area of memory.

All Purpose Data Compression Algorithm compresses ASCII or Binary data quickly. An adjustable dictionary size allows software to be fine tuned for maximum compression or speed. The routines can be used with most popular languages, such as C, C++, Pascal, Assembly, Basic and Clipper.

PKWARE® INC.

The Data Compression Experts®

9025 N. Deerwood Drive Brown Deer, WI 53223
(414) 354-8699 Fax (414) 354-8559
Internet: pkware.inc@mixcom.com

PKZIP $47.00 PKLITE $46.00 PKLITE Professional $146.00
Please add $3.50 S&H per package in the US & Canada, $5.00 overseas.
Wisconsin residents add 5% state sales tax & applicable county sales tax.
Visa and Mastercard accepted, no COD orders.

PCW1/94

Circle 212 on reader service card

ered under warranty, and Panasonic has promised that it will be sending her a complimentary ribbon for her trouble.

The Cost of Memory

I saw an ad in the September issue of *PC World* for a Northgate 486SX priced at $999. I immediately called to order it, but Northgate told me there was a surcharge because of a memory shortage.

Then I noticed a disclaimer in the ad—in very small print—reserving the right to increase prices. Maybe it was legal to apply the surcharge, but to do so right after the ad was published was unethical. I can't believe that a major company can't foresee pricing trends well enough to match its advertising with its costs. I must assume the company was just trying to skin a few suckers.

Andrew Moriber, Miami Beach, Florida

Editor's note: Mark Bolick, sales manager for Northgate, told us that the ad in question was submitted to *PC World* three or four weeks before the ship date of the September issue. Right about that time there was an explosion in the resin plant in Sumitomo, Japan, that manufactures 60 percent of the world's supply of the resin used in DRAM memory. This caused the market price for memory to double—not just for Northgate but for all computer manufacturers (see "Memory Price Madness" in the September 1993 *Top of the News*). Northgate, according to Bolick, could no longer afford to offer systems at the price quoted in the September ad. Dave Sanny, senior systems engineer at Northgate, said the company is watching the price of memory and will reduce or eliminate the memory surcharge as soon as its cost decreases.

Duped?

I ordered an Ansel All-in-One Ethernet Model 1000 Parallel Port Adapter from Misco America, in Holmdel, New Jersey. It was advertised as being Novell Labs authorized, tested, and approved.

The product I received didn't function properly, so I returned the adapter to Ansel for a replacement. The second adapter functioned, but only marginally. After talking with Ansel's support staff, I returned the replacement, too. The third adapter functioned just like the second.

Finally, during a conversation with an individual from Novell technical support, I

PRESENTATION TASK FORCE CLIP ART KNOCKS OUT THE COMPETITION!

For quality and value, there are NO contenders!

If you're looking for a comprehensive collection of high quality clip art that can be used with over 60 DOS, Windows and OS/2 business applications (see sidebar) ... consider Presentation TASK FORCE 4.0.

PTF 4.0 is the ONLY clip art library to give you **3,500 full-color CGM images** in a MASSIVE, all-in-one collection. At only $199.00, PTF 4.0 is widely recognized as today's best clip art value. Smaller collections, with far fewer images can cost you hundreds (often thousands) of dollars more!

And that's not all! PTF 4.0 includes a **FREE "Color to B&W" Conversion Utility** ($59.00 value) that allows you to optimize PTF color files for dynamite-looking output on b&w printers.

Short on hard disk space? No problem. PTF images are uncompressed, and can be accessed directly from floppy disks. Install the complete collection, or any combination of individual image categories to your hard disk. You decide!

It's unanimous! Presentation Task Force 4.0 delivers a powerful one-two combination of both quality and value, making it the undisputed heavyweight champion of the clip art world.

"Outstanding value & excellent art to boot! ...by far the best value of all the clip art libraries we reviewed."
PC Computing (May 1992)

Presentation TASK FORCE

WORKS WITH:

- ALDUS FREEHAND
- AMI PROFESSIONAL
- APPLAUSE II
- CHARISMA
- CORELDRAW!
- DESIGNER
- DRAWPERFECT
- EXPRESS PRESENTER
- EXPRESS PUBLISHER
- FREELANCE GRAPHICS
- FREELANCE GRAPHICS FOR WINDOWS
- HARVARD DRAW
- HARVARD GRAPHICS 3.0
- HARVARD GRAPHICS FOR WINDOWS
- HIJAAK
- HIJAAK FOR WINDOWS
- HOLLYWOOD
- LOTUS 1-2-3
- MICROSOFT EXCEL 4.0
- MICROSOFT PUBLISHER
- MICROSOFT WORD FOR WINDOWS
- MULTIMATE
- PAGEMAKER FOR WINDOWS
- PERSUASION FOR WINDOWS
- POWERPOINT FOR WINDOWS
- PRESENTATION EXPRESS
- PRESENTATION TEAM
- PROFESSIONAL WRITE PLUS
- QUATTRO PRO
- SCRAPBOOK+
- VENTURA PUBLISHER FOR WINDOWS
- WINDOWS DRAW
- WORDPERFECT 5.0, 5.1, 6.0
- WORDPERFECT FOR WINDOWS

PLUS DOZENS MORE!

Available at Software Resellers Everywhere!

PRESENTATION TASK FORCE IS A REGISTERED TRADEMARK OF NEW VISION TECHNOLOGIES INC. ALL OTHER PRODUCT NAMES ARE THE PROPERTY OF THEIR RESPECTIVE COPYRIGHT OWNERS. ALL PRICES SHOWN IN US DOLLARS (DEALERS MAY SELL FOR LESS). CANADIAN MSL $229.00. CALL FOR INTERNATIONAL PRICING. NEW VISION TECHNOLOGIES INC., 38 AURIGA DRIVE, UNIT 13, NEPEAN, ONTARIO, CANADA K2E 8A5 TEL (613) 727-8184, FAX (613) 727-8190

Circle 177 on reader service card

discovered that this device isn't authorized, tested, and approved by Novell. A call to Ansel confirmed this. I had been duped.

I called Misco's customer service and got a return merchandise authorization (RMA) number to send the merchandise back for credit. Then I bought a Xircom Pocket Ethernet Adapter II, which functioned flawlessly on the first try. It cost $120 more, but it works. It's troubling that it took four months to get this issue resolved, especially since it never would have occurred if Misco's advertisement had been correct.

David Smith, Bangor, Michigan

Editor's note: Misco told us that as a result of Smith's letter, it discovered Ansel had wrongly claimed this product was Novell tested and approved. Reddy Reddy, president of Ansel, told us that Ansel mistakenly printed an incorrect data sheet for its Parallel Port adapter. The product was submitted to Novell for testing but was later dropped from the product line because of difficulties in supporting it. But unfortunately, distributors already had the product and data sheet and were advertising it as Novell approved. Both Misco and Ansel apologized for the problems cause by the mistaken data sheet and the resulting ad.

Backpack® does Windows™ EPP Aware

It's fast. It's small. It's reliable. It's incredibly compatible.

Backpack is the best selling parallel port tape drive on the market. We'd like to tell you why.

With Backpack, tape backup is quick and simple. Just plug it into your printer port and it's ready to use. No hardware conflicts, no slots required. One model fits all IBM PCs, compatibles and portables, regardless of CPU speed.

Backpack can store up to 250MB on a tape using data compression, is completely QIC80 compatible, and reads QIC40 tapes.

With its compact size and 1Mbps transfer rate, Backpack is the smallest and fastest parallel port tape drive you can buy.

Micro Solutions is dedicated to the perfection of backup technology.

CD-ROM, hard drive, and diskette Backpack drives are also available. Call today for ordering information and a dealer nearest you.

Telephone 815.756.3411 FAX 815.756.2928

MicroSolutions

132 West Lincoln Highway DeKalb, IL 60115

Call Toll Free 800.294.1214

Circle 200 on reader service card

Falling Through the Cracks

MicroLogic recently refunded me the price of a MoreFonts upgrade. The refund process was more trouble than it should have been, but I got my money back. What then, you may ask, can be bugging me? The problem is, I didn't want to return the software in the first place. But, despite repeated phone calls and faxes to MicroLogic technical support and even to the sales staff, nobody ever called me back—not even to tell me that nothing could be done about my problem.

Does MicroLogic customer support exist?

Paul Rosenberg, Litchfield, Connecticut

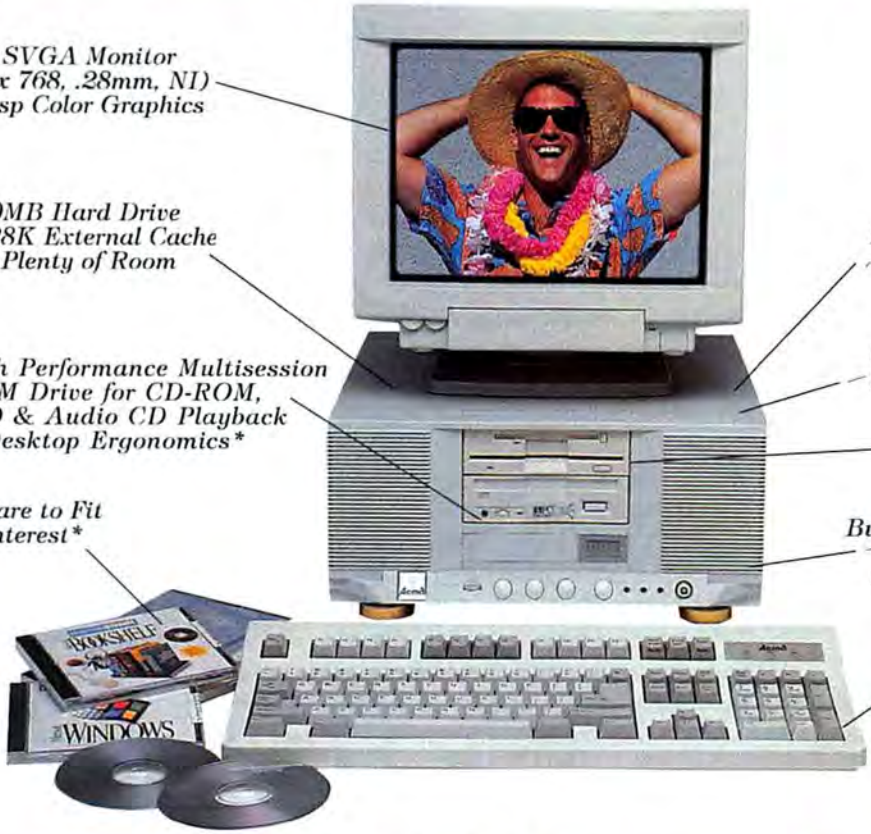
Editor's response: We got several letters about problems getting upgrades to MicroLogic's MoreFonts. MicroLogic's marketing coordinator, Lucy Allison, apologized for the problems. She explained that in 1992, MicroLogic used a direct-mail fulfillment house to process upgrades to MoreFonts and encountered many problems resulting from the way the firm handled customer inquiries. MicroLogic has stopped using the fulfillment house and now handles all of its own support. The correct number is 510/652-5464.

Above the Call

Recently I received a direct-mail circular touting the virtues of a utility called The Disk Duplication System from Kitz Technologies in Oshkosh, Wisconsin. Being a skeptic, I disregarded it. But after several occasions of DISKCOPY's multiple 'remove source disk, insert target disk' prompts, I figured that for $14.95 plus $3 shipping, it was worth taking a look.

I tried the software on my office machine first and immediately ran into a compatibility problem. So I took the software home and tried it on my generic 386. What I got was one of the slickest little programs I've ever used. It copies disks as fast as you can shuffle them. I was contemplating dragging my disks home from work to copy them, when I noticed the phrase in the installation

Whether for Business, Home or Entertainment, Acma has a Solution to Make You Smile



SPECIFICATIONS

- Intel 486 Processor
- 170MB Hard Drives
- 4MB RAM Exp to 32MB
- 128K External Cache
- 14" SVGA Color Monitor
- VGA Card with 1MB
- IDE Controller
- 1.44 or 1.2 Drives
- Desktop Case
- 101 Enhanced Keyboard
- 3 Button Serial Mouse
- Built-In Stereo Speakers*
- CD-ROM Drive*
- Sound Card*
- CD Software*

*MPC & MPC+ Systems Only

Your MPC Plus System comes with these CD-ROM software titles:

Sound Library, King's Quest, Mixed Up Mother Goose
Microsoft Bookshelf:
American Heritage Dictionary, Bartlett's Familiar Quotations, The Concise Columbia Dictionary, The Concise Columbia Encyclopedia, The Hammond Atlas, Roget's Electronic Thesaurus

ACMA PC SOLUTIONS

486SX/33 PC	$1399
486SX/33 MPC	$1699
486SX/33 MPC+	$1799
486DX/33 PC	$1499
486DX/33 MPC	$1799
486DX/33 MPC+	$1899
486DX2/50 PC	$1599
486DX2/50 MPC	$1899
486DX2/50 MPC+	$1999
486DX2/66 PC	$1799
486DX2/66 MPC	$2099
486DX2/66 MPC+	$2199

The New Acma 486 Multimedia Computer. The Latest Addition to the Family of Solutions From Acma.

Call & Order Today

47988 Fremont Blvd., Fremont, CA 94538
Direct: (510) 623-1212, Fax: (510) 623-0818
Nat'l/Corp.: 800-786-6888
Government: 800-578-1888

intel inside

COMPUTERS, INC. Acma

Prices & specifications subject to change without notice.
Prices do not include shipping & handling. Call to confirm configuration.
Intel Inside logo is a registered trademark of Intel Corporation.

Circle 66 on reader service card

BUG WATCH

1-2-3 release 4.0 for Windows

Lotus Development has released an update for 1-2-3 release 4.0 for Windows that ensures constant values, carried through a spreadsheet in formulas, remain constant. The update also fixes the problem encountered when printing the close parenthesis and problems with right mouse button support when running OS/2.

Registered users of release 4.0 for Windows will receive a free update automatically in the mail. The update is also available from the company and from the Lotus spreadsheet forum on CompuServe.

Lotus Development Corp.
800/343-5414

Microsoft Flight Simulator 5.0

A few armchair pilots have complained about pauses in Microsoft Flight Simulator that occur as the scenery changes. These delays result from the amount of memory required to load some of the new, improved scenery. If you're experiencing delays longer than 1 second, try using the SmartDrive disk cache included with DOS and Windows. If the delay is less than 1 minute, the problem may be that you don't have enough memory. (Microsoft says Flight Simulator will run slowly on systems with less than 1MB.) The only alternative, aside from upgrading your system, says the company, is to turn off the texturing. Unfortunately, this will take you back to the look of version 4.0 scenery.

Microsoft Product Support
206/637-9308

—Sarah Klein

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 with the broadest interest.

Sarah Klein is an editorial intern for PC World.

instructions, "We welcome your comments, either positive or negative..." I gave Kitz Technologies a call and talked to Jeffrey Kitz, the owner. After trying to revise my AUTOEXEC.BAT and my CONFIG.SYS files to resolve the incompatibility—without success—he told me he would work on the problem and have a solution the following week. That was Friday afternoon. First thing Monday, he called to tell me he was sending me revised software that would cure the incompatibility. Sure enough, the program works on my office computer.

I think Jeffrey Kitz went above and beyond the call of duty, and he's got a great product at a more than fair price.

Raymond Paesano,
North Huntington, Pennsylvania

Shop Talk *is researched and written by* PC World *assistant editor Christina Wood. Think you've gotten a raw deal—or a great one?* Consumer Watch *wants to hear the details. We'll investigate complaints and publish letters with the broadest interest. See page 12 for contact information.* ■

1993 PC WORLD ANNUAL INDEX

1993 ANNUAL INDEX
PC World P.O. Box 77436 San Francisco, CA 94107-0436

PLEASE SEND THE 1993 PC WORLD ANNUAL INDEX TO:

Name _____

Company _____

Street _____

City _____ State _____ ZIP _____

_____ printed copies only @ $3.25 each $ _____

_____ disks only (check format) @ $3.75 each $ _____

☐ 5¼-inch ☐ Windows
☐ 3½-inch ☐ DOS

SAVE BY ORDERING A SET (printed copy and disk)

_____ sets (check format) @ $6.00 per set $ _____

☐ 5¼-inch ☐ Windows
☐ 3½-inch ☐ DOS

TOTAL $ _____

INSTANT ANSWERS!

Need fast answers from back issues of *PC World*?

Want that review of the hottest 486DX2-66 systems?

Looking for the latest hard disk buyers' guide?

With *PC World*'s 1993 index, you'll have all the reviews, features, and how-tos at your fingertips in one easy-to-use reference. Choose a printed copy or a Windows or DOS disk. Or order a set! To order, fill out and mail the coupon at left. Enclose a personal or company check or a money order; do not send cash.

ORDER NOW!

THE #1 WINDOWS DATABASE

New Paradox makes your desk a ramp on the data superhighway

New Version 4.5

There's lots and lots of data out there. The trouble is, it has to go to the right place in order to be productive. That's the reason why we developed the new Paradox® Workgroup Edition. The only database with superior SQL connectivity and workgroup information sharing.

Share data easily with any workgroup

First we built in support for SQL servers* so you can work with information from corporate databases as if it were on your desktop. Then we added the Workgroup Desktop to distribute the data where it's needed. Now anyone with a Workgroup Edition of Paradox® can exchange data over local and wide area networks, or via electronic mail.† You can establish and modify workgroups instantaneously to meet the needs of a given project. *Everything you need is built right in!*

SQL

Best Windows database for all skill levels

Of course, no new version of Paradox would be complete without enhancements to the powerful and easy-to-use features that have made it the #1-rated Windows database. Built-in productivity Experts™ guide you at every step, from linking tables to building forms and reports. Object Inspector™ menus provide instant access to capabilities without searching through layers of menus. Paradox's ease of use stays with you as you move up the power curve. Corporate developers find that ObjectPAL,™ the fully integrated programming language, lets you create custom Windows applications that are powerful, graphical, and deliverable *fast*. Plus, 100% compatibility with Paradox DOS means your existing Paradox data will migrate automatically to your new Windows application.

When it comes to workgroup database productivity, nothing gets you where you want to go faster or easier than the new Paradox Workgroup Edition from Borland.

Welcome to life in the fast lane.

Limited-time offer!

$495 *Suggested retail price for new users.*

$149.95 *Upgrade price for Paradox, FoxPro, Access, Superbase, and Approach users. $20 rebate for Paradox Windows 1.0 owners.*

90-day, money-back guarantee

See your dealer today or call 1-800-336-6464, ext. 7540

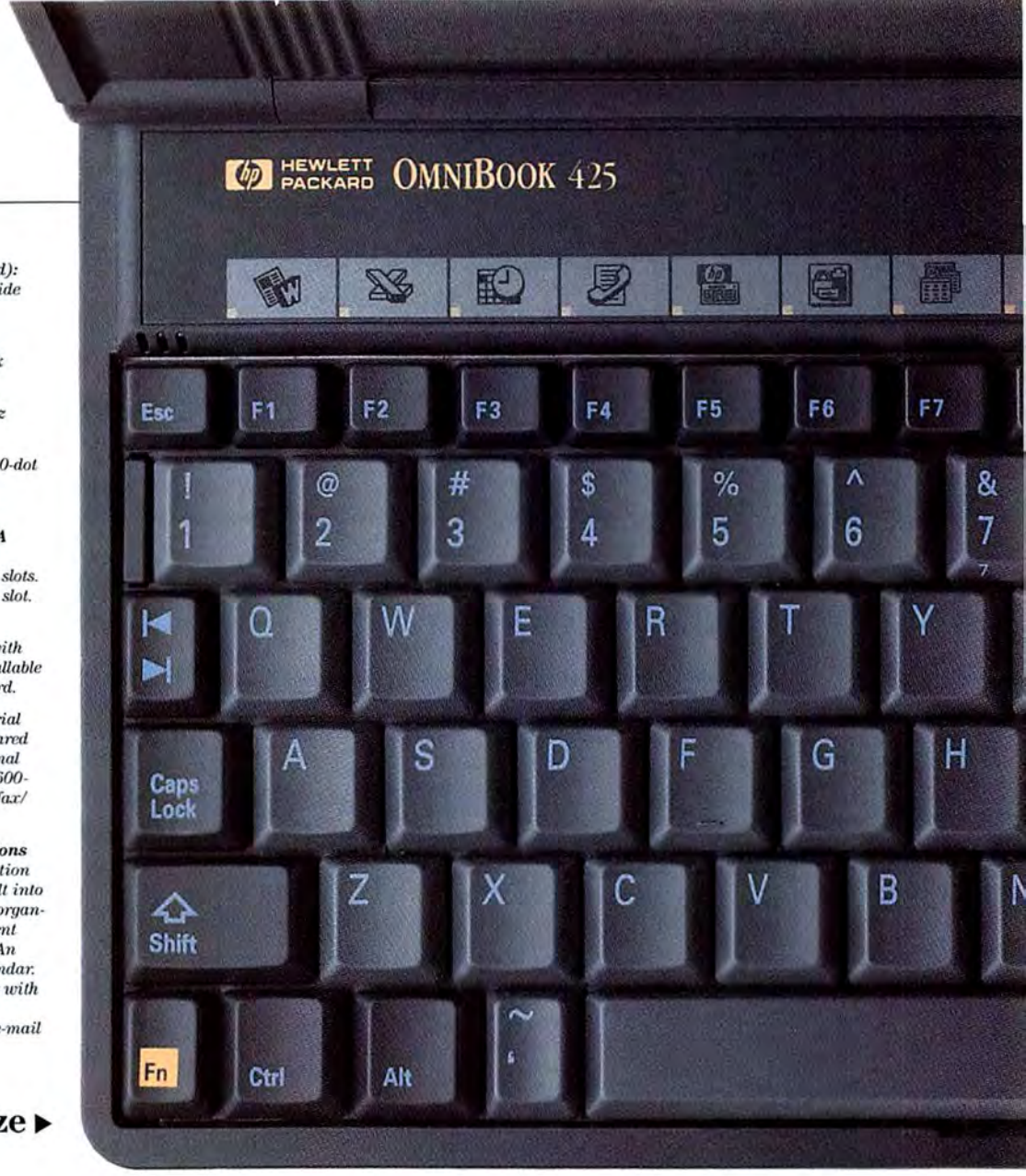
In Canada, call 1-800-461-3327.

Borland

Power made easy™

Copyright © 1993 Borland International, Inc. All rights reserved. All Borland product names are trademarks of Borland International, Inc. Offer good in the United States and Canada only. All prices in U.S. dollars. Dealer prices may vary. *Including Borland's InterBase,™ SYBASE/Microsoft SQL, and ORACLE servers. †Novell Message Handling Service (MHS and NGM); MCI Mail; cc:Mail; Windows for Workgroups, MS-Mail, and other MAPI-compliant messaging services; Local Area Network (LAN) systems, such as Novell NetWare, Banyan, IBM® LAN Server, MS-LAN Manager, AT&T StarGROUP, and other peer-to-peer networks. BI 5815

Circle 63 on reader service card



***Dimensions** (closed): 1.4″ high x 11.1″ wide x 6.4″ deep.*

***Weight:** Less than 3 pounds; flash disk model lighter.*

***Processor:** 25-MHz 486SLC/e CPU.*

***Display:** 640- x 480-dot VGA; 9-inch LCD; 16-level grayscale.*

***Available PCMCIA Type II slots:** Flash disk model: 2 slots. Hard disk model: 1 slot.*

***RAM:** 2 MB expandable with optional, user-installable RAM expansion card.*

***I/O:** 115K-baud serial RS-232, serial infrared and parallel. Optional 2400-baud data; 9600-baud send/receive fax/modem.*

***Built-in applications and more:** In addition to applications built into ROM, it is also an organizer. An appointment and address book. An alarm clock. A calendar. A calculator. A link with the office PC. With options, a fax and e-mail terminal.*

Actual size ▸

Now, 486 technology

The new HP OmniBook 425 PC is the best thing going for people who travel on business. Because it's the lightest full-function PC with a full-size keyboard. And it's loaded with all the features busy travelers need to take with them.

We trimmed the weight (less than 3 pounds). But not the full-size keyboard. Measuring a sleek 1.4″ x 11.1″ x 6.4″, the HP OmniBook 425 won't slow business travelers down. And their fingers can move across those familiar keys just as fast as on their office PC. Because the keys are the same size.

With 8 hours of battery life, travelers can keep on going. That's continuous use of the flash disk model. And the battery pack recharges in less than 1½ hours. Or drop in four AA batteries. Even the hard disk model lasts 4½ hours between charges.

Microsoft® applications, built into ROM. Being built into ROM makes all the difference. It means Microsoft Word, Excel and Windows 3.1 come up instantly on the 9″ LCD screen. No disk space is wasted. No time lost booting. Or going in and out of applications. Instead, hit one function key and you're in business with your next application.

Built-in mouse saves space, works anywhere. Press a button. Out comes the mouse. It's not a ball or a stick. There's nothing extra to connect. It's a genuine mouse. And it pops up to make it as easy to handle as the ones people are used to working with. Which helps make working on the road as productive as in the office.

It turns on instantly in the same place it's turned off. Although this superportable turns completely off to save battery life, it keeps track of the last screen. And that's where it turns on again. It doesn't even have to boot up.

*Suggested U.S. list prices. †For Canadian dealers, call 1-800-387-3867. Microsoft and MS-DOS are U.S. registered trademarks and Windows is a U.S. trademark of Microsoft, Inc. ©1993 Hewlett-Packard PG12309A

"The OmniBook will become the truly hip walk-around computer of choice."
— *Jim Seymour, Columnist – PC Week, PC Magazine*

"Now HP stands for hot products."
— *Business Week*

PC Computing MVP 93 FINALIST

is really going places.

The price to lighten your workload? The HP OmniBook 425 is just $2,125 for the hard disk model; $2,375 for the flash disk model.* The HP OmniBook 300, with a 386 chip, is $1,600 for the hard disk model; $1,850 for the flash disk model.*

For more information call 1-800-443-1254, Ext. 159. It's going to make a lot of workloads lighter. Including yours.

HP OmniBook.
Personal Convenience. Personal Power.

HEWLETT® PACKARD

MediaMagic™.

The Trick to Mastering Multimedia.

A family of audio boards that perform like magic.

There's a trick to getting the most from multimedia. It's MediaMagic™. Our full-family of audio boards and sound systems deliver high-quality sound and outperform the competition without their high price or difficult installation.

Introducing the ISP-16 Audio Board. $99

When multimedia is more than a game.

The ISP-16 is big news for cost-conscious users. At just $99, you can buy two boards for the price of one Sound Blaster 16. And the features are identical. Both have 16-bit stereo sound, record and playback, 20-voice FM synthesis and CD-ROM interface. But only our ISP-16 supports popular Sony CD-ROM drives. Get our professional quality ISP-16 for a game-board price. Or upgrade to the ISP-16 Sound System, complete with CD-ROM drive, custom speakers and popular CD-ROM titles for hundreds less than our competition.

Enhance your multimedia experience with DSP-16 — For affordable, high-performance sound.

MediaMagic Digital Signal Processor (DSP) boards offer quality digital audio at affordable prices. You get 16-bit, 48kHz stereo, a CD-ROM interface and a joystick/MIDI port all in one package. Unlike other boards, the DSP-16 is compatible with AdLib, Sound Blaster, Business Audio, Windows Sound System and MPC-2. DSP-16 will also support future audio standards with a simple software upgrade while other boards just become obsolete.

DSP-16 SCSI and DSP-16 Plus – The ultimate in multimedia sound.

MediaMagic DSP-16 SCSI and DSP-16 Plus Audio Boards have all the features of the DSP-16 and more! Choose the DSP-16 Plus for MPEG II real-time data compression and WaveMagic, the wavetable MIDI synthesis professional musicians use. Or choose the affordable DSP-16 SCSI, and upgrade to WaveMagic with MPEG II later!

Products:	Digital Audio	Upgrades	Wave Table	CD ROM	Real-Time MPEG Audio	Price*
MediaMagic™ DSP-16 Plus	16-bit 48 Khz	Yes	Standard	SCSI	Yes (encode/decode)	$259.00
Sound Blaster 16 ASP	16-bit 44 Khz	Yes	Expensive Upgrade	Proprietary	No	$349.95
ProAudio Spectrum-16	16-bit 44 Khz	No	No	SCSI	No	$299.00

*Base SRP

MediaMagic Sound Systems — The complete multimedia solution.

We've combined our powerful MediaMagic audio boards with Sony and Toshiba CD-ROM drives, high-quality stereo speakers and popular CD-ROM titles for turnkey multimedia solutions that are powerful, affordable and easy to use.

Trade-up today and get up to $50 Cash Back

It pays to upgrade your system! Purchase one of our DSP audio boards, send us your old 8-bit board by January 31, 1994 and receive up to $50 cash back.

Price. Performance. Upgradeable. And a generous trade-up program. When multimedia sounds too good to be true, it's no trick. It's MediaMagic™ For your nearest dealer, or for more information, call:

800-624-8654

MEDIA MAGIC™

USA: MediaMagic, a division of Austin Computer Systems, 10300 Metric Blvd., Austin, Texas 78758 Tel: 800-624-8654 Fax: 512-454-1357. International: IPC Corporation LTD. 23 Tai Seng Drive. Singapore 1953 Tel: 65-744-2688 Fax: 65-287-6806.

© 1993 MediaMagic, a division of Austin Computer Systems. All rights reserved. MediaMagic is a trademark of IPC Corporation LTD. All other company names and products are trademarks or registered trademarks of their respective owners. Specifications subject to change without notice.

Circle 22 on reader service card

The Data Access Dance

It's a common paradox: Your business has spent a small fortune on sophisticated technology for storing and retrieving information. But the system is too complicated for people to use, so they revert to looking things up in binders and knocking on doors. This month John Meyer, a departmental administrator for the San Francisco–based law firm Carr, McClellan, Ingersoll, Thompson & Horn, describes how his company found a cost-effective, convenient way to quickly access the information they needed from their corporate database. —*Ed.*

John Meyer is a departmental administrator for a San Francisco law firm.

Client, Client, Who's Got the Client?

Ever tried to get information from a corporate database? If you have, you know it's usually more trouble than it's worth. First, you have to persuade the information systems (IS) watchdogs, whose job is to keep corporate information intact and secure, to let go of the data. Then you have to wrestle it into a readable format on your desktop computer.

All of our 120 employees have PCs that are connected to one of four network servers that run DOS versions of WordPerfect, Quattro Pro, dBASE, and Paradox and several custom legal applications. The desktop PCs are also linked to an IBM AS/400 minicomputer that houses all the relevant information about our clients (names and addresses, account status, account manager, and so forth) in two different databases—a customer contact database and an accounting database. Each consists of about 30,000 records.

In spite of this wealth of hardware and software, we had no simple way to perform one of the most common tasks of any business: looking up clients by name. When a client called with a question, we had to make him or her wait—sometimes for hours—while we struggled to find information about the account. First, we had to locate the client's account number on a huge computer printout stored in a three-ring binder. Then we used a terminal emulation program to log on to the AS/400, waited 5 minutes to get into the client database, entered the client number, and waited some more for the correct information to appear on screen. Half the time our PCs froze, since the terminal emulation program took up a huge chunk of their memory. When that happened, we had to reboot and start all over. By the end of the day, the stress level was palpable.

Exasperated users began taking matters into their own hands by typing lists of client information in individual WordPerfect files stored on the servers. As a result, several rogue client lists began to circulate, many introducing misspellings of client names and other errors. In addition, people were spending a lot of valuable time entering and updating data in these incomplete, renegade lists.

In an effort to remedy the situation, the network administrator began saving versions of the corporate database—listing only client name and account number—in read-only text format to the servers. That way, we could at least find the client numbers using WordPerfect's search functions, although it was still time-consuming. We also still had to struggle with the AS/400 system to get more detailed information.

The E-Mail Surprise

This nerve-racking situation went on until 1992, when management decided to purchase an E-mail system.

In searching for an E-mail package, we discovered Futurus Team, a terminate-and-stay-resident (TSR) program that uses only 12.5K of memory. You can activate it with a keystroke, even if another program is also in memory. And—the surprise—Team came with a utility that enabled us to browse dBASE-compatible files without having to load the database program.

Once we had something our PCs could work with, the IS folks needed to translate the files from the AS/400 database into dBASE format. To do this, they copied the corporate database from the AS/400 to an ASCII-delimited text file. Next, they imported the text file into Paradox, then exported the files from there as dBASE III+ files, which could be read directly by Team. (To ensure that our PC records are up-to-date, IS downloads the database file from the AS/400 into Paradox each night as part of the backup procedure.)

Today our firm keeps a read-only copy of the database where everyone can access it—in the Team directory on

EDWARD CALDWELL

MONDO MONITOR®

MAG INNOVISION

Delmer knew she was the kind of woman he could settle down with. The one he'd been searching for to make beautiful images together.

(Louise had completely mesmerized Delmer with her big 17" MAG monitor smile.)

SUBMITTED BY NICK PETERS, A PROUD NEW OWNER OF A MX15F IN WICHITA, KS.

WIN A MAG MX15F MONITOR. SEND YOUR CARTOON IDEAS WITH RETURN ADDRESS AND TELEPHONE NUMBER TO MAG INNOVISION AT 2801 SOUTH YALE STREET, SANTA ANA, CA 92704, 800-827-3998, 714-751-2008 (IN CA), FAX: 714-751-5522. IF YOUR ENTRY IS SELECTED, YOU WILL RECEIVE A MAG MX15F MONITOR. ALL IDEAS SUBMITTED BECOME THE PROPERTY OF MAG INNOVISION.

Circle 151 on reader service card

NORDICFLEX Gold®

ADVANCED DESIGN FOR A SUPERIOR WORKOUT

The NordicFlex Gold® strength trainer advances the science of strength training to bring you truly revolutionary results.

GET A FAST WORKOUT, FAST RESULTS.

NordicFlex Gold has a patented isokinetic resistance mechanism that automatically adjusts to the amount of force you apply. According to research, with isokinetic resistance:

- You build lean muscle more effectively than with rubber band systems or free weights.
- You spend less time between exercises than with other systems.

And the ergonomically correct linear exercise motion isolates the muscle groups you want to build for maximum results.

Patented Isokinetic Mechanism

Plus, the NordicFlex® World Class™ Edition offers additional features to enhance your workout, including the electronic performance monitor.

FREE Video and Brochure

Call 1-800-441-7890 Ext. 6FDA4

or write: NordicTrack, Dept. 6FDA4
104 Peavey Road, Chaska, MN 55318-2355

❑ Send me a FREE brochure ❑ Also a FREE VHS videotape

Name _____
Street _____
City _____ State ____ Zip _____
Phone ( ) _____

30-day in-home trial

Best of all...it's from NordicTrack!

©1994 NordicTrack, Inc., A CML Company
All rights reserved.

Circle 64 on reader service card

the servers. When someone signs onto the network, he or she is automatically connected to Team. If the user presses a hot key (<Ctrl>-C, for example, to access the client name) and enters a client's name, Team jumps to the appropriate record in a fraction of the time it took to look up the name in WordPerfect. Not only that, the information is consistent and doesn't spread errors like the rogue lists did.

This system not only gives instant access to the client's account number but lets us locate other useful information, such as account status, date and amount of the client's last payment, and so on. Then we can jump back to the application we were working in by pressing <Esc>. And a bonus we weren't even looking for: All we have to do is hit a function key to export the client's name and address to a document to print letters and addresses from the database. No one's system hangs or crashes while getting into the database. And because the Team index jumps to exactly the right spot in the database, no one wastes time searching for client information.

Although the TSR doesn't let us access the database under Windows, our smattering of Windows users aren't left out in the cold. Asymetrix's ToolBook, which we use to build HyperCard-like applications, has a similar data feature. Using Asymetrix's runtime license, we've been able to distribute the ToolBook application without having to purchase additional copies, and every one of our Windows converts enjoys the same access to the database as the DOS users.

Unfortunately, there's a not-so-happy ending to this story. While the DOS version of Team has been invaluable in solving our problem, Futurus is putting more of its development effort into its Windows version, which is not as much to our liking. So we're looking into other products, such as WordPerfect Office, which includes E-mail and provides access to our database through its built-in Notebook tool. Meanwhile, we intend to hang on to the DOS version of Team, since it gives us just what we want.

Edited by Bronwyn Fryer

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

Windows at your fingertips

200MB HD
INTEL486SX
SL ENHANCED!

PC MAGAZINE

"Scoring high in overall value and design, the Micro Electronic's WinBook gives you a lot for your money, including an outstanding integral trackball."

PC MAGAZINE, Portable Computing Issue, August, 1993

The WinBook™ by Micro Electronics™ gives you the power to run Windows and a unique, ergonomic design to make it easier to use.

It features a built-in, centered trackball which allows you to control cursor movements effortlessly without having to lift a single finger off the keyboard. Full-size keys and a sloping hand rest let you work in total comfort.

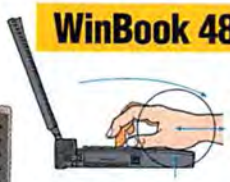
Upgradable to 32MB RAM, the new fully-static design SL enhanced Intel486SX 25MHz chip enables the CPU to operate at a 0MHz low power state. Plus, we have fine-tuned the WinBook's screen. In monochrome and in dual-scan STN color—you get sharper, clearer images with less cursor loss.

The WinBook was engineered for Micro Electronics, a division of MEI/Micro Center, Inc. MEI is America's leading direct source for computer products. Micro Center has been selling PCs for more than 14 years—longer than IBM or Compaq—with over 736,000 units sold. With over 2.2 million satisfied customers nationwide, we have developed a superior support staff including top engineers and technical specialists. So you always get the highest quality product at the lowest possible price.

Dual-button trackball centered under the keyboard

WinBook™

WinBook 486 SX SL Enhanced Features



Ergonomically engineered

The WinBook's ergonomic features include a sloping hand rest and keyboard, plus a centered dual-button trackball—allowing you to work in total comfort away from your desk.

Clean, sharp color display

The WinBook's advanced, dual-scan color display gives you 99% shadow-free performance compared to other single-scan passive matrix displays. You get near active matrix quality at a passive matrix price!

The 5.4 lb. WinBook, designed by award-winning Palo Alto Design

- Includes a 9600 baud send 4800 baud receive fax/2400 baud modem.
- Fast-acting, LCD screen for less cursor loss.
- Industry-standard PCMCIA 2.0 slot for future expandability.
- 512k video RAM.

Mouse/keyboard, parallel, serial & VGA ports plus PCMCIA expansion

Docking station gives you desktop power

With the available docking station, your WinBook instantly becomes a full-function desktop computer. The two expansion slots and drive bays allow you to add peripherals such as monitors, hard drives, CD ROMs, I/O cards or an extended keyboard. It also includes parallel, serial, PS/2 mouse, external keyboard and VGA ports. **And it's just $399!**

Longer battery life

The WinBook features NiMH 2200 MA batteries with gold-plated contacts. This allows it to run much longer than units with traditional NiCAD batteries—and there's no memory effect.

NEW! Intel486 SX SL Enhanced

intel inside

Color capable printing from HP and WinBook

HEWLETT PACKARD

$289

The color capable HP DeskJet 310 uses the same inkjet technology as full-size DeskJet models and weighs only 4.3 lbs. Get professional quality 300 dpi output anywhere you need it. Add an optional color kit at a special low price and you have full color printing capabilities!

Monochrome	Dual-Scan Color
$1599	$2399
4MB RAM 200MB HDD	4MB RAM 200MB HDD
• SL Enhanced Intel 486 SX 25MHz	• DOS & Windows • Fax modem included!

Your satisfaction is unconditionally guaranteed for 30 days from date of purchase. If for any reason whatsoever you are not satisfied with your purchase from us, we want you to return it. We will be glad to repair the product or give you your money back.

Service, warranty and support

- 72-hour service turnaround guarantee.
- 30-day unconditional money-back guarantee.
- 24-hour burn-in protection.
- One-year limited warranty on parts and labor.
- Toll-free technical support for the life of the computer.

Convenient payment options

Use your MasterCard, VISA, Discover Card, personal check or P.O. with credit approval.

MasterCard VISA DISCOVER

Thank you for your order!

Micro Electronics
a division of MEI/Micro Center, Inc.

Specifications

Size/Weight
- 11" X 8 3/4" X 1 3/4"
- 5.4 lbs. with battery (monochrome)
- 5.9 lbs. with battery (dual-scan color)

Pointing Device
- 16mm Alps dual-action, Microsoft- compatible trackball

Battery
- Up to 3 hours with power management, over 5 hours with auxiliary battery (less 30 minutes for color)
- NiMH (no memory effect)
- 2200 MA with gold-plated contacts
- Worldwide auto-sensing AC adapter
- Quick 1.5-hour recharge

Processor and Memory
- SL enhanced Intel486 SX 25MHz CPU
- 4MB RAM (upgradable to 32MB)
- Pico Power Evergreen HV chipset
- 8k internal cache

Drives
- One built-in 1.44MB 3.5" floppy drive
- Monochrome: Internal 200MB (16ms) hard drive
- Color: Internal 200MB (16ms) hard drive

Software
- Comes loaded with MS-DOS 6.0 and Microsoft Windows 3.1

Display
- Super-twisted 64 gray-scale, 10" LCD and 1024 x 768 for external monitor with 512k video RAM
- Optional dual-scan STN color display
- Adjustable contrast and brightness
- Visible LED indicator on cover-down

Keyboard
- Full-function keyboard with 85 keys and 4 inverted-T cursor control keys. 3.0mm keyboard spacing

Modem
- Fax-9600 baud send/ 4800 baud receive/2400 baud modem

I/O Ports
- PS/2 mouse interface/AT keyboard interface
- PCMCIA 2.0 slot
- Serial: 9-pin connector
- Parallel port
- Video: 15-pin connector for CRT
- 160-pin docking station
- Auxiliary battery port

Options
- 486 DX 33MHz CPU on selected models
- Docking station

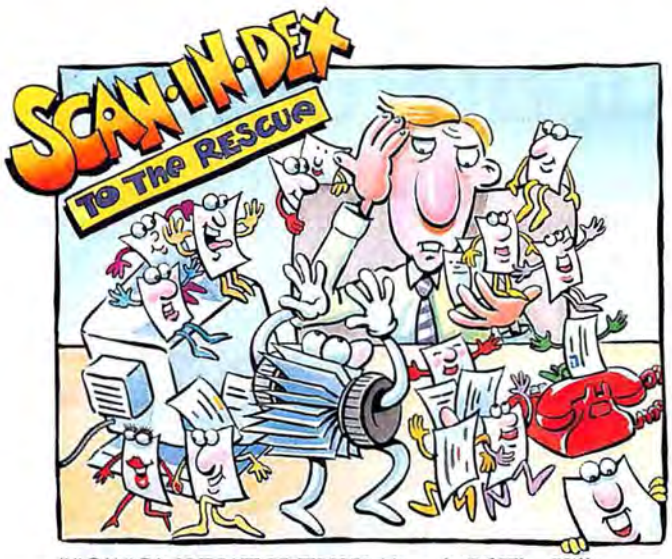
30-day, unconditional money-back guarantee

Call 1-800-468-1037 to order today!

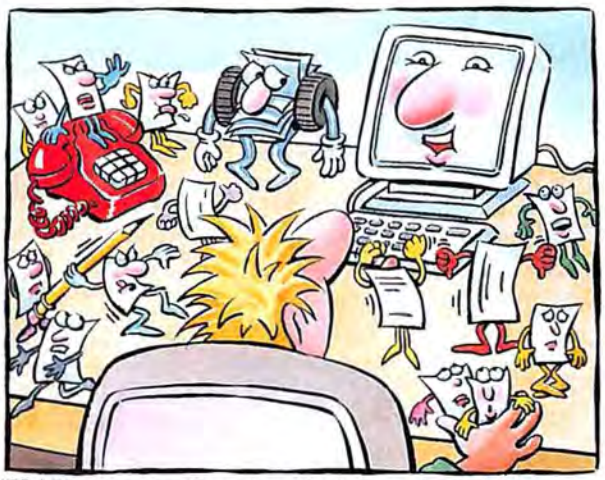
Monday-Friday, 8am-9pm EST • Saturday, 9am-4pm
1160 Steelwood Rd., Columbus, OH 43212 • FAX: 1-800-448-0308

© 1993 MEI/Micro Center, Inc. All rights reserved. Micro Center is a registered trademark of Micro Electronics, Inc. MEI is a registered trademark and Micro Electronics and WinBook are trademarks of MEI/Micro Center, Inc. All other trademarks and registered trademarks are property of their respective corporations.

Circle 165 on reader service card

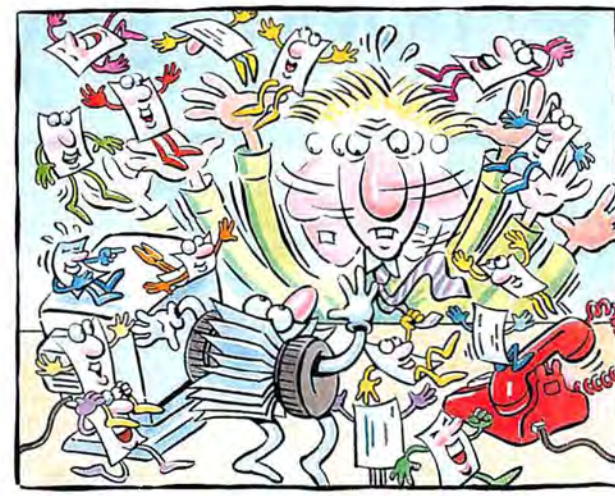


"#@!*#@!, WHAT IS THIS? 'Attack Of The Killer Business Cards'? They're everywhere ... and they're breeding. They multiply faster than my accountant!"

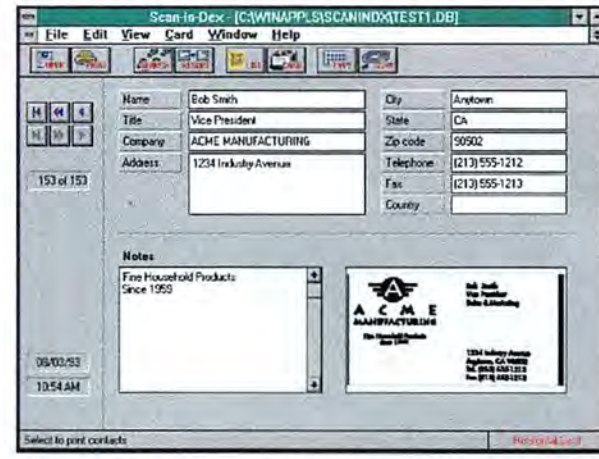


"Yo! Hey genius. Reee-lax. We know what's driving you looney, because it was driving us crazy too. That's why Microtek came up with the ***Scan-in-Dex*** ... Check it out." ☞

Thanks to ***Scan-in-Dex***, no more business card clutter. Just an automatic, low cost way to organize business card information into your computer. Now Bill has it all together. Cool, calm and in touch, (well, sort of cool??).



"They're attacking from all sides ...business cards, card files ... t-t-taking over!! ARGH, I'm losing it! Paper shredder ... yeah, that's the ticket, shred 'em, go for the kill. What a nightmare! HELLLLLLLLLP!"



"***Scan-in-Dex***, scans, reads and records business card information in an electronic address book in seconds! Then you can print, search, or export the information. So what do you think Bub? Is this a solution to a problem or what?!"

Scan-in-Dex solves the business card dilemma by eliminating the need for cumbersome card files. For the first time, accessing business contacts from a computer is a realistic option for busy people, because it requires minimal typing. Scan-in-Dex comes to you from Microtek, the leader in affordable desktop scanning for over a decade. For more information on Scan-in-Dex or the name of your nearest Microtek retailer call, 1-800-654-4160.

MICROTEK
Better Images Through Innovation.

©1993 Microtek Lab, Inc. 680 Knox Street, Torrance, CA 90502. Microtek is a registered trademark of Microtek Lab, Inc.
All other trademarks whether registered or not are the property of their respective holders.

Circle 195 on reader service card

The PowerPC Walks, Talks, and Acts Like a PC, but Is It a PC?

When is a PC not a PC, even when it's called a PC? The answer: When it's a PowerPC, because the PowerPC chip is most likely to be used not in Windows systems but in Mac and UNIX boxes.

Still, read on: If you're concerned about the power that the Microsoft-Intel combine wields over personal computing, the PowerPC is your best hope of breaking it. And with UNIX becoming increasingly important to many corporate customers, a PowerPC is a logical choice for servers.

Most important: Should you care about a PC chip that really isn't one? If all you're interested in is running Windows on a desktop, probably not. Microsoft has already sent the smoke signals indicating that Windows 4.0 (code-named Chicago) won't run on anything but a system based on an Intel original or compatible chip.

Windows NT, however, could end up running on a PowerPC, and Macintosh and UNIX users are being whipped into a frenzy by the prospect of low-cost power, fed by Motorola's promise that the first chip—the 601—is just the beginning. Future chips, even more powerful, will be designed for portables, high-end desktops, and servers. All, we're told, will be less expensive and more powerful than their "Intel Inside" counterparts.

For Apple and Motorola, the PowerPC replaces the 680-series chips used in the Macintosh since its invention. The goal is to give Apple customers Pentium-grade power plus Mac ease of use for the same or less money than they'd pay for an Intel-based machine.

Although IBM has put the PowerPC to work in UNIX boxes, the company has longer-term plans for the chip as well. It plays a key role in Big Blue's plans for the Workplace OS, the operating system that's supposed to replace OS/2 over the next few years. IBM's Pink operating system (also being co-developed with Apple) is related to Workplace OS and is expected to compete with Microsoft's Cairo, the next version of NT. But Cairo is years away.

So let's return to the spring of 1994. By then, the first PowerPC, the 601, will have appeared in both IBM UNIX systems and high-powered Macs selling for $2500 to $5000.

$2500 PowerPC Systems in 1994

Software performance is the key to the success of both the Pentium and the PowerPC. While they will run today's Windows and Macintosh applications, you won't see the true benefit of their architectures until specially written applications appear. In the case of the PowerPC, it's clear that those applications will arrive. But I still haven't seen any special software releases for the Pentium.

What is clear is that the PowerPC won't be any slower than the Pentium. Also, the first PowerPC-based machines should cost less than comparable Pentiums, and Motorola is signaling analysts that this price advantage will persist. That's probably true—up to the moment Intel decides the PowerPC has taken enough of Intel's share. Even then, Intel will react cautiously, because dropping prices on the Pentium means dropping prices on every other Intel processor.

For that reason, the PowerPC should offer a price/performance advantage. It should also provide a clear path to the object-oriented operating systems that will emerge in the latter half of the decade.

The keys to the success of the PowerPC are only partially in the hands of Motorola, IBM, Apple, or even their customers. The degree to which Microsoft and network giant Novell shun or embrace the chip will be the major factor determining whether a PowerPC ends up on your desktop.

Contributing Editor David Coursey edits P.C. Letter. *He can be reached on PC World Online (see page 12 for contact information).*

LOOKING AHEAD

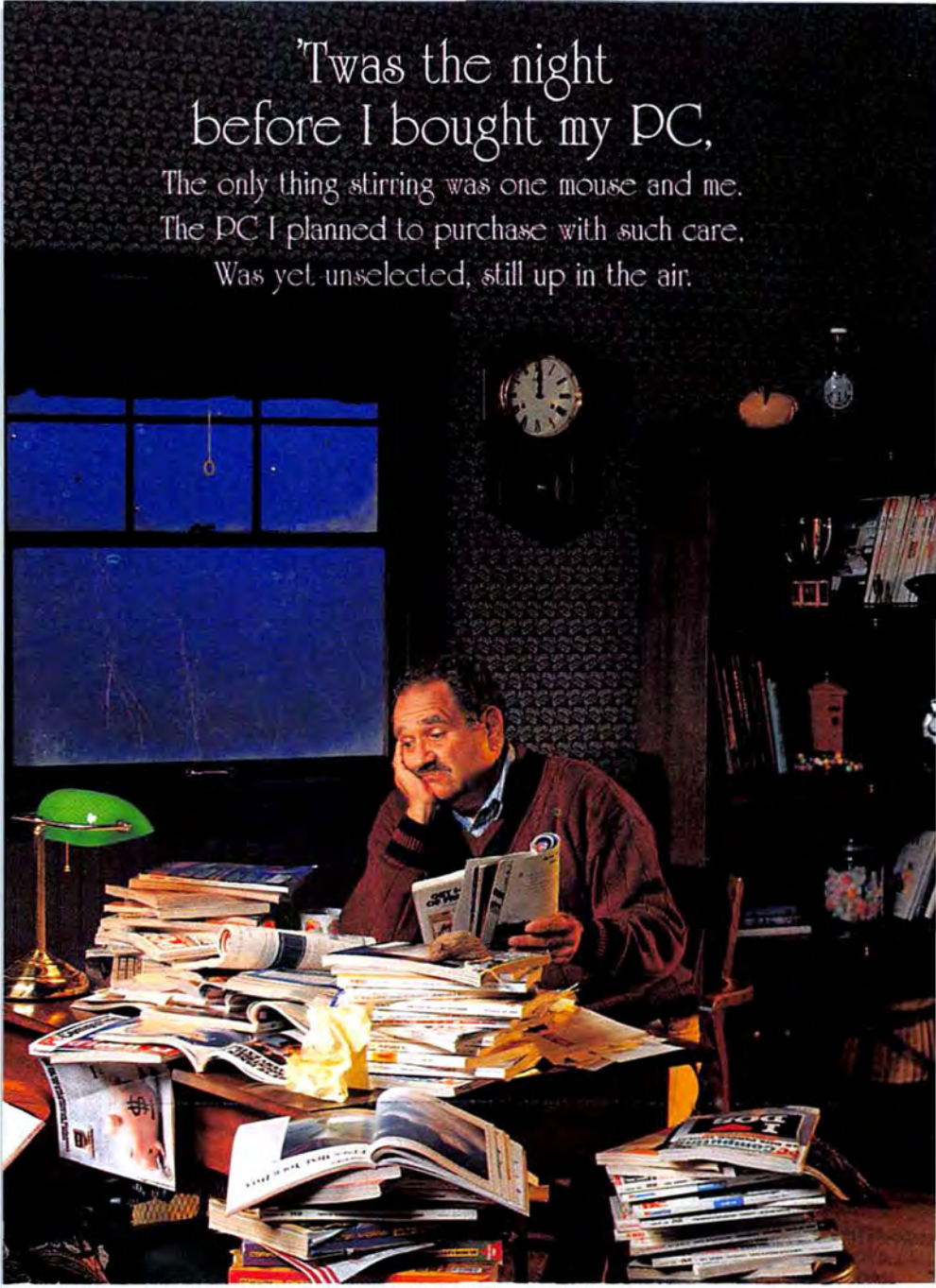
Motorola won't be alone in challenging Intel's dominance in 1994. Intel is making too much money to go unchallenged, even with its deserved reputation for suing first and asking questions later. Look for a Pentium-class CPU next year and remember, Intel avoided using the name 586 because it couldn't protect it with a trademark. If I named the vendor, I'd have to shred you . . . Expect Apple to continue to work very hard at cracking the Windows market by using printers and multimedia as leverage; both are areas where Apple can teach PC vendors a thing or two. However, the company's attempt to merge the Windows and Macintosh interfaces (see Top of the News, page 71) is too underpowered to make Windows users happy . . . Microsoft and Lotus are upset that—imagine this—businesses are buying suites and splitting the applications among several users. Rather than sue over the license violation, the software giants will either cave in or make the packages impossible to separate. Which scenario you think will happen depends on how cynical you are.

By David Coursey

MICHELE CLEMENT

'Twas the night before I bought my PC,

The only thing stirring was one mouse and me.
The PC I planned to purchase with such care,
Was yet unselected, still up in the air.



This business of buying the perfect PC
Was more difficult than I thought it would be.
While visions of failure loomed dark in my head,
My eyelids grew heavy as if they were lead.
I may have been dreaming, but how can I tell?
My memory recorded what happened so well.
Then out on the lawn there arose such a clatter,
I sprang from my desk to see what was the matter.
I saw the strange craft and I let out some "Wows,"
It's not often you see a red sleigh drawn by cows.
For a second I swore that my eyes played a trick.
The driver was Santa Cow, not old St. Nick!
She brought with her toys for broadening minds,
Gateway 2000™ PCs of all kinds.
I remembered that name — "Gateway values," I read,
"Are the best in the industry," editors said.
"Gateway's prices, quality, and service," they wrote,
"Are udderly wonderful. They get our vote."

1992 & 1993

Best Service 1993

Best Service

800-846-2065

MICROSOFT
WINDOWS
Version 3.1
HANDBOOK

Santa Cow didn't speak, but went straight to her work,
Pulling PCs like magic from her bag with a jerk.
Then, what to my wondering eyes should appear,
But a miniature PC called the HandBook, I hear.
With VGA screen and performance so quick,
I knew at a glance 'twas a 486.
So how could they make a
computer this small?
The whole package weighs less
than three pounds in all!
This little gem would be perfect
for me,
Working hither and yon as I'm oft apt to be.
The HandBook would be a most marvelous gift,
But there are more choices to ponder and sift.

HandBook® 486

- Revolutionary size
- Intel® SL-Enhanced 486 CPU
- Backlit VGA screen
- Great power management
- Touch-type keyboard
- EZ Point™ integrated pointer
- Prices start at just **$1,495!**

intel inside

GATEWAY2000

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

800-846-2065

MICROSOFT
WINDOWS

At once I set eyes on another delight,
Its screen was a bouquet of colors so bright.
'Twas the 486 ColorBook under the tree,
Same price as mono from another company.
Performance and color at such a good price,
Is there something here that will
barely suffice?
It's light and still small, has a
built-in trackball,
With the ColorBook you really
can have it all!
I started to see that with all
Gateway's wares,
Although it sounds corny, there somebody cares!
You get honest value for your hard-earned buck,
Compared to them I find the other brands ...
Well, they're just not as good.

ColorBook™

- Brilliant color at mono price
- Intel SL-Enhanced 486 CPU
- Great battery life
- Removable hard drive
- Compact size, 5.7 lbs.
- Integrated trackball
- Prices start at only **$1,995!**

intel inside

GATEWAY2000
"You've got a friend in the business."®

800-846-2065

GATEWAY2000
GATEWAY2000

Santa Cow was still busy unwrapping PCs.
The next one she opened was sure to appease
A person who's searching for power for less.
Mini desktops from Gateway are simply the best.
These systems' performance is tops in their class.
Just study the benchmarks,
these mini's kick ___.
A whole lotta MIPS here for
not that much money.
This deal would be easy to sell
to my honey.
With local bus also the video
is fleet.
Add software to boot and the system's complete.
When it's said that small packages hold the best things,
It refers to the mini's that Santa Cow brings!

Mini Desktop Systems

- Outstanding price/performance
- Local bus video
- Small footprint case
- Upgradable & expandable
- Large, fast hard drive
- Energy Star "Green" PC
- Prices start at only **$1,275!**

intel inside

GATEWAY2000

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

800-846-2065

GATEWAY 2000
GATEWAY 2000

Behold! What's this? More systems to view?
Santa Cow showed another with a trumpeting moo.
I sneaked a close look out from under a table.
4DX2-66V was the label.
I recognized this "Big Kahuna"
machine.
The one that the editors said
would just scream.
It won all the honors, near
countless awards.
These VESA PCs hold most
proud motherboards.
I ruled out this kind of performance for us.
Too costly, I reasoned, for VESA local bus.
But look at that price, I was certainly wrong.
With Gateway I can have that for which I long.

VESA® Systems

- Exciting video performance
- Non-proprietary VESA local bus
- Compact but roomy desktop case
- Upgradable & expandable
- Large, fast hard drive
- Energy Star "Green" PC
- Prices start at just **$1,495!**

intel inside®

GATEWAY2000

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

800-846-2065

GATEWAY2000

"Oh no! Santa's gone!" I heard someone exclaim.
'Twas me, I discovered, no other to blame.
Then I saw where she was, in the kitchen she sat,
Santa Cow having cookies and milk with the cat.
In the doorway I found one
more fabulous thing,
In all of PC-dom, the system
that's king.
A Pentium tower with PCI bus.
This system is certainly worth all
the fuss.
With oodles of RAM and a big
dose of cache.
The P5-60 is the way to be brash.
I've so many choices, now what have I missed?
How 'bout a Gateway for each on my list!

Pentium™ Systems

- Intel's latest 64-bit CPU
- Outstanding video performance
- Extremely fast PCI local bus
- Expandable tower case
- Giant, fast hard drive
- Double-speed CD-ROM
- Prices start at only **$2,995!**

intel inside
pentium
PROCESSOR

GATEWAY2000
"You've got a friend in the business."®

800-846-2065

Like icing on top of a
wonderful cake.
The Cow filled the stockings with
goodies that make
A PC productive and more
fun to use.
Peripherals keep you from
singing the blues.
The software was Santa Cow's
pièce de résistance.
With titles from Gateway I'd
placate all wants.
Each Gateway PC comes with
software installed.
More options than anywhere
else that I called.

Application Software

Gateway systems now come with Microsoft MS-DOS 6.2 and Windows for Workgroups 3.11. Workgroups does everything Windows 3.1 does, plus it lets you easily set up a network. Another Gateway value for you at no extra charge! If a system configuration includes "choice of application software," choose one of the following packages:

Microsoft® Excel for Windows™
Microsoft Word for Windows™
Microsoft Word and Bookshelf '92,® CD-ROM Edition
Microsoft PowerPoint for Windows™
Microsoft Project for Windows™
Microsoft Access™ for Windows
The MS Entrepreneur Pack (Works,™ Publisher,™ Money,™ and games)
Borland Paradox® database and Quattro® Pro for Windows spreadsheet

Application Software Upgrades

Upgrade from a choice of application software to Microsoft Office, CD-ROM version, for only **$99!** Ask us about this and other upgrades.

Communications

TelePath™ II Fax/Modem

Internal fax/modem, 14,400bps modem, V.32bis, with 14,400bps fax capability. Package includes Crosstalk™ for Windows, WinFax™ Lite, Qmodem and a CompuServe® trial membership. **$159**

Cardinal® 2400 Fax/Modem

Internal fax/modem, 2,400bps modem, V.22bis, with 9,600bps fax capability. Package includes Qmodem and WinFax Lite. **$49**

Intel EtherExpress™

A 16-bit Ethernet adapter from one of the world leaders in network adapters. **$105** Twisted Pair or BNC Kit (BNC Kit includes cable, connector, terminator and card)

Ethernet Adapter from 3Com®

Manufactured by 3Com for Gateway. Features parallel tasking architecture with a high level of integration. **$105** Twisted Pair. **$125** BNC Kit (includes cable, connector, terminator and card)

Colorado Memory Systems TBU

250MB internal automatic tape backup unit copies up to 9.5MB per minute with high-speed data compression. Comes with easy-to-use Windows and DOS software, one tape and cable. **$159**

Monitors

CrystalScan® 17-Inch Monitor

Non-interlaced color monitor, .26mm dot pitch. If your system comes with a 14-inch monitor, you can upgrade to this monitor for **$600**; from a 15-inch monitor, **$520**. (Prices good only for upgrades at the time of system purchase.)

Printers

Panasonic Color-Capable Printer

Add color to your documents with this 24-pin dot matrix printer. Includes Adobe Type Manager.® KX-P2123 Printer **$259**; Color Option **$50**

Epson® Stylus 800 Ink Jet Printer

Great laser quality at an even greater value. Measuring only 17 inches by 10.5 inches, the Stylus 800 has seven different typefaces and prints an extra-quiet 150 characters per second at 360dpi. Parallel cable included. **$289**

Epson ActionLaser 1500 Laser Printer

The ActionLaser delivers professional-quality printouts with crisp, sharp images, black blacks and smooth, "jag-free" lines. It also features a fast six-page per minute print speed, 14 resident fonts, 300 x 300dpi, and 1MB memory expandable to 5MB. Parallel cable included. **$669**

TI MicroLaser™ Pro 600

This Texas Instruments laser printer redefines value in high-performance printing with 6MB RAM standard, a fast eight pages per minute print rate, 500-sheet capacity and true 600dpi quality.

With 23 PostScript® Fonts: **$1,449**

With 65 PostScript Fonts: **$1,629**

The peripherals listed here are sold only with the purchase of a system. For details on our complete line of extras for Gateway customers, ask for our special add-on components division when you call.

GATEWAY2000

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

800-846-2065

Of course multimedia is all
the rage.
You've plenty to choose from to
move to that stage.
With sound cards and speakers
and fast CD-ROM,
There's stuff here to please any
Harry, Dick or Tom.

Multimedia

Multimedia Kit

Here's everything you need to add multimedia to your Gateway PC — at a great price!

- Gateway 2000™ 16-bit CD-quality sound card, compatible with Sound Blaster™ cards, with game port, stereo mic in, line in/out
- Double-speed CD-ROM drive, tray-loading, compatible with music CDs, multisession photo CDs and CD-ROM titles
- 2 Labtec® speakers
- Microsoft® Encarta Multimedia Encyclopedia
- Gateway System CD with Microsoft Multimedia Pack™

$299

For system configurations that include a CD-ROM drive: **$132**

Altec Lansing Speakers

Get superior stereo sound with these top-rated Altec Lansing ACS-300 speakers with separately powered subwoofer. **$219**

CD Software

Microsoft Encarta For Only $97

Where typical encyclopedias end, Microsoft Encarta begins. It brings learning to life with words, images, animation and sounds. With more than 25,000 articles, 17,000 multimedia elements, eight hours of sound, plus thousands of color photos, video clips, animation and illustrations, Encarta helps you learn about every subject from Aardvark to Zygote. Listen to over 350 music segments, hundreds of bird and animal sounds, over 100 readings by authors, and samples of more than 45 languages. Includes the complete text to the 29-volume 1992 Funk and Wagnall's New Encyclopedia. **$97 SPECIAL!** *Price good only through December 31, 1993.*

MECC Education Pack

MECC, one of the leaders in educational software, has bundled four of its most exciting programs, including: Oregon Trail — an exciting journey through the Old West; Money Works/Clock Works — teaches your child about money and time; Story Book Weaver — allows the child to create storybooks with pictures, words and sounds; and Super Munchers — a computer trivia game for the whole family. **$59**

Just Grandma and Me™

One of the most popular interactive animated stories for children on the market, Just Grandma and Me is packed with multimedia sound effects, music and animation. **$39**

Microsoft Dinosaurs

This program takes you back millions of years for a face-to-face encounter with dinosaurs. It's eye-opening education and awesome entertainment. **$55**

Microsoft BookShelf '93

The powerful interactive reference tool no PC should be without! Includes the Concise Columbia Encyclopedia, the American Heritage Dictionary, Roget's II Electronic Thesaurus, the World Almanac and Book of Facts 1993, Bartlett's Familiar Quotations, the Concise Columbia Dictionary of Quotations, and the Hammond Atlas. **$119**

The 7th Guest

The first interactive drama in a terrifyingly real virtual environment with real actors. The new standard in multimedia entertainment. The game's graphics are so real you'll think you're watching a movie. *(Caution — contains scenes of graphic violence.)* **$49**

Jazz: A Multimedia History

Travel on a musical journey with photos, video clips, sound effects, interviews and jazz music from 1923 to 1991. **$32**

The software listed here is sold only with the purchase of a system. For details on our complete line of extras for Gateway customers, ask for our special add-on components division when you call.

GATEWAY2000

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

800-846-2065

HANDBOOK® 486

- Weight: 2.94 Lbs.
- Dimensions: 9.75" x 5.9" x 1.6"
- SL Enhanced Intel® 486 Processor
- 4MB RAM (expands to 8MB or 20MB)
- 80 to 130MB IDE Hard Drive
- 7.9" Backlit VGA Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 1 PCMCIA Type II Slot
- EZ Point™ Integrated Pointer
- 78-Key Keyboard
- Parallel, Serial & PS/2 Ports
- MS-DOS,® Windows™ & Serial Transfer Cable

HANDBOOK 486SX-25

With 25MHz 486SX CPU and 80MB Hard Drive

$1495

HANDBOOK 486DX2-40

With 40MHz 486DX2 CPU and 130MB Hard Drive

$1995

HANDBOOK PACKS

Traveler's Packs:

- *New!* Microsoft Works for Windows, case, extra battery, alkaline battery pack & PCMCIA 96/24 fax/modem. **$369**
- *New!* Microsoft Works for Windows, case, extra battery, alkaline battery pack & PCMCIA TelePath™ fax/modem. **$489**

Presenter's Pack:

- PCMCIA VGA adapter, Asymetrix® Compel & case. **$319**

COLORBOOK™

- Weight: Under 5.7 Lbs.
- Dimensions: 11.7" x 8.5" x 1.77"
- SL Enhanced Intel® 486 Processor
- 4MB RAM (expands to 8, 12 or 20MB)
- 3.5" 1.44MB Diskette Drive
- Removable 80 to 260MB IDE Drive
- 9.4" VGA Dual-Scan STN Color Display
- NiMH Battery & AC Pack
- Suspend/Resume Feature
- 2 PCMCIA Type II Slots
- Integrated Trackball (2 buttons)
- 85-Key Keyboard
- Parallel, Serial & PS/2® Ports
- External VGA Port
- MS Works for Windows™
- MS-DOS and Windows

COLORBOOK 486SX-25

With 25MHz 486SX CPU and 80MB Hard Drive

$1995

COLORBOOK 486SX-33

With 33MHz 486SX CPU and 170MB Hard Drive

$2395

COLORBOOK 486DX-33

With 33MHz 486DX CPU and 260MB Hard Drive

$2795

COLORBOOK PACKS

Traveler's Packs:

- Case, extra battery & PCMCIA 96/24 fax/modem. **$329**
- Case, extra battery & PCMCIA TelePath fax/modem. **$449**

NOMAD 450DXC

- Weight: 6.2 Lbs.
- Dimensions: 8.5" x 11" x 2.2"
- 50MHz Intel 486DX2 Processor
- 8MB RAM
- 3.5" 1.44MB Diskette Drive
- 200MB IDE Hard Drive
- 8.4" **Color Active Matrix Screen**
- NiMH Battery & AC Pack
- Simultaneous Video with 1MB
- 79-Key Keyboard
- Microsoft® Ballpoint Mouse
- 9600/2400 Fax/Modem
- 1 Parallel, 1 Serial Port
- MS-DOS, Windows & Works for Windows™

$3995

OPTIONS

PCMCIA Cards:

- TelePath fax/modem — 14,400bps send-receive fax, 14,400bps modem. **$319**
- Fax/modem — 9,600bps send-receive fax with 2,400bps modem. **$199**
- Ethernet adapter. **$189**
- Token Ring adapter. **Call**
- HandBook VGA adapter. **$229**

Batteries:

- 2.2Ah NiMH batteries. **$89** each
- HandBook alkaline battery pack. **$29**

Diskette Drive:

- HandBook 3.5" 1.44MB external diskette drive. **$99**

Cases:

- Soft-sided black carrying cases custom-designed for ColorBook or HandBook. ColorBook **$49** HandBook **$55**

Extended VIP Warranty:

- We'll ship a replacement notebook within 24 hours during one-year warranty. Must be purchased at point of sale. Call for details. **$100**

4MB or 16MB RAM Upgrades:

- Due to the volatility of the DRAM market, please call for pricing.

Easy Payment Options

We make it easy for you to buy a Gateway PC, too! We accept most major credits cards and C.O.D. terms, with net 30-day terms and leasing options available to qualified commercial customers.

You can also apply for our new Gateway 2000™ DuoLine™ MasterCard® Card, issued by Dial National Bank, which lets you make purchases from Gateway and anywhere else MasterCard is accepted by giving you two lines of credit — one for Gateway purchases and one for all other purchases. For Gateway purchases, the card has no annual fee and a low variable interest rate of just 12.9% APR. For other transactions, you get a variable interest rate of 13.9% APR and a low $18 annual fee.*

The Gateway interest rate translates into some low monthly payments for your PC. For example, payments on a purchase of $2,000 would be $60 per month for 42 months.** Ask your sales representative about the DuoLine MasterCard, or call 800-846-1781 for an application.

*Cash advance fee is $1 plus 2% of the amount of the cash advance, but not less than $5 nor more than $10. Financing is available on approved credit with the Gateway DuoLine MasterCard, issued by Dial National Bank, Des Moines, Iowa. **The final payment may be less. The total of all payments is $2,489.40 which includes $489.40 in finance charges. The example given above assumes you have no other balance on your Gateway line of credit and that the APR does not change. This information does not apply to the MasterCard line of credit, which has different terms.

GATEWAY 2000

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

800-846-2065

4SX-33

- Intel® 33MHz 486SX Processor
- 4MB RAM
- 3.5" Diskette Drive
- 212MB 13ms IDE Hard Drive
- Intel Pentium™ Technology Ready
- Local Bus Graphics Accelerator w/ 512KB DRAM
- 14" Color CrystalScan® 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard
- Microsoft® Mouse
- MS-DOS® 6.2, Windows for Workgroups™ 3.11 & Tools on Top
- MS Works for Windows™
- EPA Energy Star Compliant

$1295 *4SX-25* **$1275**

4DX-33

- Intel 33MHz 486DX Processor
- 4MB RAM
- 3.5" Diskette Drive
- 212MB 13ms IDE Hard Drive
- Intel Pentium Technology Ready
- Local Bus Graphics Accelerator w/ 512KB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 101-Key Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- MS Works for Windows
- EPA Energy Star Compliant

$1495

MINI UPGRADE

At the time of purchase, you can upgrade your 4SX-25, 4SX-33 or 4DX-33 mini desktop system to include the following features:

- 128KB Cache
- 1MB Video DRAM
- 424MB 13ms IDE Hard Drive
- 124-Key AnyKey Keyboard
- Choice of Application Software

$225 *(A $275 value!)*

Sorry, offer good only at the time of system purchase.

4DX2-50

- Intel 50MHz 486DX2 Processor
- 4MB RAM, 128KB Cache
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- Intel Pentium Technology Ready
- Local Bus Graphics Accelerator w/ 1MB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey® Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$1795

HOME OFFICE PACK

Include these peripherals with your new Gateway desktop and you have everything you need for an efficient home office.

- Epson® Stylus 800 Ink Jet Printer
- TelePath™ II Fax/Modem
- 1 Parallel Cable

$429

Only with system purchase.

TOOLS TOP FROM CENTRAL POINT

Tools on Top™ is now included on all Gateway 2000 mini desktop, desktop and tower systems. Program includes file manager, desktop and emergency disk portions of Central Point's award-winning PC Tools for Windows.

VESA SYSTEMS

4SX-33V

- Intel 33MHz 486SX Processor
- 4MB RAM
- 5.25" & 3.5" Combo Drive
- 212MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB™ Graphics Accelerator with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Baby AT Case
- 5 ISA & 2 VESA®/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$1495

4DX-33V

- Intel 33MHz 486DX Processor
- 8MB RAM, 128KB Cache
- 5.25" & 3.5" Combo Drive
- 424MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB Graphics Accelerator with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$1995

4DX2-50V

- Intel 50MHz 486DX2 Processor
- 8MB RAM, 128KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB Graphics Accelerator with 2MB DRAM
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$2295

66MHz BEST BUY

- Intel 66MHz 486DX2 Processor
- 8MB RAM, 128KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB Graphics Accelerator with 1MB DRAM
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$2495

4DX2-66V

- Intel 66MHz 486DX2 Processor
- 16MB RAM, 256KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- VLB Graphics Accelerator with 2MB DRAM
- 15" Color CrystalScan 1572FS
- Baby AT Case
- 5 ISA & 2 VESA/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software
- EPA Energy Star Compliant

$2995

4DX2-66E

- Intel 66MHz 486DX2 Processor
- 16MB RAM, 256KB Cache
- 5.25" & 3.5" Combo Drive
- 500MB 11ms SCSI Hard Drive
- 32-Bit EISA SCSI Controller
- VLB Graphics Accelerator with 1MB DRAM
- 14" Color CrystalScan 1024NI
- Tower Case with 300-Watt Power Supply
- 6 EISA & 2 VESA/EISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software

$3495

energy
EPA POLLUTION PREVENTER

GATEWAY2000
"You've got a friend in the business."®

8 0 0 - 8 4 6 - 2 0 6 5

PENTIUM SYSTEMS

P5-60 BEST BUY

- Intel 60MHz Pentium™ Processor
- 8MB RAM, 256KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Graphics Accelerator with 2MB DRAM
- 14" Color CrystalScan® 1024NI
- Tower Case with 300-Watt Power Supply
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- 124-Key AnyKey® Keyboard
- Microsoft® Mouse
- MS-DOS® 6.2, Windows for Workgroups® 3.11 & Tools on Top
- Choice of Application Software

$2995

P5-60

- Intel 60MHz Pentium Processor
- 16MB RAM, 256KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 528MB 12ms IDE Hard Drive
- PCI Local Bus Graphics Accelerator with 2MB DRAM
- 17" Color CrystalScan 1776LE
- Tower Case with 300-Watt Power Supply
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software

$3995

PCI 486 SYSTEM

P4D-66

- Intel 66MHz 486DX2 Processor
- 16MB RAM, 256KB Cache
- Double-Speed CD-ROM
- 3.5" Diskette Drive
- 424MB 13ms IDE Hard Drive
- PCI Local Bus Diamond Viper Graphics Accelerator with 2MB VRAM
- 15" Color CrystalScan 1572FS
- Tower Case with 300-Watt Power Supply
- 4 ISA, 2 PCI & 1 PCI/ISA Slots
- 124-Key AnyKey Keyboard
- Microsoft Mouse
- MS-DOS 6.2, Windows for Workgroups 3.11 & Tools on Top
- Choice of Application Software

$3295

ULTIMATE UPGRADE

For the ultimate in performance, upgrade any 16MB desktop configuration to:

- 32MB RAM
- Diamond Viper Graphics Accelerator with 2MB VRAM

$999

Sorry, offer good only as an upgrade at the time of system purchase.

MULTIMEDIA KIT

Here's everything you need to add multimedia to any Gateway desktop PC. You won't find a better holiday price anywhere!

- Gateway 2000 16-Bit Sound Card, Sound Blaster-™Compatible
- Double-Speed CD-ROM
- 2 Labtec® Speakers
- Microsoft Encarta Encyclopedia
- Gateway System CD

$299

For system configurations that include a CD-ROM drive: **$132**
Only with system purchase.

SERVICE

Every Gateway 2000™ system is backed by:

- 30-Day Money-Back Guarantee
- One-Year Limited Warranty
- Lifetime Toll-Free Technical Support
- On-Site Service Available To Most Locations
- Lifetime BBS Membership
- FaxBack Automated Fax Service

Our money-back guarantee does not include shipping. On-site service is provided at no charge if our technicians determine it is necessary during the warranty period. If you would like to read the details of our warranty, guarantee and on-site service program, please call for a free copy.

Gateway 2000 is a corporate sponsor of

GLOBAL RELEAF

Printed on recycled paper with soy inks.

MICROSOFT® WINDOWS™ READY TO RUN

©1993 Gateway 2000, Inc. AnyKey, CrystalScan, black-and-white spot design, "G" logo and "You've got a friend in the business" slogan are registered trademarks, and Gateway 2000, ColorBook, DuoLine, EZ Point and TelePath are trademarks of Gateway 2000, Inc. The Intel Inside Logo, Intel and Pentium are trademarks or registered trademarks of Intel Corporation. All other brands and product names are trademarks or registered trademarks of their respective companies. Due to the volatility of the DRAM market, all prices and configurations are subject to change without notice or obligation. Prices do not include shipping. Energy Star compliant systems may not remain within EPA guidelines if upgraded to a Pentium processor.

SOFTWARE

If a system comes with "choice of application software," choose one of the following packages:

- Microsoft Excel for Windows™
- Microsoft Word for Windows™
- Microsoft Word and Bookshelf '92,® CD-ROM Edition
- Microsoft PowerPoint for Windows™
- Microsoft Project for Windows™
- The MS Entrepreneur Pack (Works,™ Publisher,™ Money,™ and games)
- Borland Paradox® database and Quattro® Pro for Windows spreadsheet
- Microsoft Access™ for Windows

With selected desktop systems you also get the following software and extras at no additional charge:

- *New* Microsoft MS-DOS 6.2
- *New* Microsoft Windows for Workgroups 3.11
- *New* Triton CoSession Host Remote Diagnostics (with all fax/modems)
- Central Point Tools on Top
- *New* Kiplinger's CA-Simply Money
- QAPlus Diagnostics
- Gateway System CD with Microsoft Multimedia Pack (with CDs only)
- Multimedia On-Line User's Guide (with CDs only)
- Gateway Mall On-Line Catalog (with CDs only)
- Gateway 2000 Computer Glossary

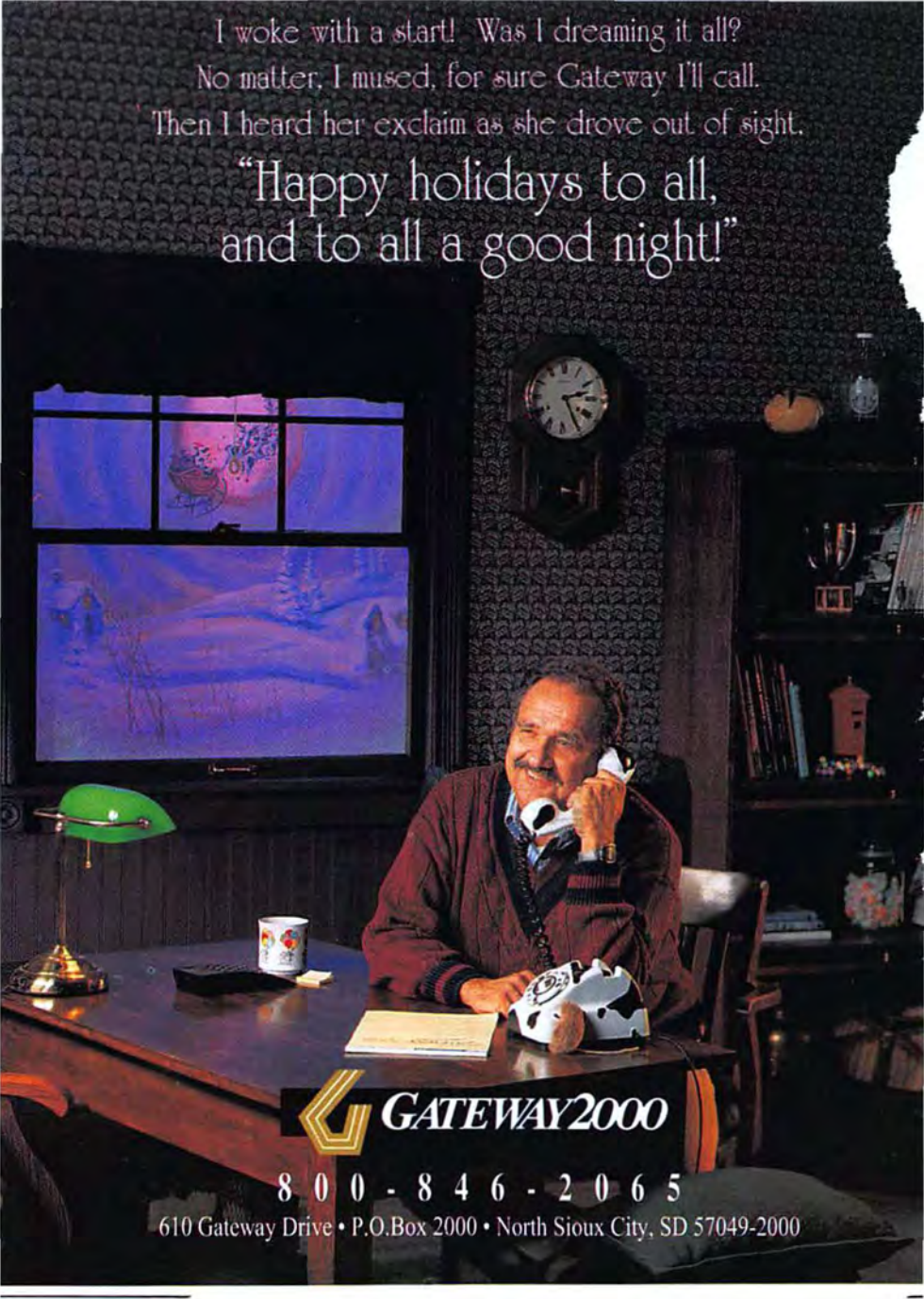
Her work all but finished,
the night nearly through.
The Cow looked right at
me and gave me a moo!
She spoke not in words,
but I read in her voice
The message that
Gateway's the logical
choice.

GATEWAY2000

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

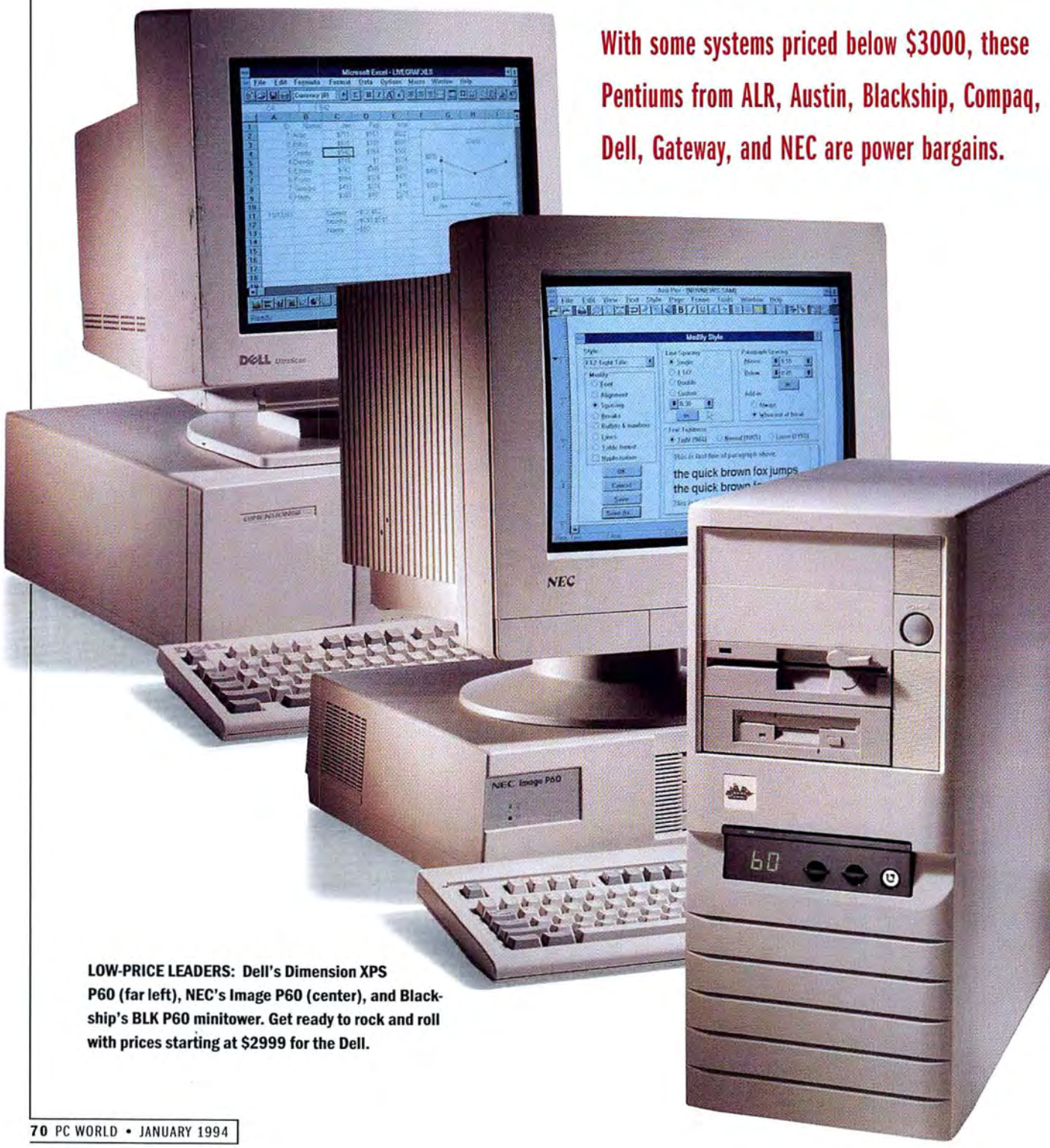
800-846-2065

Phone 605-232-2000 • TDD 800-846-1778
Fax 605-232-2023 • FaxBack 605-232-2561
Add-On Sales 800-846-2080
Toll free from Canada and Puerto Rico 800-846-3609
Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays(CST)


I woke with a start! Was I dreaming it all?
No matter, I mused, for sure Gateway I'll call.
Then I heard her exclaim as she drove out of sight,
"Happy holidays to all,
and to all a good night!"
GATEWAY2000
800-846-2065
610 Gateway Drive • P.O.Box 2000 • North Sioux City, SD 57049-2000

7 PENTIUMS FOR LESS

With some systems priced below $3000, these Pentiums from ALR, Austin, Blackship, Compaq, Dell, Gateway, and NEC are power bargains.



LOW-PRICE LEADERS: Dell's Dimension XPS P60 (far left), NEC's Image P60 (center), and Blackship's BLK P60 minitower. Get ready to rock and roll with prices starting at $2999 for the Dell.

Edited by Russell Glitman

THAN $3500

TEST DRIVE

Everybody wants a computer that rocks, but rock videos on the desktop are not a good enough reason to buy a new Pentium machine. That's what I keep telling myself as my eyes wander from the new video-enhanced Dell Dimension XPS P60 to my checkbook. As I fire up Pink Floyd's *Money* video once more, the dance revue fills the 17-inch screen and my conviction wavers.

One thing is certain, though: Pentium is arriving on the desktop with a vengeance. Fully configured Pentium machines start at $2995. Many of the systems include Intel's PCI (Peripheral Component Interconnect) local bus, which often runs faster than the VESA local bus, allows you to connect more peripherals, and offers the promise of Plug and Play card installation. However, the PC World Test Center found that at least one Pentium system with a VL bus, Advanced Logic Research's Evolution V/60, outperformed some Pentium-PCI systems. This could be due to a combination of the still-evolving PCI technology and the ALR design, which includes a write-back cache and a 64-bit bus between memory, cache, and the CPU.

Pentium systems are arriving on the desktop with a vengeance—fully configured machines start as low as $2995.

Dell Dimension XPS P60

Dell's Pentium multimedia system is one of the most engaging PCs to hit my desktop. Armed with the hottest hardware and loaded with powerful software, the Dimension XPS P60 marks a return to the style that put this irreverent Texas company on the map.

Based on a 60-MHz Pentium, the XPS uses PCI. The base Dimension XPS system, selling for $2999, features 8MB of RAM that can be expanded to 128MB, a 256K secondary cache, a 3½-inch floppy drive, a 450MB IDE hard drive, a 1MB #9 GXE PCI video card, a Panasonic 563 double-speed CD ROM drive, a 14-inch super-VGA color monitor, and a mouse.

What really makes the XPS sing is its optional Sigma Designs ReelMagic full-motion video card, which plays MPEG (Motion Picture Experts Group) audiovisual files. These are theater-quality, full-screen, full-motion images. Our preproduction system included the ReelMagic board, but the super-VGA drivers weren't ready, and our benchmarks produced anomalous results with the standard 1MB PCI video card that came with the system.

Compaq Deskpro XE 560

You didn't expect to see Compaq in a story about low-cost, high-end computers? Shame on you. That doesn't mean that the Houston juggernaut is crowding the $2999 price point seen elsewhere: The XE has an estimated street price of just under $3500—without a monitor. The Compaq may still represent the best value, though, because it's arguably the best-designed system.

Compaq's unique TriFlex/PC architecture uses a 128-bit channel between memory and the secondary cache, so that while the Pentium is digesting one chunk of data, the next chunk is on its way. This architecture produces optimal performance. Case in point: the XE 560 was the best performer in our Freelance for Windows and Paradox for

PHOTOS: JOHN GREENLEIGH; ILLUSTRATION: JEFF KOEGEL

News Monitor

WINDOWS ON THE MAC: Apple is developing a hybrid PC-Macintosh desktop system that will run both Windows and Mac software. Dubbed the Quadra 610, DOS Compatible, it includes an Intel 486SX 25-MHz processor and a Motorola 68040 25-MHz CPU.

The 486SX will be on a daughtercard with its own VGA video, so you'll be able to run Mac and Windows apps concurrently. Hot keys will let you toggle between DOS/Windows and Macintosh apps and cut and paste text and graphics between environments. The system, based on Apple's Quadra 610, should be available in the first half of 1994, according to Apple spokesperson Renee Austin. No price has been set. MS-DOS 6.2 will be included, but not Windows. One drawback for corporate buyers: No LAN support is planned for the DOS environment.

PLUG 'N' PLAY UPDATE: Expect to see Plug and Play PCs in early 1994. That's the word from the top hardware and software companies, which recently released the final Plug and Play BIOS specification. Designed to make PCs easier to configure and use, the spec will allow automatic installation and configuration of peripherals, such as memory cards, modems, and sound cards—no need to fiddle with jumpers, DIP switches, or DMA and IRQ settings. Compaq and Phoenix Technologies codeveloped the Plug and Play BIOS, available free of charge. Windows 4.0, due to ship at the end of '94, will support the Plug and Play spec.

(continued on page 73)

High-Speed, Low-Price Pentium PCs

	Excel for Windows 4.0	Freelance for Windows 1.0	Paradox for DOS 3.5	Word for Windows 2.0
ALR Evolution V/60	62	90	77	81
Austin Premier P5-60 System	74	90	121	84
Blackship BLK P60	70	97	108	95
Compaq Deskpro XE 560	69	82	70	81
Gateway 2000 P5-60	67	89	109	83
NEC Image P60	74	89	97	85

Time in seconds; lower number is better. *Source: PC World Test Center*

Continued from page 71

DOS tests, and it tied for first place with the ALR Evolution V/60 system in our Word for Windows test.

The XE includes 8MB of video RAM expandable to 136MB, a 256K secondary cache, a Compaq QVision local bus graphics adapter with 1MB of RAM expandable to 2MB, one floppy drive, Enhanced Business Audio with Sound Blaster compatibility, and a 270MB hard drive. MS-DOS 6.0, Windows 3.1, the Microsoft Windows Sound System, and Compaq's TabWorks Windows front end are also part of the package.

Gateway 2000 P5-60

Despite the crowd of well-known companies trying to encroach on its high-end mail-order business, Gateway 2000 is holding its position on the cutting edge with a line of snappy Pentium systems priced from $2995 to $3995. The basic model includes 8MB of RAM expandable to 128MB, a 256K secondary cache, one floppy drive, a dual-speed CD ROM drive, a 424MB IDE hard drive, a PCI local bus ATI Ultra XLR graphics accelerator with 2MB of RAM, a super-VGA monitor, a programmable Any-Key keyboard, MS-DOS, Windows 3.1, a Microsoft mouse, Central Point's Tools on Top, QA Plus diagnostics software, and Microsoft Works for Windows 2.0. This well-priced system is a sturdy contender, coming in second in the Excel test, tying for second in the Freelance test, and scoring third in the WinWord event.

NEC Image P60

NEC's Image P60 system relies on its Diamond Viper, PCI local bus Windows accelerator with 2MB of video RAM and support for 16-bit and true-color 24-bit graphics. At $3499 with no monitor, the P60 has a 250MB IDE hard drive, one floppy drive, a 256K secondary cache, and 8MB of RAM expandable to 192MB. MS-DOS 6.0 and Windows 3.1 come with the system. The preproduction NEC was a middle-of-the-road performer, tying for second in Freelance and scoring third in Paradox.

ALR Evolution V/60

Although Advanced Logic Research advertises this system as a "$2500 Pentium," it costs more than the better-equipped Dell when you add such essentials as a hard drive and monitor to its base price. With 8MB of RAM (expandable to 128MB), a 420MB IDE hard drive, and a Western Digital Paradise video card with 1MB—but without a monitor—the Evolution V/60 should sell for about $3500 on the street. With the 14-inch, noninterlaced, multiscan super-VGA monitor, its list price will be $3926. DOS 6.2 and Windows 3.1 are bundled. The system has one floppy drive and a 256K secondary cache. The snappy VL-bus system won top honors in the Excel for Windows 4.0 test. That record was marred by its performance on the Freelance for Windows test: It tied for next to last.

Ergonomic Regulations:

The Occupational Safety and Health Administration (OSHA) has turned its attention to the fast-growing problem of repetitive strain injury; ensuing regulations could affect PC users and their employers. If existing laws are any indication, regulations that mandate how PC workstations are set up could cost employers up to $1000 per employee for new equipment. The flip side would be good news for PC users: Ergonomically correct workstations might prevent career-ending repetitive strain injuries (RSIs) such as carpal tunnel syndrome.

OSHA is analyzing data from a recently completed survey of 9000 U.S. companies, and proposed regulations could be issued in 1994, according to OSHA spokesperson Akio Konoshima. However, enacting those regulations will be a long, complicated process, and it is unlikely they will become law before 1996.

GORDON STUDER

These regulations would be the first aimed at preventing RSIs in the workplace. An existing law, the Americans With Disabilities Act, covers people already afflicted with RSIs. This law requires companies to make "reasonable accommodations" for such employees or face prosecution and payment of compensatory damages. Since the ADA's inception, almost 12,000 cases have been filed. Most are settled out of court, with companies agreeing to make workstation changes based on recommendations from the employee's doctor. Ergonomic adjustments can cost as little as $150 for swivel arm supports and as much as $1000 for arm supports plus an ergonomically correct keyboard and chair. If OSHA regulations specify workstation equipment, costs could be similar.

Seven Pentiums for $3500 or Less

Pentium power at what used to be 486 prices.

ALR Evolution V/60

Estimated Street Price:
Without monitor, $3500
Advanced Logic Research, 800/444-4257
Reader service no. 714

Austin Premier P5-60

Pricing: $2999
Austin Computer, 800/752-1577
Reader service no. 715

Blackship BLK P60

Pricing: $3395
Blackship Computer Systems, 800/531-7447
Reader service no. 716

Compaq Deskpro XE 560

Estimated Street Price:
Without monitor, $3479
Compaq Computer, 800/345-1518
Reader service no. 717

Dell Dimension XPS P60

Pricing: $2999
Dell Computer, 800/289-3355
Reader service no. 718

Gateway 2000 P5-60

Pricing: $2995
Gateway 2000, 800/846-2065
Reader service no. 719

NEC Image P60

Estimated Street Price:
$3499 without monitor
NEC, 800/632-4636
Reader service no. 720

GATEWAY'S $2995 P5-60 comes with a CD ROM drive.

Blackship BLK P60

The Blackship BLK P60, which has 16MB of RAM and a roomy 512K secondary cache, seems outfitted for success. For $3395 you get two floppy drives, a 340MB IDE hard drive, a caching disk drive controller with 1MB of RAM on board, a VESA local bus Orchid Fahrenheit graphics card with 1MB of RAM, a Microsoft mouse, a 14-inch flat-square super-VGA monitor, DOS 6.0, Windows 3.1, and a minitower case. Too bad the Blackship didn't perform better—it came in last in our Freelance and Word for Windows tests.

Austin Premier P5-60 System

With tight engineering, rock-bottom prices, and environmentally correct corporate policies, Austin Computer Systems is becoming one of our favorite vendors. Its Premier P5-60 System is a solid value, with 8MB of RAM expandable to 128MB, a 256K secondary cache, one floppy drive, a Sony 31A/02 CD ROM drive, and a 14-inch monitor, all for $2999. You also get a choice of one Lotus application.

The P5-60's performance was a bit of a disappointment; it tied for last in our Excel test and was last in the Paradox test.

Decisions, Decisions

Do you need a Pentium? Maybe not. They run only about 30 percent faster than 486DX2-66s, although bigger performance gains will be realized when applications optimized for Pentium arrive. Unless you do CAD, crunch big spreadsheets, run graphics-intensive software, or just want the biggest, toughest machine on the block, the best thing to do may be to ask these companies how much they're selling 486DX2-66s for these days.

Expect to see full reviews of these systems in future issues of *PC World*. But if you decide to make the jump to a Pentium now, the race is on, and there are clear frontrunners. For business use, there's no better Pentium package around than the Compaq Deskpro XE 560. For the small office or home office, the ALR Evolution is a close second in performance, but for personal use, nothing will rock your desktop like the Dell Dimension XPS P60 with Sigma Designs' ReelMagic card. *Money, it's a hit.*

—Joe Abernathy

News Monitor

(continued from page 71)

HIGH PERFORMANCE IDE: A new Enhanced IDE spec will offer many SCSI features, drive makers say. Enhanced IDE will boost data transfer rates to between 11MB and 13MB per second over a local bus (up from standard IDE's 2MB to 3MB per second on the ISA bus) and will remove the 528MB limit on drive capacity. Enhanced IDE will support multiple IDE devices and other peripherals such as CD ROM drives. Western Digital is already shipping an Enhanced IDE drive.

BULLETPROOF WINDOWS FOR $49: IBM claims its latest OS/2 release, OS/2 for Windows, installs a complete 32-bit version of OS/2 2.1 on your system without disturbing the existing configuration. This can mean fewer crashes and improved multitasking. This program lets Windows 3.1 users run, with minimal modification, Windows applications they've already installed by clicking familiar icons from within OS/2. Through February 17, the 11-disk product will sell for $49; then the price will jump to $149.

NEW NEC NOTEBOOKS: NEC's Versa E (Enhanced) Series notebooks, priced at $2899 to $6029, should be available by the time you read this. The systems use an SL Enhanced 40-MHz or 50-MHz 486DX2 processor and boast brighter displays, with 9.5-inch STN sidelit monochrome or active-matrix color screens. The notes measure 11.7 by 9.3 by 2.1 inches. The monochrome

(continued on page 75)

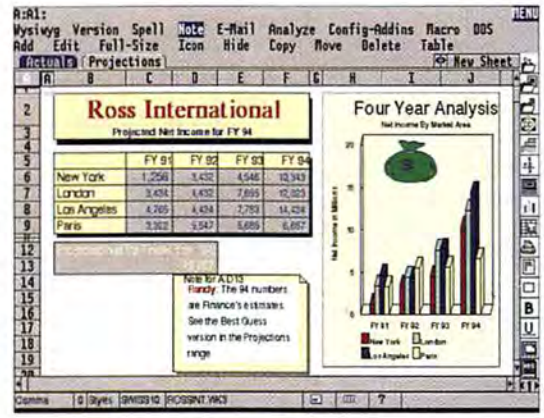
PHOTO: JOHN GREENLEIGH; ILLUSTRATION: JEFF KOEGEL

A Bit of Windows in 1-2-3 Release 4

TEST DRIVE Fledgling spreadsheet users have never had it easy. Early DOS products had a steep learning curve and left many novices confounded and unproductive. Though Windows versions made these products easier to use, they have never run well on the anemic 286- and 386-based systems that companies typically pass down to their less experienced staff.

Lotus's 1-2-3 release 4 for DOS addresses these issues. Lotus has added numerous Windows-like features, such as scroll bars and dialog boxes, that facilitate on-screen navigation and provide easier access to powerful features. The program, like its release 3.4 predecessor, can run on a 286 PC with 1.5MB of RAM and requires up to 8MB of hard disk space, depending on the installation options you choose.

For power users and others who don't have the hardware or inclination to use a Windows spreadsheet, this new DOS product offers a sampling of goodies introduced in 1-2-3 for Windows release 4, such as E-mail support and version management.



TRACK DIFFERENT VALUES FOR RANGES and create long version names with the Version Manager, an abridged version of the feature offered in the Windows product.

In addition, the product retains almost complete compatibility with earlier versions, so macros and DOS spreadsheet applications should run without a hitch. (The Windows version introduced changes to the menu structure; consequently, some macros won't run without modification.) Finally, the customizable interface lets you turn off the graphical interface features and invoke the character-based interface.

If the improvements geared toward advanced users sound a little sparse—they are. These users may be better off bypassing this product and moving to a Windows spreadsheet.

Graphical Interface-lift

Release 4 borrowed some features from the Windows version that make locating commands easier. In the pre-beta version we saw, the vendor replaced many of the product's crude lists of menu options, called setting sheets, with interactive, informative dialog boxes that save keystrokes and avoid confusion. A live status bar at the bottom of the screen, common to Lotus Windows products, offers a miniature menu of options for changing the numeric format, font, or other style features of a current range selection. The addition of scroll bars also makes on-screen navigation easier.

Lotus also made logical changes to the

DOS Obituary Premature, Users Say:

The reports of the DOS spreadsheet's death have been greatly exaggerated. Take the 1300 spreadsheet users for whom Dianne Lemon provides support at BellSouth Telecommunications in Birmingham, Alabama. Lemon, an assistant staff manager in computer support, estimates that about half these employees use the DOS version of 1-2-3. "They say [the DOS version] is fine—it's working," she explains. "They don't want to learn Windows."

For other BellSouth users, Windows applications aren't really an option. The company has migrated many of its 286-based systems to users who were previously stuck with dumb terminals. However, because of a freeze on PC purchases, these 286 systems haven't been upgraded to run Windows applications efficiently.

If Lemon has any say in it, however, one upgrade many of her users will make is to Lotus 1-2-3 release 4 for DOS. She likes the Windows-like interface for two reasons: First, it ensures company-wide consistency by providing Windows spreadsheet users with a familiar interface. Second, it may ease the transition of DOS users to Windows.

She also likes the cell annotation feature, which will make it easier for her users to explain how they arrived at certain calculations in the pricing spreadsheets they create for new products and services. In addition, because these spreadsheets are often group projects, she thinks her users will find the product's cc:Mail support a real time-saver.

Lemon isn't alone. Though Windows spreadsheet products have been gaining steadily in popularity, the demand for DOS versions will not disappear anytime soon, according to analyst Mary Conti Loffredo of International Data Corporation, a market research company based in Framingham, Massachusetts. Many users are content with their 286 and 386 systems and don't want to incur the expense and trouble of upgrading to Windows, she says.

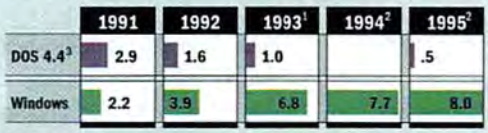
MIKE CLEMMER

menu structure. In particular, the prerelease version we saw showed a new Tools menu that consolidates features that were previously buried in the program or activated by arcane keyboard commands. For example, the add-ins option under the Config menu item replaces the <Alt>-<F10> command to let you specify auto-loading add-ins. The System command, which takes you to DOS, was moved from the main menu to Tools. The Macro command enables you to run macros from the menu bar instead of by pressing <Alt>-<F3>.

The worksheet tabs make managing 3-D spreadsheet files easier. As in the Windows product, the tabs can be named and appear at the top of the page. Each tab represents a different worksheet in a 3-D file. To display a sheet, click on its tab. If you want to load more than one 3-D file, the program assigns matching colors to all sheets from the same file, eliminating confusion.

DOS Spreadsheets Slip Under Windows

Spreadsheet units shipped (in millions)



[1]Estimated [2]Projected

[3]The main competitors in the DOS spreadsheet market are Lotus's 1-2-3 2.x and 3.x products and Borland's Quattro Pro products. Lotus 1-2-3 currently has 69 percent of the DOS spreadsheet market.

Source: International Data Group

1-2-3 release 4 for DOS

Numerous features borrowed from the Windows version give this DOS champion another round in the ring.

Key Features: **Improved interface • Windows-like dialog boxes, status bar, scroll bars • 3-D Worksheet Tabs • Version Manager • E-mail support • Spelling checker • Cell annotation**

Estimated Street Price: **$350, $100 for upgrade**

Availability: **First quarter 1994**

Lotus Development, 800/343-5414

Reader service no. 721

More Power to You

Lotus added a cell annotation feature for attaching an explanatory note to any cell in a worksheet. Another handy addition is a spelling checker with more than 200,000 words, which can share its dictionary with the Windows version should you decide to upgrade later. A Worksheet Column Fit-Widest command eliminates annoying asterisks when a number is too long for its column. Lotus also plans to add a backup feature that automatically saves files at timed intervals. E-mail support lets you send files via cc:Mail for DOS without exiting the spreadsheet, a time-saver if you use this mail program.

Lotus also included a scaled-down Version Manager, introduced in the latest Windows release, which lets you create versions of a range and group them into what-if scenarios. This feature is adequate for an individual user, but it lacks key work-group features found in the Windows product. For example, you can't easily maintain an audit trail, tracking information such as author, date of entry, and special comments. (The Windows product dedicates sortable fields for version information and can automatically pull details, such as the date of creation or modification and the author's ID, from a user's PC. The DOS product has a single 32-character version-name field—a user can include descriptive information but it must be done manually and it can't be separated into sortable fields.) Also, the DOS product doesn't offer the merge feature for consolidating scenarios from different users.

The DOS version lacks numerous other features of its more powerful Windows counterpart. For accessing data in external databases, you're still stuck with the clumsy DataLens technology, which was replaced in the Windows product. You're also missing the 90-plus new @functions, in-cell editing, and some intelligent charting capabilities.

Still, if you need a DOS spreadsheet for a novice user, a Windows-phobe, or anyone with a usable but underpowered PC, this product remains one of the best in its class.

—Randy Ross

JEFF KOEGEL

News Monitor

(continued from page 73)

version weighs 6.2 pounds; the color model, 6.9 pounds. NEC claims to have boosted local bus video performance by 20 percent, and battery life is 5 to 7 hours on the monochrome and 3 to 5 hours on the color. The removable 1.44MB floppy drive lets you slide in an optional second battery, doubling the time between charges, according to NEC. The new Versas have a lighter AC power supply and an embedded trackball, located below the <Space> bar. Hard drives come in 120MB or 250MB sizes, and 4MB of RAM (upgradable to 20MB) is standard.

SIMON SAYS PHONE HOME: **BellSouth and IBM will offer a personal communicator built around a cellular phone. The 8-by-2.5-by-1.5-inch device has a backlit LCD screen, 1MB of PS RAM, 1MB of RAM, a PCMCIA Type II slot, and a battery pack good for 8 hours of standby use or 1 hour of live use on the phone. It weighs 18 ounces. With a PCMCIA paging card, you can receive alphanumeric pages even when the device is off. A wireless modem sends and receives E-mail (via Lotus cc:Mail) or faxes. You can write faxes on screen with an "inking" technology. The DOS-based Simon is due in the first quarter of 1994 at an undetermined price.**

Edited by Randy Ross

Contributors: Joe Abernathy, Jeff Bertolucci, Russell Glitman, Anita Hamilton, Laurianne McLaughlin, and Randy Ross

Under $1000 for 600-dpi PostScript Printer

TEST DRIVE Sharp's JX-9460PS, the first 600-dpi printer with PostScript for less than $1000, redefines what you can afford in a personal printer.

Whether you're in a home office, a small office, or a corporate office, you'll appreciate the 6-ppm speed and PostScript Level 1 capability, which lets you quickly create documents with high-quality graphics, charts, and scanned images. We were pleased with the printer's performance and the output quality of newsletter pages created in Ventura Publisher. To attain an estimated street price of $999, Sharp had to make a few compromises. But overall the JX-9460PS makes an ideal choice for desktop publishers on tight budgets.

Sharp JX-9460PS

The first 600-dpi printer with PostScript for under $1000, ideal for graphics jobs such as newsletters and handouts.

Key Features: 600-dpi resolution • 6-ppm speed • Small footprint

Pricing: $1199 list, $999 street

Availability: Immediate

Sharp Electronics, 201/529-9593

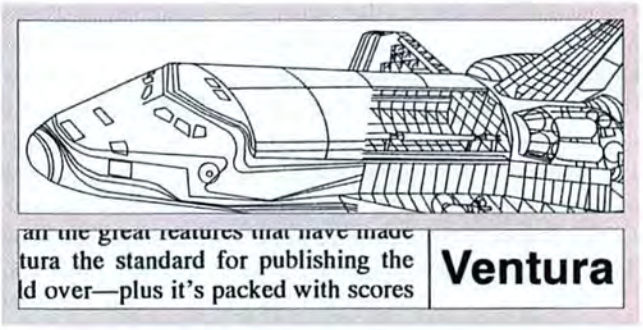
Reader service no. 703

To beat the price of the chief competition, Hewlett-Packard's $1729 LaserJet 4MP (which offers a 4-ppm engine, 600-dpi resolution, and PostScript Level 2), Sharp is shipping the JX-9460PS with only 2MB of memory. This lower memory requirement is possible thanks to a new memory-saving technology from Phoenix Technologies called SoftBand. The technology sends bands of data to the print engine instead of sending a page's worth, as other PostScript printers do. This reduces the required memory for a 600-dpi PostScript printer from the typical 6MB used in the HP printer.

Beside price and output quality, footprint size—a compact 13 by 14.4 inches—may be this printer's next best feature. It's slightly taller than the 14.7-by-15.4-inch 4MP but takes up a little less space on your desk. The JX-9460PS also offers 35 PostScript fonts and 13 outline fonts for PCL 5 mode. The printer has parallel ports and offers optional serial ports, and both can be active at the same time. An AppleTalk interface is optional. The printer uses a 16-MHz AMD RISC processor.

The Sharp does have one big drawback for anyone who plans to print full-page scanned photographs. With 2MB and SoftBand, it does a good job with typical newsletter-size scanned images, but it can't print a full-page image without an additional 4MB of RAM. Sharp charges $457 list for a proprietary 4MB memory card—a hidden cost that hikes the printer's price to around $1400.

Compared to the HP LaserJet 4MP, the Sharp printer has a few other limitations you should consider. In PCL mode, the Sharp can print only at 300-dpi resolution. If you want automatic emulation switching, which lets the printer automatically adjust for documents whether they're composed for PostScript or PCL 5, you'll need an extra 1MB ($141 list).



600 DPI FOR YOUR DESKTOP: The JX-9460PS prints almost photo-quality images. It's perfect for projects like newsletters.

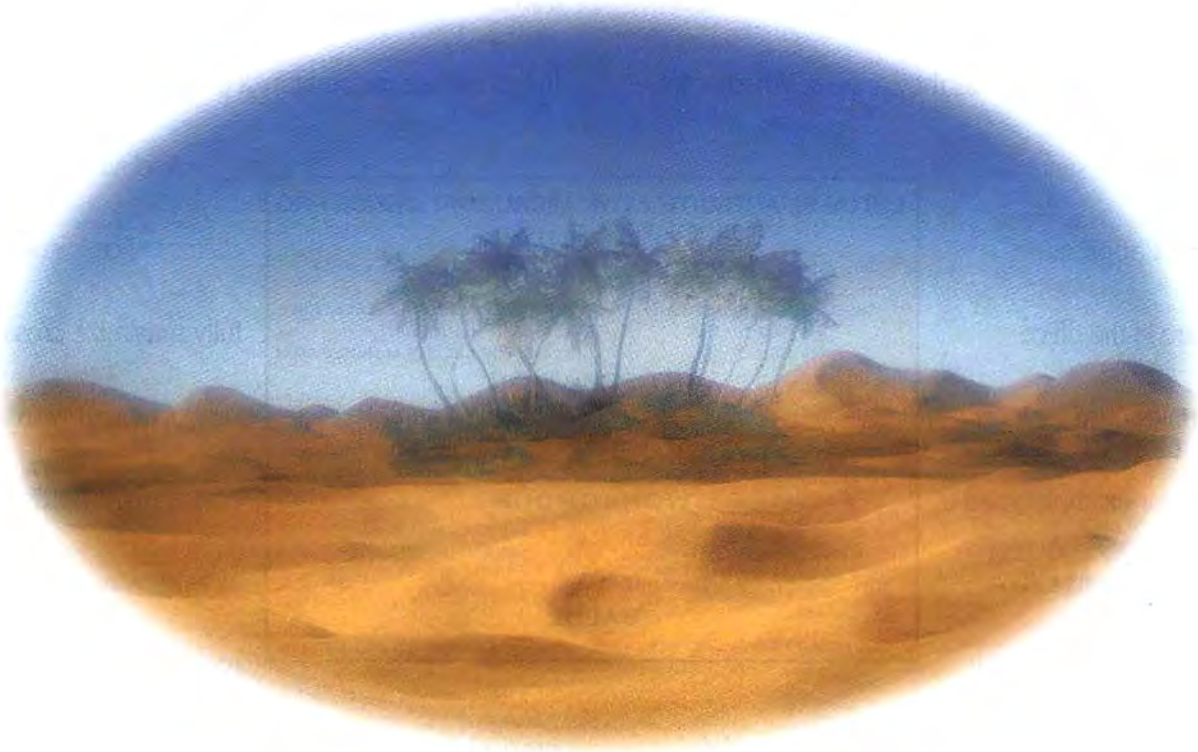
In addition, the printer doesn't meet Energy Star compliance, though it does provide a sleep mode. It comes with a 250-sheet tray; an additional tray isn't available. Since the JX-9460PS is targeted as a personal device, its speed and paper capacity make it a poor choice for a LAN.

Still, after you weigh the pros and cons, the Sharp is a powerful personal printer at a reasonable price. Sharp has put PostScript and professional-looking documents within reach of a wider market. And there's more good news ahead. Sharp's new printer may be only the tip of the iceberg: Analysts say competition in the low-cost 600-dpi marketplace will really heat up in 1994. Users can expect more products and even lower prices. In fact, Sharp has announced that the JX9660-PS, an 8-ppm version of this printer, will ship in late November 1993 (with two 250-sheet paper trays and an AppleTalk interface). Consumers will have to watch this market carefully to get the best deals.

—Laurianne McLaughlin

PRINTING POSTSCRIPT FOR LESS: Sharp's JX-9460PS.

JOHN GREENLEIGH



YOU KNOW HOW SOME THINGS ALWAYS LOOK GOOD FROM A DISTANCE?

MAYBE YOU'D BET
LOOK AT MICROSOF

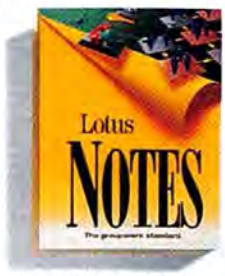
As anyone who's ever been in the desert can tell you, things aren't always as they appear. Whether it's an oasis in the sand. Or a suite of application software in the office.

Unless you look very closely, for example, you'd swear Microsoft® Office was a revolutionary new way to use, manipulate and share business data through integrated software. When, in reality, Lotus® SmartSuite® achieved that distinction over a year ago.

A closer inspection will also demonstrate that not all of Microsoft Office's five applications are designed for general business users. And some new versions aren't yet available at all. Lotus SmartSuite, on the other hand, has five of the leading, award-winning, most usable applications. All of which truly complete the desktop of every Windows™ user.

LOTUS SMARTSUITE 2.1 VS. MICROSOFT OFFICE PRO	
APPLICATIONS	
1-2-3® RELEASE 4 AMI PRO® 3.01 FREELANCE GRAPHICS® 2.01 APPROACH® 2.1 ORGANIZER™ 2.1	EXCEL 5.0 WHEN AVAILABLE WORD 6.0 POWERPOINT® 4.0 WHEN AVAILABLE ACCESS™ COUPON FOR 1 SEAT OF MICROSOFT MAIL
INTEGRATION	
LOTUS APPLICATION MANAGER COLLECT & COPY DDE, OLE CONSISTENT USER INTERFACE	MICROSOFT OFFICE MANAGER DDE, OLE (2.0 IN WORD) SEMI-CONSISTENT USER INTERFACE
WORKGROUP	
ALL APPS MAIL-ENABLED VERSION MANAGER™ INTEGRATED WITH NOTES® THRU NOTES/FX™	ALL APPS MAIL-ENABLED SCENARIO MANAGER
VALUE	
$299 COMPETITIVE UPGRADE	$348 COMPETITIVE UPGRADE

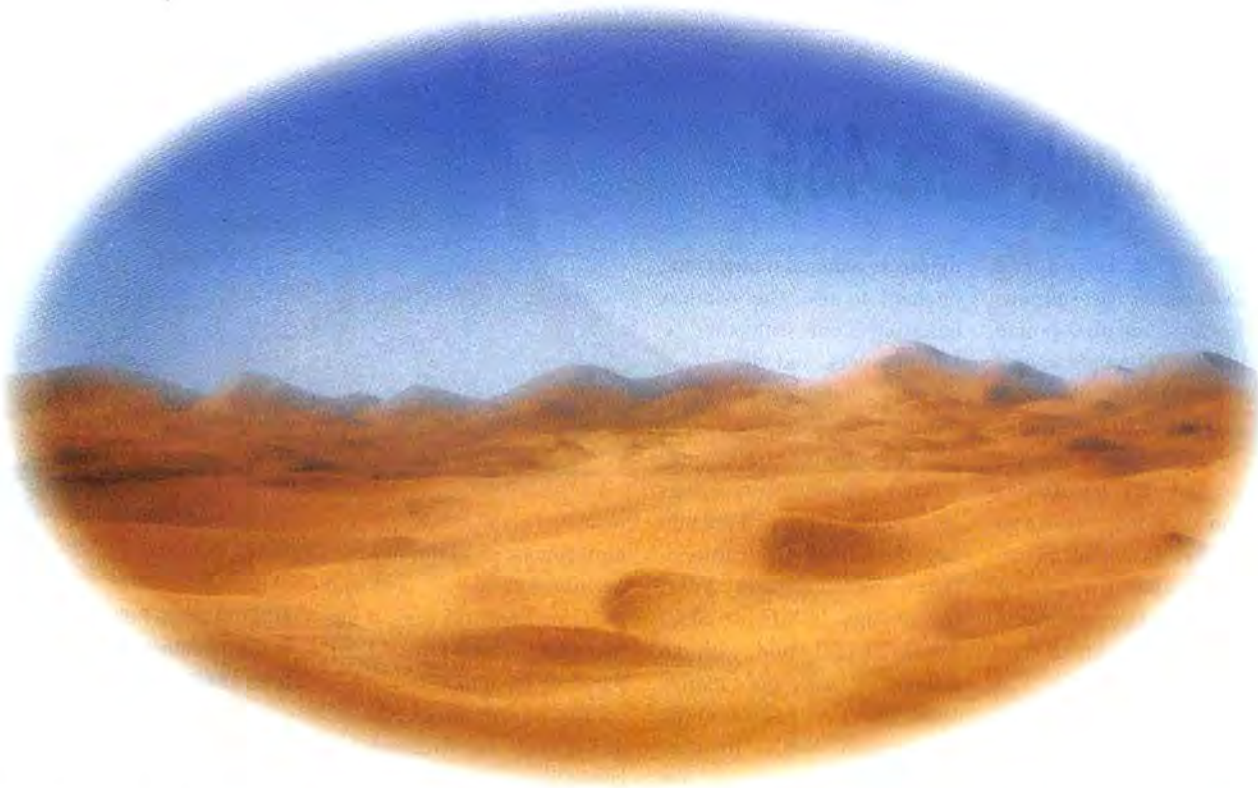
And while Microsoft claims Office is going to fully maximize cross-product integration and consistency, Lotus is already way down the road to achieving precisely that across all five applications. Sharing the same user interface. With common menus. And SmartIcons.® To say nothing of task-oriented functions that cross applications. Collect and Copy for instance. With a single click, it lets users gather data from 1-2-3® and Freelance Graphics® and combine it into an Ami Pro® word processing document.



SmartSuite and Lotus Notes. The secret to integrating workgroups instead of just applications.

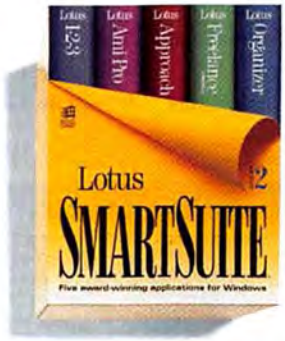
Of course, you might be just as easily deluded

*In Canada call **1-800-GO-LOTUS** **$299 direct from Lotus. Offer expires 1/31/94. Qualifying competitive products are Microsoft Excel, Borland* Quattro* Pro (not including SE), Microsoft Word, WordPerfect* Wordstar, Symphony,* Ami Pro, Freelance Graphics, Approach and Graphwriter.* ©1993 Lotus Development Corporation, 55 Cambridge Parkway, Cambridge, MA 02142. All rights reserved. Lotus, SmartSuite, SmartIcons, Ami Pro, 1-2-3 is a registered trademark of Approach Software Corporation, a wholly-owned subsidiary of Lotus Development Corporation. Microsoft and PowerPoint are registered trademarks and Windows and Microsoft Access are trademark of Wordstar International Inc. DisplayWrite is a registered trademark of International Business Machines Corporation.



TER TAKE A CLOSER
T OFFICE AFTER ALL.

into believing that Microsoft Office is workgroup enabled. When, in fact, Office can only integrate applications, SmartSuite can actually integrate entire groups of people. With Lotus Notes® groupware, SmartSuite users can access, share, track and manage business data like never before. Not only can it be routed, it can be revised, stored and accessed concurrently by multiple users working in collaboration.

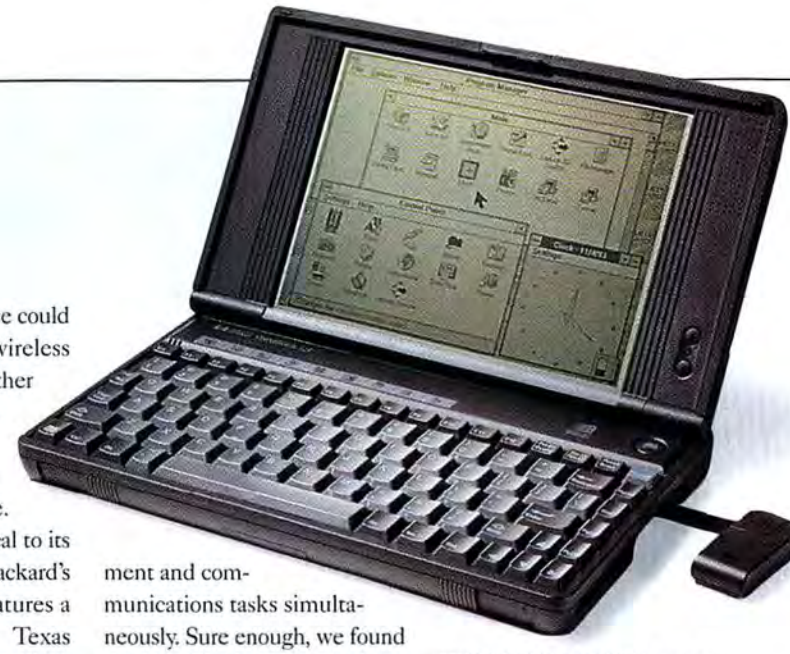


And right now, you can upgrade from any Lotus or competitive product to SmartSuite 2.1 for just $299.** Just visit your Lotus Reseller. Or call Lotus for a demo disk at **1-800-TRADE-UP, ext. 9345.*** We can assure you, this is one time you really will be able to believe your eyes.

Lotus
Working Together*

DisplayWrite® PowerPoint, Harvard Graphics® Corel Draw, WordPerfect Presentation, Aldus® Persuasion, dBase,® Paradox® Access, SuperBase and Filemaker. Qualifying Lotus products include 1-2-3 (excluding 1-2-3 for Home) Freelance Graphics, Lotus Notes, Symphony, Graphwriter and Working Together are registered trademarks and Lotus Organizer, Version Manager and Notes/FX are trademarks of Lotus Development Corporation. Approach trademarks of Microsoft Corporation. Borland, Quattro, dBase and Paradox are registered trademarks of Borland International, Inc. WordPerfect is a registered trademark of WordPerfect Corporation. Wordstar is a registered Harvard Graphics is a registered trademark of Software Publishing Corporation. Aldus is a registered trademark of Aldus Corporation.

OmniBook Gets 486



MULTITASKING POWER comes to the OmniBook 425, thanks to its 486SLC/e processor.

TEST DRIVE Introduced last summer, the Hewlett-Packard 3-pound OmniBook 300 brought several innovations to the subnotebook market. They included a miniature pop-out mouse, a wireless infrared link for transferring files, and a diskless model that stores data on PCMCIA memory cards. Unfortunately, these innovations didn't necessarily result in a better subnote. The miniature tethered mouse could be hard to use, the wireless link worked only with other HP products, and the diskless model came bundled with a measly 10MB of storage space.

While virtually identical to its older sibling, Hewlett-Packard's new OmniBook 425 features a faster microprocessor: Texas Instruments' 25-MHz 486SLC, a 486SLC/e hybrid with an internal 1K cache and a narrow 16-bit data path (similar to the now-ancient 386SX). By comparison, the OmniBook 300 uses AMD's slower 386SXLV, a 386SX clone.

Users of high-speed modems will definitely prefer the OmniBook 425. In *PC World* tests, the OmniBook 300 had problems running data communications sessions faster than 4800 bits per second. According to OmniBook product manager Marcia Coffee, the 425's Texas Instruments processor has more power for multitasking, including handling power management and communications tasks simultaneously. Sure enough, we found the OmniBook 425 worked just fine with our 14.4-kbps AT&T Paradyne modem.

Like the OmniBook 300, the 425 is built for Windows but lacks the muscle to do the job. The unit comes with 2MB of RAM and several Windows applications in ROM, including Microsoft Word and Excel, LapLink Remote Access, a scheduler, a phone book, and a PIM. If you plan to multitask several Windows apps or run a DOS session in a window, you'll want to purchase an additional 2MB of RAM ($179). The OmniBook 425 with a 10MB flash disk is $2375; with a 40MB hard disk, it's $2125.

The new OmniBook retains the original's nonbacklit LCD screen, which is hard to read in dim lighting. HP claims the unit can run for 8 hours using a flash disk and 4½ hours with a hard disk. The wireless file transfer utility still works only with HP's Vectra desktops, other OmniBooks, and the HP 100LX hand-held unit, although the company says that it is working on licensing its infrared technology to other PC manufacturers.

–Jeff Bertolucci

OmniBook 425

New 3-pound subnotebook boasts better performance.
Key Features: Texas Instruments 486SLC/e CPU • Pop-out mouse • Wireless file transfer utility • Windows apps in ROM
Pricing: With 10MB flash disk $2375, with 40MB hard disk $2125
Availability: Immediate
Hewlett-Packard, 800/752-0900
Reader service no. 704

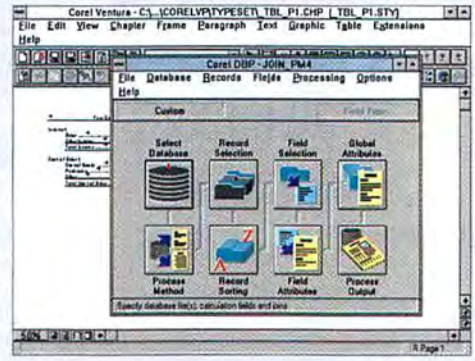
Corel's DTP Venture:

Will high-end DTP software prices plunge in the wake of Corel's purchase of Ventura Publisher and introduction of the $249 version 4.2, priced $500 less than competitors PageMaker, QuarkXPress, or FrameMaker?

Not right away, say industry experts, even though Corel is also throwing in Corel DataBase Publisher 4.2, Adobe Acrobat Reader, Ventura Separator, Ventura Scan, 75 slick document templates, and two CD ROMs containing over 600 Bitstream TrueType and Type 1 fonts, 10,000 pieces of clip art in EPS format, and 100 royalty-free Kodak PhotoCD photographs.

Corel's low pricing is unlikely to influence its competitors, says Rick Altman, author of four books on Ventura. "Ventura has slid so far in popularity that Aldus and Quark probably will not drop their prices yet."

Dataquest's principal analyst for work-group computing, Chuck Stegman, concurs. "Right now in desktop publishing, market share determines price....Switching page layout programs is not easy." Though its $249 price will attract companies entering the field, Stegman believes there aren't enough such firms to influence pricing much.



The price stability may change when Corel incorporates Ventura in the next CorelDraw upgrade. Corel says version 5.0 will concentrate on usability and conformity with Windows' interface. An easier-to-use Ventura Publisher bundled with CorelDraw could provide all the graphics and DTP features most PC users would ever need. Corel Corp., 800/772-6735. Reader service no. 705

JOHN GREENLEIGH

OS/2 Multimedia Presentations

TEST DRIVE How would you like to pack a secret weapon in your presentation arsenal that gives you the combined power of Software Publishing Corporation's Harvard Graphics and Asymetrix's Multimedia ToolBook? That sort of power exists, but you'll find it in an unexpected place, wearing IBM blue and running under OS/2.

The new Ultimedia tools built into OS/2 2.1 run circles around anything in Windows, but until recently they represented only raw potential. With the release of a new multimedia authoring trio, however, IBM is stepping to the forefront of business graphics.

Ultimedia Builder/2 combines a multimedia authoring studio, similar to Multimedia ToolBook, and a business graphics application, in the realm of Harvard Graphics (although it lacks some of the highly evolved ease-of-use features in Harvard Graphics version 2.0). A companion product, Ultimedia Workplace/2, is the best multimedia browser-and-management system I've seen, and Ultimedia Perfect Image/2 is a well-executed scanner and image-editing application.

Ultimedia Builder/2 achieves its flexibility by combining two user interfaces. One uses a visual drag-and-drop structure, and the other resembles a traditional programming or scripting language. While the latter offers more power, you need never deal with it for most business projects. The "stories" you create with Builder can contain images, sound, video, text, animation, and special effects, enabling you to enhance such normally mundane items as E-mail messages and word processing documents in addition to formal presentations and trade show demos. The scripting language, AVA/2 (Audio Visual Authoring), is based on IBM's REXX scripting language. A run-time feature lets you play back your presentations on any OS/2 machine.

RESIZE, COPY, PASTE, AND ROTATE IMAGES with Ultimedia Perfect Image/2. You can capture images from a variety of sources.

When you launch Ultimedia Workplace/2, it finds every file in your system, including text, audio, and video files, and gives you a simple visual index to them. Double-click on a file and it will show or play. Ultimedia Workplace/2 also works with relational databases and even allows you to manage offline materials, an ingredient sorely missing from the multimedia management tools emerging in the Windows world.

Ultimedia Perfect Image/2 provides the final ingredient, allowing you to capture images from a video camera, VCR, video disk, still video camera, or television; edit them; and save them in a variety of formats.

If you haven't yet experienced OS/2 multimedia, you'll discover it's completely different from the sometimes cheesy experience offered by Windows multimedia.

IBM's implementation uses less disk space, plays back at twice the frame size, and doesn't suffer as much signal loss and jerkiness. Because it's OS/2, your spreadsheet can recalculate in the background while your animation plays.

—Joe Abernathy

Ultimedia Software

Three OS/2 multimedia tools to help you build dazzling presentations that will blow away any Windows challengers.

Key Features: REXX scripting language • Visual index of all files • Multiple input sources supported

Pricing: Ultimedia Builder/2 $345, Ultimedia Workplace/2 $345, Ultimedia Perfect Image/2 $175

Availability: Immediate

IBM, 800/426-9402

Full-Screen PC Video

A new standard is bringing digital video up to snuff. Known as MPEG (Motion Picture Experts Group), this video file format lets PCs play full-screen video without losing frames or displaying grainy images.

Among the first products to feature MPEG video playback-only is Sigma Designs' ReelMagic board. While digital video often suffers from low resolution and slow frame rates—particularly on slower 386s—ReelMagic's MPEG hardware handles all video processing to deliver TV quality, regardless of the system.

ReelMagic's on-board chip decompresses MPEG video files, displaying 32,000 colors at resolutions as high as 1024 by 768. The video plays at a smooth 30 frames per second, even when running off single-speed CD ROM drives operating at 150 kilobytes per second, while a built-in sound adapter provides CD-quality audio. ReelMagic costs $449. Sigma Designs, 800/845-8086, 510/770-0100, 510/770-2640 (fax). Reader service no. 707

GORDON STUDER

20 years.

100,000 men.

752 casualties.

Introducing the new HP ScanJet IIcx. Scans done easily for just $1,179.

It's that simple. A click, a pass, an image—ready to be saved or incorporated into any document. With the added efficiency of HP DeskScan software, the HP ScanJet IIcx captures images in seconds. And with a TWAIN interface, you'll never have to leave your document to get them.

One click.

One pass.

One scanner.

But simplicity is just part of the story. The HP ScanJet IIcx provides 256 levels of gray, 24-bit color, and 1600-dpi enhanced resolution (400-dpi optical) for scans that are always detailed, always accurate. HP's AccuPage 2.0 technology aids third-party OCR software in recognizing hard-to-read text, thereby speeding up text scans. And Aldus™ PhotoStyler™ SE software allows you to edit scanned images without the need for additional software. Available as options are an automatic document feeder and our new transparency adapter.

With all this, it's easy to see why we're the number one PC scanner. So call now at 1-800-SCANJET, Ext. 7802† for more information or for the name of your local authorized HP dealer.

HEWLETT® PACKARD

Suggested U.S. list price. †In Canada call 1-800-387-3867, Ext. 7802. Aldus is a trademark of Aldus Corporation in the U.S. and other countries. PhotoStyler is a trademark of U-Lead Systems, Inc. in the U.S. and other countries and is licensed to Aldus Corporation. Pyramid data is estimated. ©1993 Hewlett-Packard Co.

PE 12305

Mwave: Your Digital Office Assistant

TEST DRIVE

The latest generation of PC-based tools for the small office and home office combines computer and telephony technology to create digital office assistants that take your clients' calls, entertain them with music if they're put on hold, and send and receive faxes.

The first of these products are arriving now from companies such as Best Data Products and Spectrum Signal Processing. Based on the Mwave Digital Signal Processor, DSP, and associated chip sets from IBM, they are coprocessor boards and software that take a major step toward winnowing out the number of stand-alone electronic devices in the office and integrating them into the PC.

The move toward integration began over five years ago when the first modem maker added fax to its products, obviating—or at least reducing—the need for a separate fax machine. More recently, voice-ready modem chips have spawned a series of products that turn your PC into a combination telephone answering machine and fax-data messaging center. Now, Mwave-based boards are cresting on the market with additional multimedia capabilities, such as a MIDI and CD ROM interface. They work simultaneously with earlier answering machine and fax-modem technologies to create a sea of possible applications that merge fax, data, voice, and video features.

The key to achieving these multitasking features is the DSPs. These programmable processors can perform a number of specialized functions, removing the burden of these tasks from your PC's processor in the process. Furthermore, they are easy to upgrade. For example, in an Mwave-based board, you'll be able to upgrade your 9600-bps modem to a 14.4-kbps modem just by installing the appropriate software from a disk, instead of having to pull the old modem from your PC and replace it with a new one.

DSPs are already used in a few modems, video boards, and sound boards. But their real utility is in the rapidly evolving communications and video worlds, since they allow users to upgrade their systems just by adding new software.

Digital Receptionist

Applications being developed by Best Data Products and Spectrum Signal Processing will enable Mwave-based boards to act as an advanced answering-machine and message-handling system for the home office.

Since the Mwave DSP acts as a coprocessor, you can run concurrent tasks. For instance, you could have it answer the phone while you review messages, then put callers on hold and entertain them with music, advertisements, and the like from a CD. Other possible applications for Mwave-based products include low-cost video teleconferencing, which sends voice and data simultaneously over the same phone line, and full-duplex speakerphones, which eliminate awkward pauses. And since Mwave boards run independently of the system processor, your PC can chug away performing desktop tasks such as formatting documents and recalculating spreadsheets while the Mwave board handles all your communications, sound, and voice tasks.

The ACE board from Best Data, which should be available by the time you read this, is a 16-bit bus-mastering card. It comes with a 14.4-kbps fax-modem, a digital voice feature, a MIDI synthesizer, 16-bit sound, and a CD ROM connector. It should list for $259. Spectrum Signal Processing had not set a price for its Spectrum Envoy board at this writing. It contains a telephone management system, 14.4-kbps fax-modem, and sound capabilities.

—Bryan Hastings

GORDON STUDER

Mwave Boards

Two Mwave-based boards that promise to take small office communications automation to the next level.

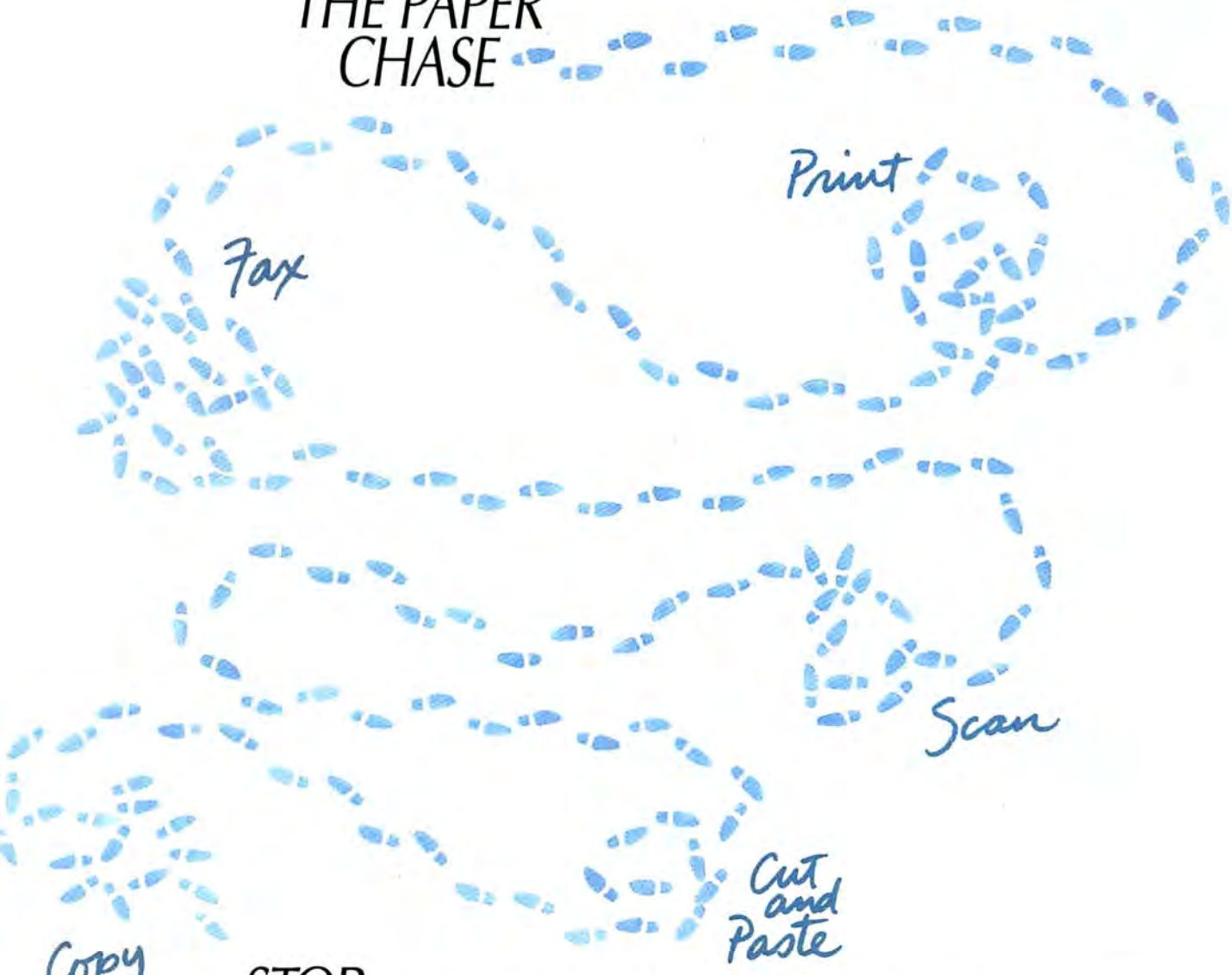
ACE

Key Features: Fax-modem • CD ROM connector • MIDI connector
Pricing: $259
Availability: Immediate
Best Data Products, 800/632-2378, 818/773-9600
Reader service no. 708

Spectrum Envoy

Key Features: Fax-modem • Sound • Telephone management system
Pricing: To be announced
Availability: End of January
Spectrum Signal Processing, 604/421-5422
Reader service no. 709

TO WIN THE PAPER CHASE



STOP CHASING PAPER

DOC•IT INCREASES YOUR PRODUCTIVITY AT WORK.

We've just brought the paper chase to a resounding and refreshing halt with the invention of DOC•IT, the revolutionary desktop document processor that combines a multitude of talents.

With DOC•IT, Okidata has integrated faxing, printing, copying, scanning, cutting and pasting in one unit with a footprint so compact, it takes up just a corner of your desk. Incorporating graphics capability compatible with Windows™ and most major software, DOC•IT lets you create and communicate finished presentation-quality documents–complete with visuals–without having to get out of your chair.

No more standing in line. Everything sits on the corner of your desk: simple, handy, productive and private; and incredibly easy to use. If DOC•IT looks good to you on paper, come see it in action at your nearby authorized Okidata DOC•IT dealer. ***TO RECEIVE YOUR OWN ON-SCREEN DEMO DISK, OR THE NAME OF A DEALER NEAR YOU, CALL 1-800-OKI-TEAM, EXT. 267.***

Circle 140 on reader service card

THE SMARTEST CORNER OF YOUR DESK.
DOC•IT™ BY OKIDATA®
a Division of Oki America, Inc.

DOC•IT T.M., Okidata Reg. T.M. M.D. OKI Electric Industry Company, Ltd. Windows T.M. Microsoft Corp. "THE END OF THE PAPER CHASE" Reg. T.M. Micro Dynamics, Ltd., Silver Spring, MD.

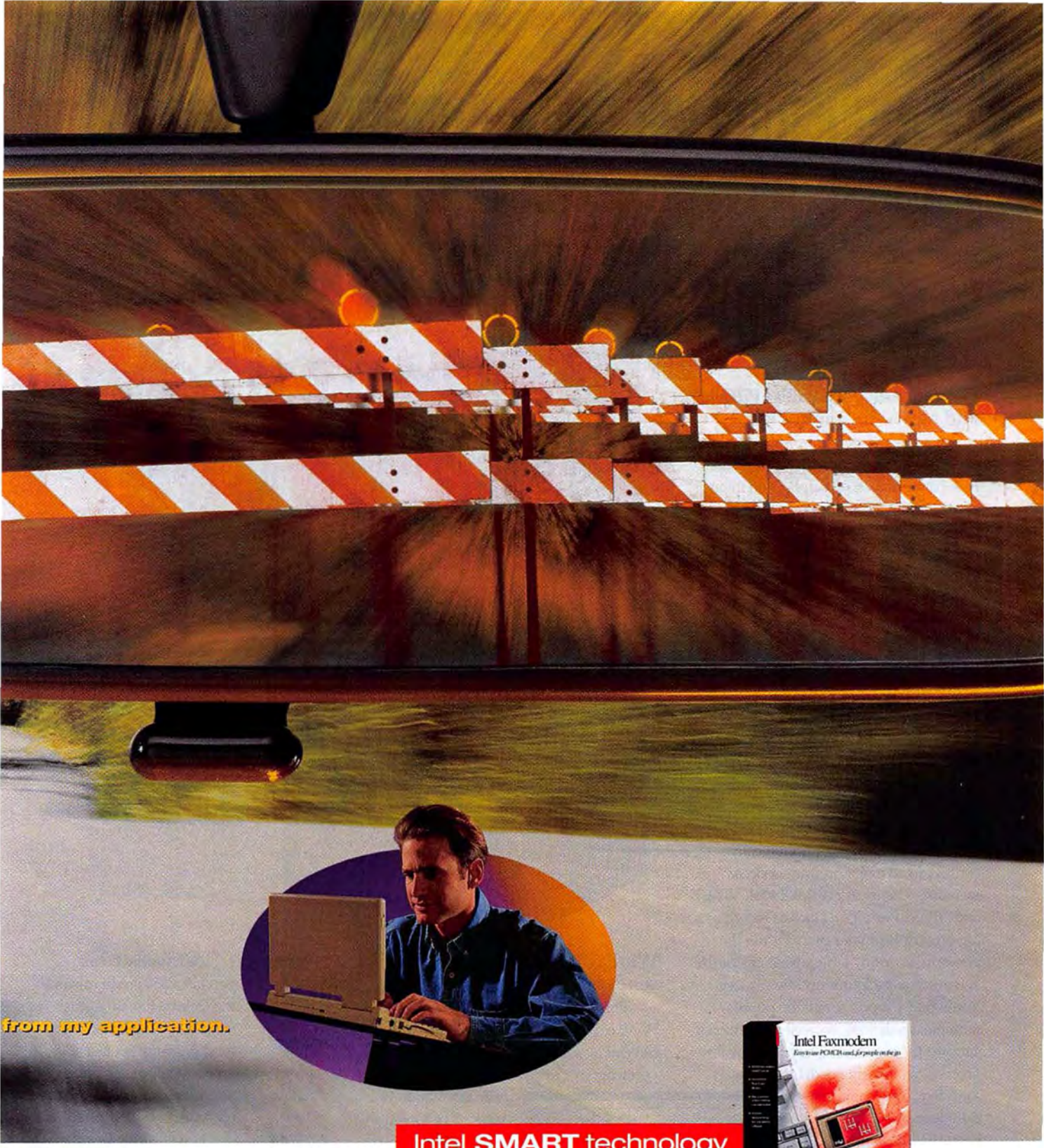
Vroooom! When you're on the road, there's no time to slow down for faxmodem hassles. And with Intel PCMCIA cards, you'll go from zero to faxing in no time.

Just insert the PCMCIA card into any Type II or Type III slot. Unlike other cards, Intel faxmodem cards require no powering down, no reconfiguring, and no com ports to set.

Applications won't bring you to a screeching halt either. The card launches and configures fax and communications software so you can fax without annoying extra steps.

Of course the card is made for the road. With a built-in

©1993 Intel Corporation. *Other brands and names are trademarks of their respective owners.



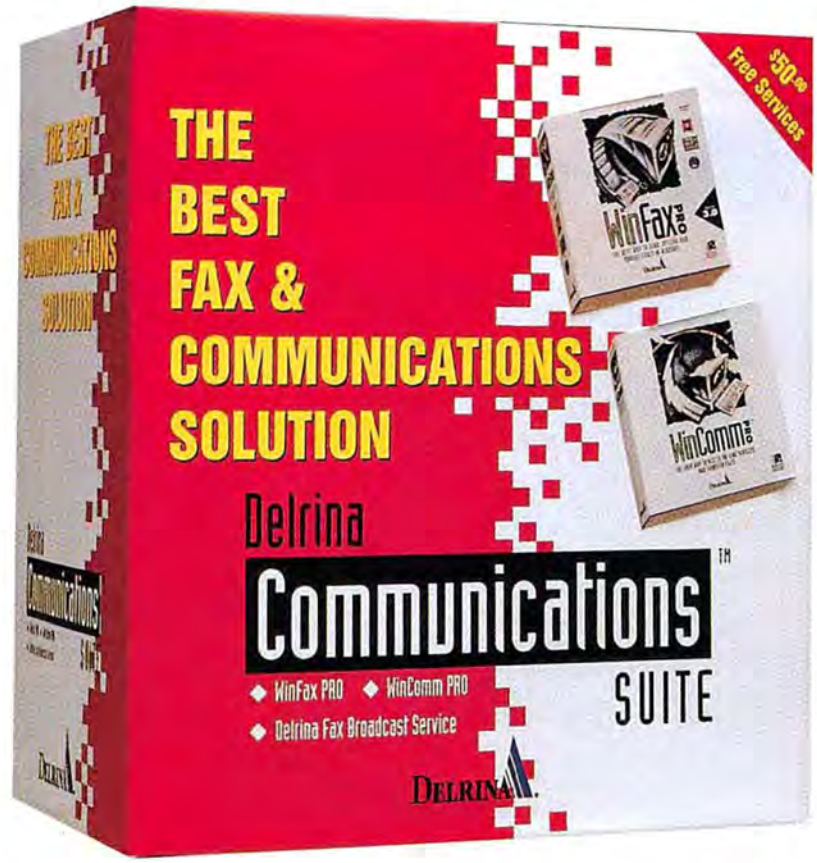
phone line adapter. Sleep features to preserve battery power. On-line manuals. And three data/fax speeds on the industry's most durable PCMCIA card.

So leave your faxmodem obstacles in the dust. Just call 1-800-538-3373, ext. 1015 or dial Intel's automated FaxBack® service at 1-800-525-3019 and ask for document #9713. Then go see your reseller. And get ready to really hit the gas.

intel®

Circle 109 on reader service card

Introducing Delrina Communications Suite. At last, powerful fax and communications software that work together.



Get a suite deal on WinFax PRO™ and new WinComm PRO™

Now you can get the world's best-selling fax software together with a powerful new communications application in one economical package: New Delrina Communications Suite™.

Together, WinFax PRO and new WinComm PRO set a new standard for ease-of-use and integration. In fact, for the first time you'll be able to run both fax and data communications software without the hassle of serial port conflicts.

New WinComm PRO - the easy way to access on-line services and transfer files

With WinComm PRO's friendly graphical interface and intuitive icons, access to advanced communications is easier than ever. Lots of pre-defined scripts are included to automatically connect to all major on-line services, including CompuServe, MCI Mail, AT&T and GEnie. Plus, it's a cinch to record log-on scripts of your own. Or use the powerful scripting language to customize and automate all your on-line sessions. You'll find support for all the popular terminal emulations. As well as additional support for just about every file transfer protocol you might need, including Xmodem, Ymodem, Zmodem and Kermit. Plus on-line virus protection.

Only WinComm PRO gives you power and flexibility in data communications, with the same ease-of-use that made WinFax PRO number one in PC faxing.

Like award-winning WinFax PRO, new WinComm PRO gives you push button access to its powerful features.

WinFax PRO - the best way to send, receive and manage faxes

Plus, you get Delrina's award-winning WinFax PRO. With over 2 million copies of WinFax sold worldwide, we think you'll agree it's the best way to send faxes from any Windows application. It even lets you receive faxes in the background, organize your faxes with a detailed log, design your own cover sheets, and convert faxes into word processing documents with OCR.

PC Computing USABILITY APPROVED 1993

1993 ANNUAL WINDOWS MAGAZINE WIN AWARD 1993

PC Computing MVP FINALIST 1992

As a special bonus, you get a $50 credit toward the Delrina Fax Broadcast™ Service — which lets you send the same fax to a group of people using our phone lines instead of tying up yours.

Best of all, the Delrina Communications Suite is yours for about the same price as the leading communications software alone.

To order, or find out more about upgrading from WinFax PRO or WinFax LITE™, call today.

DELRINA®
1-800-268-6082

Delrina, WinFax PRO, WinFax LITE, WinComm PRO, Delrina Communications Suite and Delrina Fax Broadcast are trademarks of Delrina (Canada) Corporation. All other product names are copyright and registered trademarks/tradenames of their respective owners. © 1993 Delrina (Canada) Corporation. All rights reserved.

AST Offers More Multimedia for Your Money

AST Advantage Adventure series

These affordable multimedia PCs include double-speed CD ROM drives and 16-bit stereo sound cards.

AST Research Inc.
800/876-4278,
714/727-4141,
714/727-9355 (fax)
List price: starts at less than $2000
Reader service no. 654

Everybody's selling multimedia systems. But what do you get? A slow-as-molasses single-speed CD ROM drive or a double-speed drive that plays motion video? A poor-quality 8-bit sound card or a 16-bit card with CD-quality audio? And what about the monitor, speakers, and microphone?

AST's new Advantage Adventure PCs, targeted at small-office and home users, are inexpensive multimedia systems. Complying with the Multimedia PC Marketing Council's MPC Level 2 multimedia specification, each Adventure model offers a double-speed (300-kilobytes-per-second data transfer rate) CD ROM drive that does an adequate job of playing video clips. It includes a 16-bit stereo sound card, external speakers, a microphone, and local bus video with 1MB of video RAM that's expandable to 2MB on the 66-MHz 486-DX2 model.

Easy Installation

However, the specs tell only part of the story. AST makes it easy to get your multimedia Adventure running, thanks to an illustrated Quick Start chart that guides you step-by-step through installation. Turn on the system, and Windows loads automatically. Preinstalled CD ROM titles include Microsoft's Encarta and Multimedia Works, Broderbund's Where in the World Is Carmen Sandiego?, and Kodak's Photo CD software. To use Encarta, for instance, you simply load the Encarta CD and click the Encarta icon.

The Advantage Adventure comes in a variety of configurations. The unit we tested featured a 33-MHz 486SX processor, a 256K secondary cache, 8MB of RAM, a 210MB hard drive, and a 3½-inch floppy drive. With a 14-inch color monitor and all the multimedia goodies, this system should sell for around $2000, according to the company.

Sound and Video

As configured, our Adventure 486SX/33 was fast enough for the multimedia games and education software that came with it. The Creative Labs Sound-Blaster 16 audio card and Labtec CS-150 speakers produced high-fidelity stereo output. The double-speed CD ROM drive, also from Creative Labs, did a respectable job of playing Video for Windows clips. The drive's motorized tray made loading CDs easy, and its stereo phone jack was convenient for connecting headphones or an earphone to the drive.

Although our Adventure 486SX/33 was capable of displaying resolutions up to 1024 by 768 pixels with 256 colors, we found the 14-inch monitor too small to show anything other than standard VGA—unless you enjoy viewing your display with a magnifying glass. To take full advantage of the multimedia experience, we suggest a 15-inch or larger monitor.

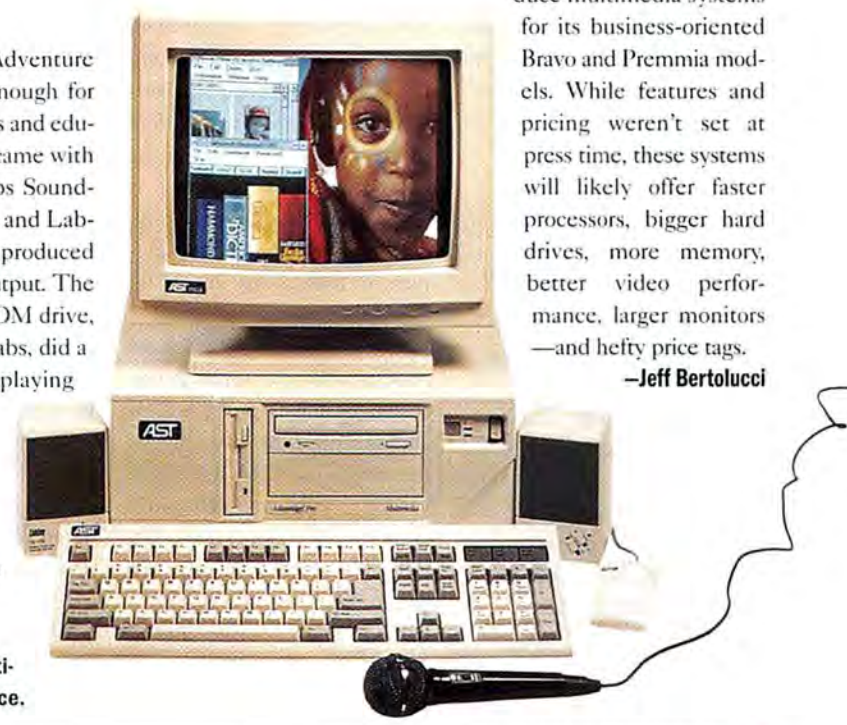
Fax, Data, and More

Each Adventure includes an internal fax-modem and preloaded Prodigy, America Online, and Delrina WinFax software. The fax-modem sends and receives data files at 2400 bits per second (bps); it sends faxes at 9600 bps and receives them at 4800 bps. Since the machine ships without any system software disks, you also get AST's Disk Utility, which pops up every time you load Windows until you break down and agree to copy your system's software to floppy disk.

For expansion, each Adventure desktop unit offers two open ISA bus slots and two open drive bays. If you need more room for add-on boards, note that the Adventure 486-DX2 minitower comes with four open ISA slots. All AST Advantage products include lifetime toll-free technical support and one year of free on-site service.

While the Advantage Adventure line is fine for playing low-end multimedia titles like CD-based encyclopedias, games, and education software, a corporate developer building applications that use sound, animation, and video will likely need a more powerful computer. For this reason, AST plans to introduce multimedia systems for its business-oriented Bravo and Premmia models. While features and pricing weren't set at press time, these systems will likely offer faster processors, bigger hard drives, more memory, better video performance, larger monitors—and hefty price tags.

—Jeff Bertolucci



AST'S ADVENTURE 486SX/33 brings multimedia to the home office.

Notebook Has Tiny CD ROM Drive

PANASONIC'S 6.4-POUND CF-V21P is the first notebook to offer an optional 3½-inch CD ROM drive.

Panasonic's new 6.4-pound multimedia note boasts a 10.4-inch active-matrix color display and an optional 3½-inch CD ROM drive, an industry first.

The CF-V21P notebook features a new breed of CD ROM drive that reads 3½-inch disks instead of the standard 5¼-inch disks. This smaller drive weighs just 0.7 pounds. Adding a CD ROM drive to other notebooks can almost double a unit's weight. For example, adding a multimedia docking station, which includes a CD ROM drive and speakers, to IBM's ThinkPad 750C brings the unit's total weight to an arm-wrenching 13 pounds.

Unfortunately, you can't read 5¼-inch disks in this drive, so most popular CDs won't work in it. Hence, the CF-V21P equipped with the CD ROM drive will be practical only for people with access to CD recording devices or for corporate departments dedicated to creating these custom disks. (A standard CD recording device can write to these small disks. Likewise, 3½-inch disks can be read by 5¼-inch drives.)

Another drawback is that the 3½-inch disks hold only 180MB, compared with 650MB on the 5¼-inch disks.

On the plus side, the smaller CD ROM drive offers solid performance. It provides a fast data access time of 210ms and a data transfer rate of 300K per second, the rate recommended by the Multimedia PC Marketing Council's MPC Level 2 multimedia guidelines. The drive fits into a slot normally reserved for the notebook's floppy drive. (This slot can also house a second battery.) On a preproduction unit, it was easy to replace the floppy drive with the CD ROM drive: You flip a lever beneath the <Space> bar, and the drive pops out.

The active-matrix color notebook costs $4199, plus $499 for the CD ROM drive. A monochrome model, which weighs 5.7 pounds, costs $2599. A pen-input LCD model weighs 5.7 pounds and costs $2999. All use a 25-MHz 486SX processor. They include 4MB of RAM upgradable to 20MB, a 120MB hard drive, a trackball, and two Type II PCMCIA slots. To complete your multimedia machine, you'll need a PCMCIA sound card and speakers.

The monochrome note runs 2½ to 7½ hours on nickel–metal-hydride batteries; the color unit about 1½ to 4½ hours, the vendor claims.

–Laurianne McLaughlin

Panasonic CF-V21P notebook

A 6.4-pound notebook with a 10.4-inch active-matrix color display and an optional 3½-inch CD ROM drive.
Panasonic Communications & Systems Co.
800/742-8086
List price: active-matrix $4199, monochrome $2599, with pen LCD $2999; CD ROM drive $499
Reader service no. 655

It's a Tablet! No, It's a Notebook!

Daring to tread in the dark and dangerous forest of handwriting recognition, Compaq's innovative Concerto notebook may actually be charting a safe course. Rather than marketing the machine for its pen capabilities, Compaq is touting the Concerto as a fully functional notebook that happens to have a pen and a detachable keyboard.

The Concerto, with a base price of $2499, is Compaq's first computer to include PCMCIA, and it features the nicest implementation of PCMCIA we've yet seen, with intelligent plug-and-play for more than 140 PCMCIA cards. Our unit had no trouble sensing a SunDisk flash memory device and a Megahertz XJack Modem. To extend battery life, the Concerto can shut off power to its two Type II PCMCIA slots.

The electronic pen works with Microsoft Windows for Pen Computing. It's highly effective at replacing the pointing device found on many of today's notebooks. Less effective is the handwriting recognition, which we found to be inaccurate and slow when used with InkWare NoteTaker and PenPower for Excel, two applications that are bundled with the Concerto.

With a 9½-inch MaxLight display, the Concerto includes either an Intel 486SL-25 or 486SL-33 processor. You can drive the internal screen and an external monitor in 256 colors at 640 by 480 resolution. The 25-MHz Concerto comes with a 120MB or 250MB hard drive; the 33-MHz unit has a 250MB drive. The standard 4MB of RAM is expandable to 20MB. A 3½-inch floppy drive is included. Weighing 6.5 pounds with the keyboard and 5.2 pounds in its tablet mode, the Concerto runs 3½ to 4 hours with standard power management options enabled, the vendor claims.

–Joe Abernathy

Compaq Concerto notebook

An innovative portable computer with plug-and-play PCMCIA and pen enhancements.
Compaq Computer
800/345-1518
Estimated street price: beginning at $2499
Reader service no. 656

Free Tax Software.

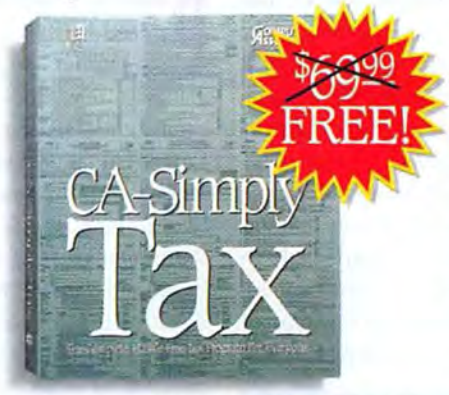
(The Ultimate Loophole.)

From Now Until April 15th, Anyone Who Asks Will Receive This $69.99 Tax Software For FREE!

From The People Who Brought You Free Money—Introducing CA-Simply Tax.

First, it was free money. Now, it's a free tax break. For a limited time, CA is offering you our new tax software, CA-Simply Tax,™ for free.*

"CA-Simply Tax interviews you—just like a tax pro. Then it does the work for you. You just print the forms, sign and mail. Or better yet, file electronically."



The Complete, Hassle-Free Tax Program For Everyone.

CA-Simply Tax interviews you just like a real tax pro. After you answer the questions, the software does the work for you.

CA-Simply Tax even helps you get organized. A built-in tax preparation checklist makes sure you bring everything to the table to maximize your deductions. So you won't pay more than you have to. A Tax Deadline Alarm even warns you of upcoming deadlines for making estimated tax payments.

Completing more than one tax return? No problem. CA-Simply Tax will print them all on your laser or dot matrix printer.

There are lots of extra features, too. Like a built-in Tax Planner to help you with next year's projections. And a "What If" which allows you to assess different tax scenarios to determine which works best for you. All of which help you save money and take all the deductions that are coming to you.

MICROSOFT WINDOWS. COMPATIBLE

Programs for state taxes are also available.

Preparing your 1040 has never been simpler. Or less time consuming.

But don't take our word for it!

Order your free copy of CA-Simply Tax software today.

For A FREE Copy Of CA-Simply Tax, Call Today!
1-800-7-FREE-TAX
(1-800-737-3382), Dept. T3701.

COMPUTER ASSOCIATES®
Software superior by design.

CA-Simply Tax™

*There is a nonrefundable $9.95 shipping and handling charge. (Allow up to 3 weeks for delivery.) Have your credit card ready: Visa, MasterCard, AmEx and Discover accepted. Only available in the US. Windows 3.1: requires 2Mb of RAM (4 recommended) and 5.5Mb of hard disk space. DOS 3.0: 640K (minimum 500K of free RAM required) or greater, minimum 3.5Mb of free hard disk required. Offer valid through April 15, 1994. © Computer Associates International, Inc. Islandia, NY 11788-7000.
All product names referenced herein are trademarks of their respective companies.

Circle 42 on reader service card

Continued on page 98

Color Ink Jets for the Office, Home, and Road

Hewlett-Packard DeskJet 310

Color ink jet printer for the office and the road.
Hewlett-Packard
800/752-0900, 208/396-2551
List price: $379, with sheet feeder $455, color option $49
Reader service no. 657

Canon BJC-600

High-quality color at a reasonable price.
Canon Computer Systems Inc.
800/848-4123
List price: $719
Reader service no. 658

Color ink jet printers are hot. The reason: They offer good output quality for text as well as graphics, at an affordable price. Two recent examples on the market: the Hewlett-Packard DeskJet 310 and the Canon BJC-600.

Positioned as a "companion" printer for portable PCs, the HP DeskJet 310 is designed for use at the office and on the road. In its $379 base configuration, the 310 is a lightweight, 300-dpi, 3-ppm printer. With the $49 color kit, you get a portable color printer that's functionally comparable to HP's popular DeskJet 500C.

The 310 uses a black ink cartridge to print text or a three-color cartridge for color output (blacks printed with the three-color cartridge look a little green). An optional sheet feeder can hold up to 60 sheets of letter-size stock. While the printer can accommodate transparencies and labels, it can't handle envelopes.

If you hit the road with the 310, it'll add 7 pounds (including the sheet feeder) to your load. The printer also has power management features: After 2 minutes of inactivity it enters sleep mode; after 10 minutes of sleep it shuts down. The nickel-cadmium battery recharges whenever plugged in, and the printer has a "drain" mode to alleviate the dreaded memory effect common to this type of battery, which errantly indicates that it is out of power.

The Canon BJC-600 offers good color output at an extremely competitive price. It's aimed at small-office/home-office buyers who want a single printer to produce professional-quality blacks for text and color for charts and graphs.

The BJC-600 produces 360-dpi output from four ink cartridges (cyan, magenta, yellow, and black). The separate black cartridge means that blacks on color pages are pure, not composite. Listing at just $719, the BJC-600 costs exactly the same as the comparable HP DeskJet 550C. (The less expensive DeskJet 500C uses three color cartridges, not four.)

Canon says its new ink dries 100 times faster than conventional inks. In draft mode the BJC-600 produces roughly 3 ppm; in high-quality mode it slows to about 2 ppm. It handles both letter- and legal-size paper (100 sheets at a time) as well as envelopes, transparencies, and adhesive labels.

—Dan Miller

PRINTER COMPANION: HP'S DESKJET 310 weighs 7 pounds and provides 300-dpi color printing on the road.

Laser Printers Get Even Smaller

Panasonic KX-P4400 and KX-P5400

These new laser printers offer upgrade options and smaller footprints unmatched by popular competing products.
Panasonic Communications & Systems Co.
800/742-8086
List price: KX-P4400 $649, KX-P5400 $999
Reader service no. 659

Panasonic's two new low-priced LED laser printers are smaller and more upgradable than their leading competitors, Hewlett-Packard's LaserJet 4L and Okidata's OL-400e. Both Panasonic models offer a 4-ppm engine and 300-dpi resolution. The $649 KX-P4400 and the $999 KX-P5400 sit on their sides and take up about as much desk space as a small loaf of bread. By comparison, the 4L and OL400e need about three times the space.

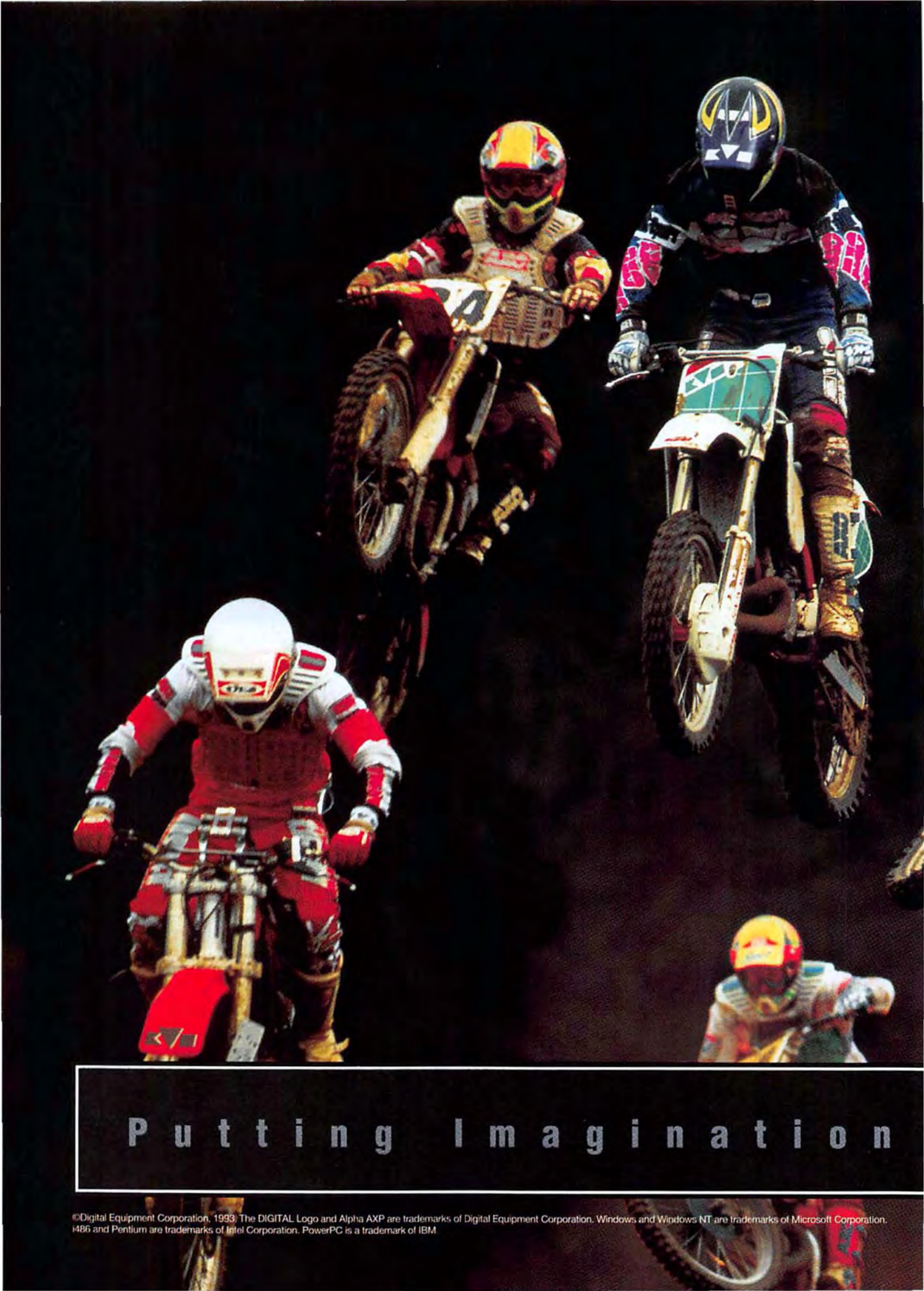
The Panasonics provide more upgrade options than their competitors. For $479 you can upgrade the PCL 4–equipped KX-P4400 to PostScript Level 2. And you can upgrade the PostScript-capable KX-P5400 (and the upgraded P4400) with an add-on module ($299) that lets you send faxes from your PC and print received faxes on plain paper. The P5400 also lets you add a serial port.

Like the competition, both Panasonics offer a 100-sheet paper tray. The P4400 includes 512K of RAM upgradable to 4.5MB, and the P5400 has 2MB upgradable to 4MB. The P4400 comes with 28 internal bit-mapped fonts. When equipped with PostScript, these units offer 17 scalable Adobe Type 1 fonts. The fax option adds another 18 Type 1 fonts.

On the downside, the Panasonics don't offer the 4L's Resolution Enhancement technology or the OL400e's RISC processor, which provides fast processing of complex graphics.

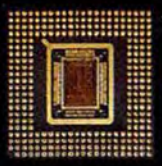
—Randy Ross

You Can Play Around With Windows NT On Another Microprocessor.

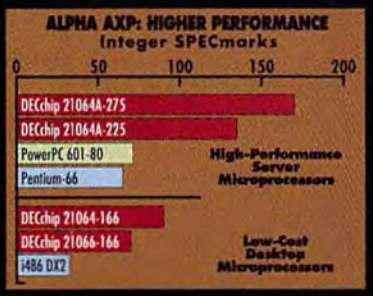


©Digital Equipment Corporation, 1993. The DIGITAL Logo and Alpha AXP are trademarks of Digital Equipment Corporation. Windows and Windows NT are trademarks of Microsoft Corporation. i486 and Pentium are trademarks of Intel Corporation. PowerPC is a trademark of IBM.

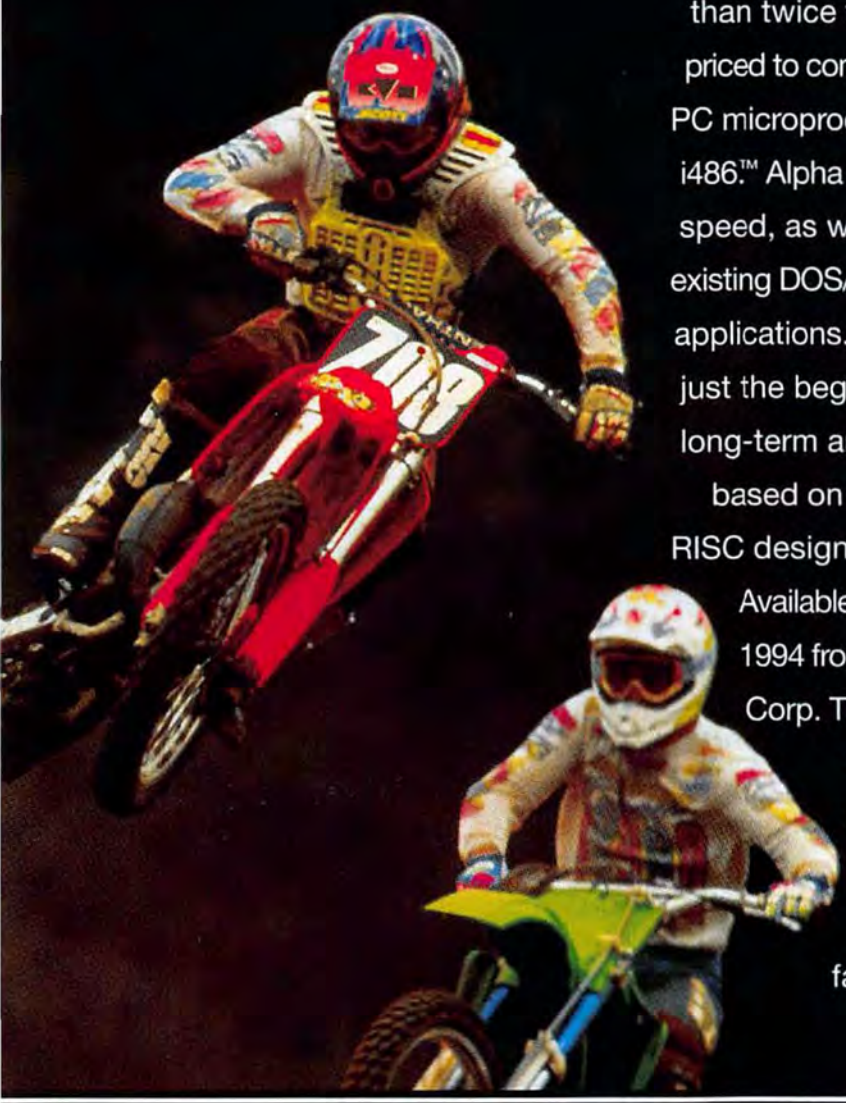
Now Imagine Letting NT Fly On Alpha AXP.



You're going to blaze some new trails with the mainframe power of Windows NT.™ Don't compromise it. Run it on the fastest vehicle you can get—an Alpha AXP™ microprocessor. Choose from a family of fast server microprocessors with performance as high as 170 SPECInt, more than twice that of Pentium™ or PowerPC™—and priced to compete. Or choose from low-cost desktop PC microprocessors with prices that start below an i486.™ Alpha AXP runs Windows NT with thundering speed, as well as your existing DOS/Windows™ applications. And that's just the beginning of a long-term architecture based on a scalable RISC design and standards like the PCI local bus.



Available to any PC maker— from us now, and in 1994 from our second source Mitsubishi Electric Corp. The decision with Windows NT is simple. On other microprocessors, it runs. On Alpha AXP, it flies. Which way would you rather cover new ground? Call your PC maker and ask about the Alpha AXP family. Or call us at 1-800-332-2717—and kick start your future.



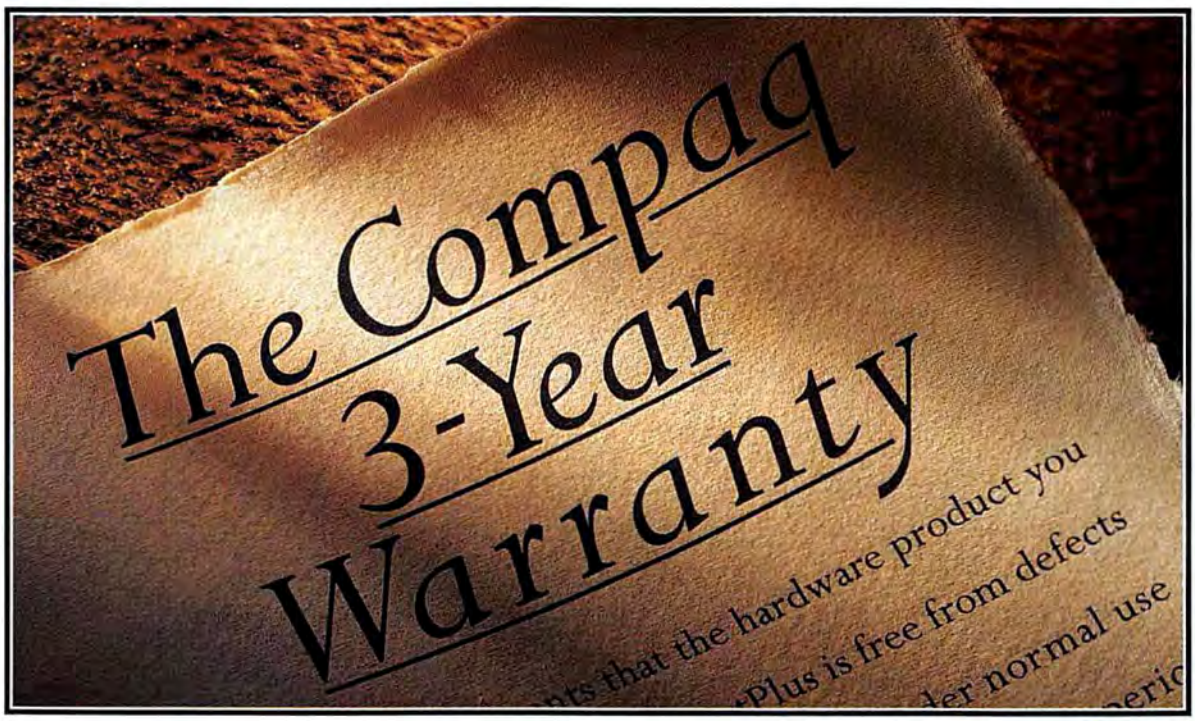
To Work

digital™

WHY BUY COMPUTER WH NEW PRICES

All our PCs are backed by the COMPAQ® free 3-year warranty†—the first such warranty in the industry. We can offer this kind of long-term guarantee because of our quality and testing standards. Prices include COMPAQ Monitors. Call for details on other COMPAQ desktops and notebooks, as well as printers.

COMPAQ ProLinea™ 4/33s
*33-MHz 486SX, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor. Performance with extraordinary affordability. Or lease for $53 per month.**



†Restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. *Leasing is provided by GE Capital Services for a term of 36 months, and is subject to approved credit and certain terms and conditions. Call for details. **Requires a 1024 Color Monitor. ©1993 Compaq Computer Corporation. All rights reserved. Printed in the USA. Compaq, the COMPAQ logo, LTE and DESKPRO are Registered with U.S. Patent and Trademark Office. Contura and ProLinea are trademarks of Compaq Computer Corporation. COMPAQ DirectPlus is a service mark of

ANY OTHER EN COMPAQ HAS LIKE THESE?

COMPAQ ProLinea 4/25s
*25-MHz 486SX, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor. Great for everyday business applications. Lease for $49 per month.**

COMPAQ ProLinea 4/33
*33-MHz 486DX, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor. Designed for more advanced applications. Lease for $63 per month.**

COMPAQ ProLinea 4/66
*66-MHz 486DX2, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor. For high performance at an affordable price. Lease for $75 per month.**

ProLinea Features

3½" 1.44-MB diskette drive • 1024 x 768 local bus video graphics with 1-MB VRAM in up to 256 colors (on 486 models) • 3 expansion slots • 3 internal storage device positions • Security features • COMPAQ Color Monitor, preinstalled MS-DOS 6 and Microsoft Windows 3.1 and a COMPAQ Mouse.

DESKPRO/i Features

*3½" 1.44-MB diskette drive • Integrated QVision Graphics displays up to 256 colors at 1024 x 768 with 512-KB VRAM option** • 3 expansion slots • 3 internal storage device positions • Security features • Business Audio • COMPAQ Color Monitor, preinstalled MS-DOS® 6 and Microsoft® Windows™ 3.1 and a COMPAQ Mouse.*

COMPAQ DESKPRO 4/25is
*25-MHz 486SX, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor. Delivers fast, high-resolution graphics in Windows. Lease for $51 per month.**

COMPAQ DESKPRO 4/33i
*33-MHz 486DX, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor. For even faster performance in a Windows environment. Lease for $64 per month.**

LTE Lite Features

3½" 1.44-MB diskette drive • Power conservation and security features • Auxiliary battery • AC Adapter • MS-DOS 6 and Microsoft Windows Preinstalled • EZ Help On-Line Library • Slipcase • Integrated Trackball and an Expansion Base Connector.

Contura Features

3½" 1.44-MB diskette drive • Power conservation and security features • Battery Pack • AC Adapter • Preinstalled MS-DOS 6, Microsoft Windows 3.1 and EZ Help On-Line Library and a COMPAQ Trackball.

COMPAQ Contura™ 4/25
*25-MHz 486SL, 4-MB RAM, 120-MB hard drive, monochrome VGA display, 6.2 lbs. Upgradeable to Active Matrix Color Display. Lease for $72 per month.**

COMPAQ LTE® Lite 4/25
25-MHz 486 SL, 4-MB RAM, 120-MB hard drive, monochrome VGA display, 6.2 lbs. A full-featured notebook with desktop capabilities. ***$2149. Or lease for $77 per month.****

COMPAQ DirectPlus

1-800-888-5807

Ask for our new free catalog.

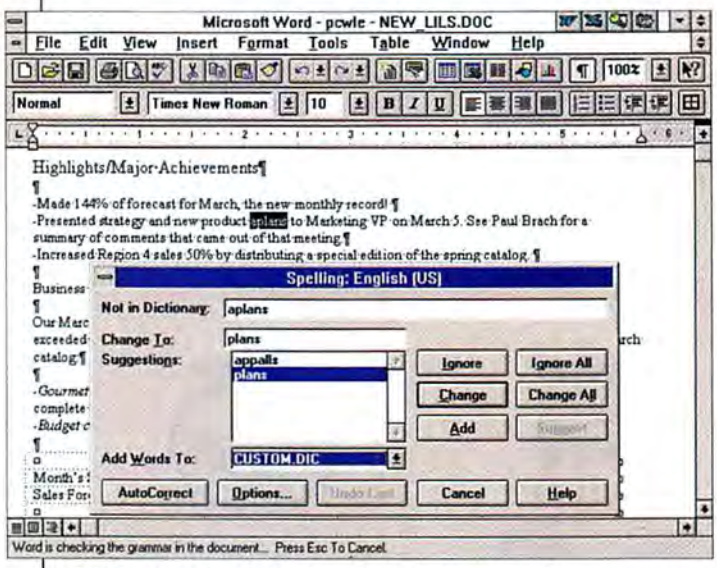
Compaq Computer Corporation. Products, prices and programs are subject to change without notice. All products are trademarks or registered trademarks of their respective companies. Microsoft and MS-DOS are registered trademarks, and Windows is a trademark of Microsoft Corporation. The Intel Inside Logo is a registered trademark of Intel Corporation. Offer available in the U.S. only.

Circle 83 on reader service card

Continued from page 92

The Integrated Application: Working in the Office or the Suite

Vendors started selling software suites under the simple marketing concept of "more for less." But now they've taken the next step: They've actually made suite applications more valuable as a package than as individual programs, through timesaving integration features and consistent menus, commands, and icons. The latest software suites, Lotus SmartSuite 2.1 and Microsoft Office 4, offer economical solutions and a high level of integration.



MICROSOFT OFFICE 4 features the latest versions of the company's most popular business applications, including Word 6.0.

Both suites provide a word processor, a spreadsheet, and a presentation graphics program. The package you choose will likely depend on which vendor's applications you prefer. However, if getting more software for your buck is your prime consideration, SmartSuite offers a database and a personal information manager (PIM) for just a few dollars more than Microsoft's product. Office, on the other hand, gives you a single-user E-mail license not found in SmartSuite, plus broader cross-application integration due to its use of Object Linking and Embedding (OLE) 2.0. Both suites offer fairly uniform application interfaces, making the programs they contain easier to learn and use.

SmartSuite

In SmartSuite 2.1, Lotus has added a database program, Approach 2.1, and removed the single-user cc:Mail license. Approach is solid and easy to use and works well with the other applications in the suite. For example, it imports 1-2-3 release 4.0 files directly. Approach also supports Microsoft's Open Database Connectivity (ODBC) standard for data compatibility, promising access to most data formats.

Lotus SmartSuite still includes 1-2-3 release 4.0, Ami Pro 3.01, Organizer 1.1, and Freelance Graphics 2.01. The five-program suite retails for $795; it costs $595 for users of Lotus desktop applications and some competing applications.

Lotus didn't have to improve the suite's appearance, because consistency across applications was already good. As for integration, Lotus's Working Together Bonus Pack, an included set of tools, provides helpful shortcuts for working with multiple applications. For example, the Collect and Copy tool lets you drop a 1-2-3 chart into a Freelance presentation, where it's automatically converted to match the presentation's style.

Office

Microsoft has made significant improvements to Office. The product includes Excel 5.0, Word 6.0, PowerPoint 3.0, and an individual-user license for Microsoft Mail. Office retails for $750, $259 for current users of any of the Office apps, and $299 for users of some competing products. To get Microsoft's database application, Access 1.1, you'll need Microsoft Office Professional, which is $899.

The most striking thing about Office is the improved consistency of interfaces. Whether you're in Word, Excel, or PowerPoint, you'll find similar menus, commands, and icons. But the greatest strides made by Microsoft are on the integration front, where it's added OLE 2.0 to Excel and Word. (PowerPoint 4.0, expected in early 1994, will add OLE 2.0 compliance and is free to Office buyers.)

OLE 2.0–enabled applications have two principal advantages. First, OLE 2.0 technology allows you to drag and drop objects, say a chart or a block of text, between OLE 2.0–enabled applications. Second, OLE 2.0 lets you edit an object outside the application where it was created. For example, you can drag and drop an Excel chart into a Word document, then double-click the chart to invoke the graphics tools used by Excel. Your Word menus and icons will change to Excel's charting tools, and you'll be able to edit the chart right then and there from within your document. Click on the document text, and the Word menus and icons are restored. Meanwhile, the data links between the Excel chart in the Word document and the spreadsheet data used to create it are maintained and updated automatically.

Microsoft has also made advances in automating your work, thanks to a set of utilities called IntelliSense tools that speed up work. Finally, new Wizards (dialog boxes with help inside) pop up when the software observes you doing something the long way.

—Laurianne McLaughlin

Lotus SmartSuite 2.1

WINDOWS **Lotus adds an easy-to-use database, Approach, to its already strong suite.**

Lotus Development Corp.
617/577-8500
List price: $795
Reader service no. 642

Microsoft Office 4

WINDOWS **Microsoft improves interface consistency and adds OLE 2.0 compliance to new versions of Excel and Word.**

Microsoft Corp.
206/882-8080
List price: $750
Reader service no. 643

YOU COULD PUT ALL THIS TOGETHER FOR $3,023. OR LET US DO IT AND SAVE $524.

The Compaq LTE Lite Solution Paq

Includes a Compaq LTE Lite 4/25 486 Notebook, 120MB Hard Drive, a 2,400-bps Data+Fax Modem with WinFax Lite software, AC Adapter, built-in auxiliary battery, NiCad Smart Pack, carrying case, preinstalled MS-DOS 6, Microsoft Windows 3.1, WordPerfect for Windows, Quattro Pro for Windows V.5.0, The Norton pcANYWHERE for Windows V.1.0, Lotus Organizer for Windows R.1.0., and CompuServe.‡

This is definitely not a do-it-yourself ad.

For a limited time, Compaq will deliver the acclaimed LTE® Lite 4/25 notebook right to your door, packaged with everything you need to become an instantly more productive individual. You'll save time setting up your system and loading software, not to mention over five hundred dollars.

This special Solution Paq℠ offers an LTE Lite 4/25 Model 120 notebook preinstalled with WordPerfect for Windows,™ Quattro Pro for Windows, Lotus Organizer, and The Norton pcANYWHERE for Windows. You also get a Data+Fax Modem, a NiCad Smart Pack Battery, plus a carrying case.

LTE Lite 4/25 Features

25-MHz 486SL ◆ 4-MB RAM ◆ 120-MB Hard Drive ◆ 9.5" Monochrome VGA Display ◆ 3½" 1.44-MB diskette drive ◆ Power conservation and security features ◆ Preinstalled MS-DOS® 6 & Microsoft® Windows 3.1 ◆ Auxiliary Battery ◆ AC Adapter ◆ EZ Help On-Line Library ◆ Integrated Trackball ◆ Expansion Base Connector

It's set up and ready to run the moment you open the box. And by simply sliding the LTE Lite notebook into the optional Compaq Desktop Expansion Base, you have a full-function desktop computer. You also get unsurpassed Compaq quality, including a free three-year warranty† and 24-hour hotline support.

There's never been a better value on the notebook you really want. So don't wait until they're all gone. Call to order your LTE Lite Solution Paq today.

intel inside

True, you won't get the gratification of assembling it. But with $524,** you can buy a lot of model airplanes.

COMPAQ DirectPlus

1-800-888-5814

Mon-Fri 7-7 (Sat 10-4) CST
Ask for our new free catalog.

*Leasing is provided by GE Capital Services for a term of 36 months, and is subject to approved credit and certain terms and conditions. Call for details. **Savings based on individual prices. †Restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. ‡CompuServe preinstalled with 30-day free trial membership. ©1993 Compaq Computer Corporation. All rights reserved. Compaq, the Compaq Logo and LTE are Registered U.S. Patent and Trademark Office. Compaq DirectPlus and Solution Paq are service marks of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation. The Intel Logo is a registered trademark of Intel Corporation. Offer available in the U.S. only.

Circle 83 on reader service card

THERE'S A UNIQUE LINK

Austin 425-130

- 486SX-25 Processor
- 4 MB RAM
- 130 MB Hard Drive
- Monochrome Display

$1,599 Lease $60/month*

Austin 425C-130

- 486SX-25 Processor
- 4 MB RAM
- 130 MB Hard Drive
- Dual Scan Color Display

$2,199 Lease $82/month*

OUR CUSTOMERS HAVE AND JUST CAN'T GET

Austin has developed a unique philosophy regarding notebook computers that serves our customers well: You don't need to be rich to be powerful.

Our notebooks are a perfect demonstration. At price/performance levels known to drop jaws throughout the industry, these compact machines have everything except an inflated bottom line.

Consider: a 32-bit Local Bus Video with 1 MB VRAM and Windows™ Accelerator to send you speeding. Two Type II or one Type III PCMCIA slots for communications, storage, or multimedia options. Simultaneous CRT and LCD displays for impressive presentations to anyone,

PC MAGAZINE EDITORS' CHOICE

PC MAGAZINE READERS' CHOICE

MICROSOFT WINDOWS READY-TO-RUN

intel inside

yes NetWare Tested and Approved

energy

BETWEEN MONEY & POWER:

Austin 466C-213

- 486DX2-66 Processor
- 8 MB RAM
- 213 MB Hard Drive
- Dual Scan Color Display

$2,999 Lease $112/month*

Austin 466T-340

- 486DX2-66 Processor
- 8 MB RAM
- 340 MB Hard Drive
- TFT Active-Matrix Color Display

$4,499 Lease $157/month*

LIMITED AMOUNTS OF ONE, ENOUGH OF THE OTHER.

anywhere. And a front-and-center 16 mm trackball that's easy to access, easy to use.

But there's more. To give you an even better run for your money, all notebook configurations are available with an optional 524 MB hard drive (the industry's largest), convenient docking station, and travel accessories.

If feeding your hunger for high performance leaves you feeling spent, call us toll-free today. Austin Computer Systems. Where the price of power is always low.

Call Direct 1-800-331-1501

Austin Computer Systems • An IPC Company • 10300 Metric Blvd., Austin, TX 78758
FAX: 512-454-1357 • Overseas: 512-339-3500 • Canada: 1-800-338-1565

AUSTIN
AN IPC COMPANY

©1994 Austin Computer Systems. All rights reserved. The Intel Inside logo is a registered trademark of Intel Corporation. Microsoft is a registered trademark and Windows and the Windows logo are trademarks of Microsoft Corp. All other company names and products are trademarks or registered trademarks of their respective owners. Prices and specifications are subject to change without notice. *Lease term reflects 36-month contract.

Business Card Scanners: Some Glitz, Some Glitches

Wouldn't it be great to move the contact data on business cards into your PC without doing any typing? We examined three Windows-based optical character recognition products designed for business cards that promise just that sort of convenience. They speed up the tedious chore but still require some human help for 100 percent accuracy. Our results were satisfactory—but there were some glitches.

We tried the products with ten business cards sporting different colors, type sizes and styles, and name, address, and company formats. Two products we examined come with a dedicated card scanner; the third requires that you provide a scanner. All include a built-in database and/or contact manager, and all can export field data in several formats.

On our 33-MHz 486DX with 12MB of RAM, we waited on average a tolerable 10 to 15 seconds for the products to scan a card, convert the data to machine-readable format, and dump the information into what they considered the correct field in their respective databases. Information that the programs couldn't assimilate accurately went into a small window; we then assigned it to a field.

CypherScan 1000, Scan-in-Dex, Cognitive BCR business card scanners

WINDOWS Three business card scanner products that—with some effort—allow you to move card data into database fields.

CypherTech Inc.
408/734-8765,
408/734-8763 (fax)
List price: $395, without scanner $145 to $245
Reader service no. 644

Microtek Lab Inc.
800/654-4160,
213/321-2121
List price: $399
Reader service no. 645

Cognitive Technology Corp.
415/925-2367,
415/461-4010
List price: $99
Reader service no. 646

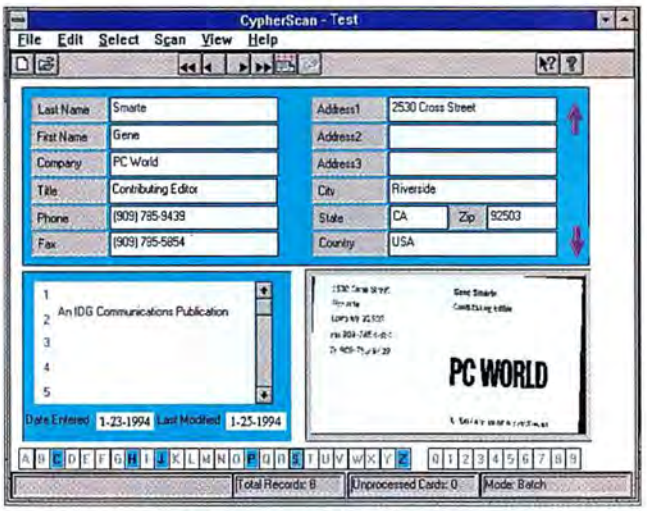
CypherScan 1000

This four-disk $395 package from CypherTech comes with a dedicated card scanner and an add-in board. It also gives you the option of using a third-party flatbed or hand-held scanner. After you create a new contacts database or choose an existing one, you begin scanning cards in either interactive or batch mode. In interactive mode, each card is processed as it's scanned. You can view it, make any needed corrections, and save it. In batch mode, you can run as many cards through the scanner as you have, let them be processed while you do something else, and then edit the results.

You get drag-and-drop editing and all the viewing, sorting, exporting, printing, and importing options you're likely to need. An on-screen tutorial gets you started quickly. Plus, CypherScan works with just about any scanner available. This was our favorite product.

Scan-in-Dex

Microtek's $399 Scan-in-Dex comes with the same dedicated card scanner as CypherScan but works only with this scanner.



CYPHERSCAN 1000 helps you keep track of your business cards. It might even let you see the top of your desk again.

The accuracy of the scans was about the same, and you can process cards singly or in batches. However, you can scan only one card at a time.

We liked the product's capability to have as many as four contact files open at once so you can enter cards into different files without having to presort cards or open and close lots of files. Like CypherScan, Scan-in-Dex accepts vertical business cards, but you must place them in the prescribed orientation.

Cognitive BCR

The $99 Cognitive BCR from Cognitive Technology has the fewest features of the three, but you shouldn't discount it. It's sold separately and in bundles with a variety of scanners. We used an HP ScanJet IIp flatbed scanner (HP is not among the vendors making bundling arrangements with Cognitive) and found adequate results. As with CypherScan, you can do batch scanning. You can also drag and drop unrecognized information into data fields, including a notes section.

You can use Cognitive BCR as a basic contact manager or you can export the data to your favorite database. You can also link a BCR database to your Lotus Organizer address book. Cognitive BCR is the only product of the three that has a built-in telephone dialer.

Good But...

For all these products, we found that about nine out of our ten sample cards required manual corrections in one or more fields. The inability to automatically pluck out a company name buried in or encircled by graphics was a problem common to all three. Even the relatively simple *PC World* logo was not always placed in the correct company field, although with Cognitive BCR you could simply drag the name to the company field to have it recognized.

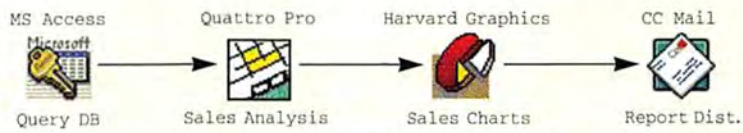
CypherScan is probably your best choice. The product is loaded with features, and you can buy the program separately to use with your existing scanner ($145 to $245).

—Gene Smarte

Your software programs were barely speaking. Then something clicked.

If you're tired of playing matchmaker to software applications (even ones from the same vendor), you'll be pleased to hear this. There is a product that does it for you, now. Prodea Synergy™ makes the programs you already have, and what you've built with them, work together. A few points and clicks, and applications will exchange just about everything but valentines.

Mr. R. Lee Allen of Schering-Plough, a company already using Prodea Synergy, put it less romantically although no less enthusiastically. "It's not like anything out there before. It's more than OLE or DDE. It transcends both languages and APIs."



Drag and drop the icons, connect them with arrows. Data flows automatically.

You should also know that what you build is easy to pass on to others, without worrying about hot links, paste links or file location. Prodea Synergy runs under Windows,™ costs $495 and has a 30-day money-back guarantee. For a limited time you also get a $200 introductory cash rebate. Call us at 1-800-PRODEA-1. Your software programs will never look at one another the same way again.

PRODEA *Synergy*™

© 1993 Prodea. All products and brand names are trademarks or registered trademarks of their respective owners.

Circle 149 on reader service card

Continued on page 109

Complex Image Editing That Won't Bend Your Brain

Aldus is shipping version 2.0 of its image editing program PhotoStyler. Designed to compete directly with Adobe Photoshop, PhotoStyler 2.0 targets the nongraphics professional who needs an easy-to-use but powerful image editor.

PhotoStyler boasts some innovative safeguards that prevent users from destroying images while editing them. A Practice Pad lets you see what a brush or an effect will look like before you apply it to the actual image. Multi-Preview lets you look at different effects side by side before you apply them. Much of the interface's ease-of-use capabilities are built on redundancy. There are several options for, say, zooming, so you don't have to hunt for the right menu choice or tool. Fortunately, the tool bar is customizable, so this redundancy doesn't *have* to take over your screen.

Though not available in the beta version we examined, PhotoStyler 2.0 is expected to offer color-proofing capabilities that show you—before you print—the colors you'll get on your output device. Indicate the kind of output and input devices, and PhotoStyler compensates for their idiosyncrasies and displays an output sample.

PhotoStyler is integrated with U-Lead Systems Image Pals 1.2's image browser, which lets you see thumbnails of all your images divided into albums. Want to edit one of those thumbnails? Drag it to the PhotoStyler icon the program loads with your image. Aldus also claims PhotoStyler 2.0 has a tighter integration with PageMaker 5.0 than competitors do.

—Christina Wood

Aldus PhotoStyler 2.0

WINDOWS PhotoStyler provides powerful high-end image editing without bending your brain.

Aldus Corp.

206/622-5500

List price: $795, upgrade $150

Reader service no. 648

ALDUS PHOTOSTYLER 2.0 has a Practice Pad so you can try out a brush before you make any changes to your image.

Q&A Database Finally Moves to Windows

Now that Windows databases are hot, Symantec has introduced a Windows version of the program that wrote the book on easy-to-use flat-file database managers: Q&A. With its combination of familiar Q&A tools and new graphical additions, Q&A 4.0 for Windows should give other simple Windows database programs such as FileMaker Pro and AceFile a run for their money. Here's what we found in our examination of a prerelease version of Q&A 4.0 for Windows.

At its heart, there's nothing new about Q&A for Windows. It's still a flat-file database that can handle only one file at a time, but it allows you to combine—in a limited way—information from two files into one new file. Symantec has improved the file format to take advantage of Windows, however. For one thing, you can add picture fields to your database. And you can now create multiple forms for a single database. The forms will look much better if you use all the great design tools.

But these changes come at a price: Q&A for Windows must convert a DOS Q&A database before it can read it. And most copies of Q&A for DOS, even of the current version, 4.0, can't read a Q&A 4.0 for Windows file at all. If you want to share data between the two current Q&As, your DOS version must be dated 8/30/93 or later (the $89.95 DOS-to-Windows upgrade kit includes a free upgrade of the DOS version).

Q&A 4.0 for Windows provides a spreadsheetlike table view that's light-years ahead of anything FileMaker Pro—or even the more versatile Approach—has to offer. Not only is the view readable and writable, you can rearrange your table, moving and resizing columns with simple dragging and dropping. And you can save your arrangement for the next time you use the table view.

The old Q&A report writer was showing its age, so Symantec updated this feature in the Windows product. The new band-oriented report writer gives you much more flexibility, although people familiar with the old tool will find its equivalent here too.

As with the DOS version, Q&A for Windows is bundled with a modest word processor that gives you all you need to handle mass mailings.

—Lincoln Spector

Q&A 4.0 for Windows

WINDOWS A familiar name in easy database management finally turns up in Windows.

Symantec

408/253-9600, 408/253-4092 (fax)

List price: $249.95

Reader service no. 647

Now Get Exactly the 486 PC You Want.

Designed By You.

– You specify exactly what you want. –

Built By The Best.

– Manufactured to your order for Inmac by IBM. –

Ready to Ship in 72 Hours.

That's fast, real fast, and includes rigorous testing.
Find out more inside.

inmac

17 YEARS OF THE BEST VALUE AND SERVICE.

Since 1976, Inmac has been recognized for superior service, the broadest PC and Networking product selection and exceptionally low prices.

Fast delivery.

Order a customized Inmac Insignia™ and we'll ship it in just 72 hours. In a hurry? Order a pre-configured system—it ships in only 24 hours.

Manufactered for Inmac by IBM.

Inmac Insignias™ are American engineered and manufactured with award-winning quality.

1-year on-site service, guaranteed.

If your Inmac Insignia™ system fails, we will send a service representative with parts. If they don't arrive when promised, we'll give you a $25 credit on your next order of $100 or more. (*Some remote areas may take up to three business days for service. Call for information.*)

1-year limited warranty.

Inmac Insignia™ systems come with a one year on-site parts and labor warranty against defects in material or workmanship.

Toll-Free 24-hour technical advice.

We've built an ace staff of experts whose sole job is to answer your technical questions... at no charge to you.

30-day satisfaction guarantee.

If you're not satisfied with an Inmac Insignia™ product, contact customer service for a return material authorization, and return it within 30 days for a refund of the original purchase price. (*Shipping/handling charges are not refundable*).

ORDER IT TODAY

1·800·547·5444

FAST SHIPMENT

Priority Code #K14409

In Canada call toll free 1-800-387-2173

BUILT TO ORDER, READY TO SHIP IN 72 HOURS.

Get precisely the right amount of PC performance and features you need — ready to ship in 72 hours. Designing your built to order Inmac Insignia is a snap. And with no hidden charges for the system you want. Call us and our team of experienced advisors will guide you through every step of the process or you can do it yourself following the easy steps below.

Inmac Insignia 486 PCs are manufactured to your order for Inmac by IBM. And you can add a fabulous selection of high-performance peripherals and software of your choice at an amazingly low price, and with round-the-clock service and support.

1 Each Inmac Insignia system comes standard with MS DOS, Windows, QA Plus, Lotus Organizer software, and an enhanced 101 keyboard & mouse; as well as:

- Accelerated local bus video
- 4 Drive bays
- 4 MB RAM
- 170 MB Drive
- 5 ISA Expansion slots
- 3½ Floppy Drive
- 14" .28 NI SVGA monitor

SYSTEM

1 ☐	450SL – IBM 486SLC2 25/50 MHz CPU	$1299
2 ☐	433P – Intel 486DX/33 CPU	$1599
3 ☐	450P – Intel 486DX2/50 CPU	$1849
4 ☐	466P – Intel 486DX2/66 CPU	$1999

If you need more features and peripherials proceed through the next five steps to specify your own perfect system. Add the price for each option to the basic system price lisings in step one, or simply call Inmac for instant quote.

2 Each Inmac Insignia system comes with 4 MB of RAM. If you need more memory or want to add cache, choose from the list of memory options below.

MEMORY (UPGRADE TO)

5 ☐	8 MB RAM (extra 4 MB)	$230*
6 ☐	16 MB RAM (extra 12 MB)	$690*
7 ☐	32 MB RAM (extra 28 MB)	$1640*
8 ☐	64 MB RAM (extra 60 MB) (not available on 450SL)	$3530*

Call for latest pricing.

CACHE

9 ☐	128 KB cache (not available on 450SL)	$35*
10 ☐	256 KB cache (not available on 450SL)	$59*

3 Each system comes with a 3½" floppy drive and 170 MB IDE hard drive. But you can customize your system to suit your storage needs by adding extra hard or floppy drives. Each Inmac Insignia comes with four drive bays.

HARD DRIVES (UPGRADE TO)

11 ☐	255 MB	$40*
12 ☐	340 MB	$109*
13 ☐	540 MB (requires SCSI interface adapter)	$500*

ADDITIONAL FLOPPY DRIVES

14 ☐	Additional 5¼" FDD	$75*
15 ☐	Replace w/ Dual 3½" and 5¼" FDD	$80*

CD ROM DRIVES

16 ☐	NEC 510 (450 KB/S) (requires SCSI interface adapter)	$389*
17 ☐	Panasonic 563 (150 KB/S)	$199*

4 Each system comes standard with a 14" .28 NI SVGA monitor. You can upgrade to a larger one to have extra room for graphics, desktop publishing, or multiple Windows applications.

MONITOR (UPGRADE TO)

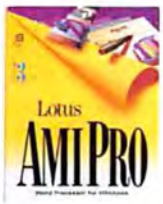
30 ☐	17" .28 NI SVGA Monitor –	$624*

OUR LOW COST LEASING PLAN MAKES EVERYTHING AFFORDABLE RIGHT NOW.

In addition to our low prices, we offer an excellent lease plan to make your Inmac Insignia purchase even more affordable. Payments are as low as $46/month for an Inmac Insignia 450SL priced at $1299. Call Inmac for complete lease option details. Lease prices are based on a 36 month open-end commercial lease. Subject to approved credit with certain terms and conditions. Prices and specifications subject to change without notice.

BUILT TO ORDER • BUILT TO ORDER • BUILT TO ORDER
BTO

5 Each system comes standard with MS DOS, Windows, QA Plus, and Lotus Organizer. We can load any of the latest versions of the hottest selling titles. Check out the bundled suites!



6 Each system comes standard with five expansion slots. Add Ethernet network adapters and a high speed fax/modem to make sure you're well connected. CD-ROM and sound cards are your gateways to the fabulous world of exciting multimedia applications with full motion video and stereo sound.

SOFTWARE**

16 ☐	MICROSOFT WORD	$299*
17 ☐	WORDPERFECT	$289*
18 ☐	LOTUS AMI PRO	$239*
19 ☐	MICROSOFT EXCEL	$299*
20 ☐	LOTUS 1-2-3	$319*
21 ☐	BORLAND QUATTRO PRO	$49*
22 ☐	MICROSOFT MONEY	$15*
23 ☐	BORLAND PARADOX	$129*
24 ☐	MICROSOFT POWERPOINT	$315*
25 ☐	LOTUS FREELANCE	$339*
27 ☐	MICROSOFT OFFICE	$485*
28 ☐	LOTUS SMARTSUITE	$459*
29 ☐	BORLAND OFFICE	$389*

DATA COM/ADAPTERS

31 ☐	3Com Etherlink III Combo 3C509	$130*
33 ☐	Internal 9600/2400 Fax/Modem	$60*
34 ☐	Internal 14400 Baud Fax/Modem	$205*
35 ☐	16-bit Fast SCSI Adapter	$175*

MULTIMEDIA

36 ☐	NEC 510 (450 KB/S) (requires SCSI interface adapter)	$389*
37 ☐	Panasonic 563 (150 KB/S)	$199*
38 ☐	Creative Labs Sound Blaster 16	$199*
39 ☐	Media Vision Pro Audio Spectrum 16	$169*

*Add price to base price of system.
**Software programs are for MS Windows.

WE'LL HELP YOU DESIGN YOUR SYSTEM.

We have a friendly and knowledgeable team of experts ready to help you specify your system and take your order. Call TOLL-FREE 1-800-547-5444 for your instant price quote. Order an Inmac Insignia built just for you.

It's easy to order from Inmac. Use your Visa, MasterCard, or American Express credit card. Or, you can lease. Corporate buyers, call us and ask about setting up an open account.

30 SATISFACTION DAY GUARANTEE

24 HOUR SUPPORT

Priority Code #K14409

ORDER TOLL FREE 1-800-547-5444

NEED IT FASTER! PRE-CONFIGURED SYSTEMS SHIP IN JUST 24 HOURS.

INMAC Insignia 450 SL

K1005PC **$1299**
Lease Option $46/month

- IBM 486SLC2 25/50 MHz CPU with 16 KB internal cache
- Accelerated local bus graphics with 1 MB display RAM
- 5 ISA slots and 4 drive bays.
- 4 MB RAM, upgradeable to 32 MB
- 170 MB, 16 ms IDE hard drive
- 14", .28 pitch non-interlaced 1024x768, 72 Hz flicker-free SVGA color monitor
- Enhanced 101-key keyboard and mouse
- 3.5" floppy drive, one parallel port, two serial ports
- MS DOS, MS Windows, QAPLus, Lotus Organizer software, FREE

INMAC Insignia 433P

K1002PC **$1599**
Lease Option $56/month

- i486 DX/33 MHz CPU with 8 KB Write-Thru cache
- Accelerated local bus graphics with 1 MB display RAM
- 5 ISA slots and 4 drive bays
- Upgradeable to Pentium Technology
- 4 MB RAM, upgradeable to 64 MB
- 170 MB, 16 ms IDE hard drive
- 14", .28 pitch non-interlaced 1024x768, 72 Hz flicker-free SVGA color monitor
- Enhanced 101-key keyboard and mouse
- 3.5" floppy drive, one parallel port, two serial ports
- MS DOS, MS Windows, QAPLus, Lotus Organizer software, FREE

INMAC Insignia 450P

K1003PC **$1849**
Lease Option $72/month

- i486 DX2/50 MHz CPU with 8 KB Write-Thru cache
- Accelerated local bus graphics with 1 MB display RAM
- 5 ISA slots and 4 drive bays
- Upgradeable to Pentium Technology
- 4 MB RAM, upgradeable to 64 MB
- 170 MB, 16 ms IDE hard drive
- 14", .28 pitch non-interlaced 1024x768, 72 Hz flicker-free SVGA color monitor
- Enhanced 101-key keyboard and mouse
- 3.5" floppy drive, one parallel port, two serial ports
- MS DOS, MS Windows, QAPLus, Lotus Organizer software, FREE

INMAC Insignia 466P

K1004PC **$1999**
Lease Option $78/month

- i486 DX2/66 MHz CPU with 8 KB Write-Thru cache
- Accelerated local bus graphics with 1 MB display RAM
- 5 ISA slots and 4 drive bays
- Upgradeable to Pentium Technology
- 4 MB RAM, upgradeable to 64 MB
- 170 MB, 16 ms IDE hard drive
- 14", .28 pitch non-interlaced 1024x768, 72 Hz flicker-free SVGA color monitor
- Enhanced 101-key keyboard and mouse
- 3.5" floppy drive, one parallel port, two serial ports
- MS DOS, MS Windows, QAPLus, Lotus Organizer software, FREE

450SL Home Office Bundle just $1699

Order your Inmac Insignia 450SL with the Home Office hardware and software bundle and save hundreds of dollars. You get the standard configuration 450SL plus extra hardware and over $1300 worth of top brand software. All for just $1699. You save $900 off list price!

- Internal 9600/2400 Fax/Modem
- Microsoft Money for Windows
- Comm/Fax Software
- WordPerfect for Windows
- Quattro Pro for Windows

INMAC INSIGNIA 450SL *Home Office Bundle*
K1013PC **$1699**
Lease Option $60/month

Business Office Bundle just $2399

You save more than $1500 when you order your Inmac Insignia 450P computer Business Office Bundle. You get additional RAM plus a quartet of top brand software. Everything you need to get to work the minute you plug your system in. We'll install and test it all for you, FREE.

- Additional 4 MB RAM, total of 8 MB
- Quattro Pro for Windows
- Central Point PC Tools for Windows
- WordPerfect for Windows
- Paradox for Windows

INMAC INSIGNIA 450P *Business Office Bundle*
K1015PC..... **$2399**
Lease Option $92/month

Call Us Toll Free 1-800-547-5444
Fax us at 1-800-972-3210
In Canada call toll free 1-800-387-2173
(Prices and delivery may differ, please inquire).

PRIORITY CODE: K14409
Please use your priority code when ordering.

ORDER IT TODAY
1·800·547·5444
FAST SHIPMENT

VISA AMERICAN EXPRESS MasterCard

It's easy to order from Inmac. Use your Visa, MasterCard, or American Express credit card. Corporate buyers, call us and ask about setting up an open account.

inmac
P.O. Box 168065, Irving, Texas 75016-9901

All prices and specifications subject to change without notice. Not responsible for typographical errors.
Copyright 1993, Inmac Corporation. Inmac Insignia and Inmac are trademarks or registered trademarks of Inmac Corporation. IBM is a registered trademark of IBM Corporation. All other product or service names mentioned are trademarks of their respective owners.

Continued from page 104

Windows Sound System: More Features, More Power

Windows Sound System 2.0

WINDOWS Get the most out of your hardware with this suite of Windows-based sound utilities that supports voice recognition, MIDI playback, and WAV file editing.

Microsoft Corp.
800/426-9400,
206/882-8080,
206/936-7329 (fax)
List price: $79, hardware version $219
Reader service no. 652

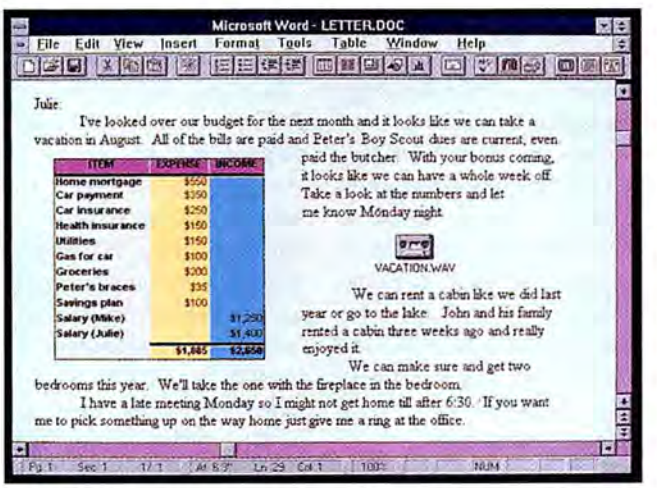
Microsoft's Windows Sound System has gone soft—soft*ware*, that is. The product no longer includes the 8-bit sound card that was bundled with the original software. With this upgrade you get an improved interface and more features, including the capability to work with any 16-bit sound board. Many of the functions are improved, including voice recognition, document proofing, and WAV file recording, editing, and playback.

Sound System 2.0 includes Voice Pilot, a Windows-based voice recognition program that lets you control applications, handle basic data entry, and create macros to speed basic operations. With a 256-word vocabulary, Voice Pilot isn't powerful enough to take dictation for your business correspondence, but it can save a lot of time when you're mousing around by allowing you to issue voice commands to open files or applications, for instance. Built-in Wizards help users get up and running immediately, while a choice of vocabulary training sessions lets you increase the software's recognition rate.

Other Sound System applications include ProofReader, which reads back documents such as spreadsheets and letters, and Sound Finder, which lets you search for sound files, view information, and drag sound clips into OLE-aware documents. Quick Recorder and Sound Editor let you play, edit, and record WAV files and offer more file compression options to save disk space than the previous version of Sound System. Sound System features greater compatibility with popular game software by adding Sound Blaster emulation under DOS. Perhaps more important, the product's setup utility helps you through the sometimes-difficult installation routine by prompting for information and configuring hardware automatically.

Windows Sound System 2.0 comes with a set of headphones and a customized microphone designed to allow Voice Pilot to work in noisy office environments. Microsoft also sells a $219 version of Sound System 2.0 that has a sound board.

—Michael Desmond



SOUND SCENE: Windows Sound System lets you attach sound files to your documents, as illustrated by the cassette icon above.

Caere Rejuvenates Its Leading OCR

OmniPage Professional 5.0

WINDOWS This product offers numerous improvements, including better recognition technology, tool bars for accessing common functions, and support for the TWAIN scanner interface.

Caere Corp.
800/535-7226,
408/395-7000
List price: $695, upgrade $129 to $179
Reader service no. 649

Caere's OmniPage Professional 5.0 optical character recognition (OCR) software includes many technical improvements that make the product more accurate and easier to use.

OmniPage Professional uses several methods to boost the accuracy of its character recognition. The first, three-dimensional OCR, improves the ability to see subtle shades, contours, and spaces on documents—especially helpful for poor-quality faxed or photocopied documents.

OmniPage Professional also has tools for specific document types. The AnyFax feature works on faxes by disconnecting joined characters and reducing the jaggies. True Page Recognition lets users handle documents containing both images and text. And you have access to the full retail version of Caere's solid image editing package, Image Assistant.

Caere has replaced its menu-driven interface with an intuitive button-based one. The tool bar across the top of the screen includes buttons to automate the entire scanning/OCR process, access the settings panel, edit a document, open Image Assistant, and perform other common tasks. You'll also find buttons for adjusting the orientation of the document and for selecting processing zones.

OmniPage Professional is now TWAIN compliant, which means that it works with more popular scanners and has a WYSIWYG text editor. While the product doesn't have Object Linking and Embedding 2.0 support or offer the tight integration with Windows applications that's found in its biggest competitor, Calera Recognition Systems' WordScan Plus 2.0, we were quite pleased with OmniPage Professional's robust OCR engine and the product's greatly improved interface.

—Anita Hamilton

WinSleuth Gold Plus Keeps Addin' On

WinSleuth Gold Plus

WINDOWS The latest diagnostic software makes it easier to add peripherals to your system.

Dariana Software Inc.
800/892-9950,
714/236-1380,
714/236-1390 (fax)
List price: through March $99.95, $189 thereafter
Reader service no. 633

About three years ago Dariana Software launched the original Windows diagnostic and analysis program, WinSleuth. That was followed by major enhancements, WinSleuth Professional in 1991 and WinSleuth Gold in 1992. The latest incarnation, WinSleuth Gold Plus (introductory price $99.95), despite an annoying inconsistency, is another improvement on this handy software.

The latest WinSleuth offering makes it simpler to add peripherals such as CD ROM drives, sound boards, and LAN adapters. IRQ, DMA, and communication port data files are included for about 40 add-in cards that let you point and click configuration options during installation. You can also save your configurations and reload them when needed. This capability is very useful when you need to swap cards, because you don't have to figure out what parameters to use for the card when you're installing it.

The use of help balloons throughout WinSleuth Gold Plus is another much needed improvement. You can click a screen heading and receive a brief explanation of relevant technical terms. More useful additions include system statistical info, such as the number of cache hits, and performance testing for video, hard disk, and memory chips. If you suspect one of your memory chips is failing, you can work both conventional and extended memory chips for up to 24 hours at a time to identify the culprit.

We had one beef with the product—an apparent conflict in the reporting of DMAs and IRQs in use. The DMA/IRQ button correctly displayed one sound card's use of DMA1 and IRQ5. But when we went to the Direct Test screen and asked to test for available DMAs and IRQs, the screen indicated that DMA1 and IRQ5 were 'free'. Even with the sound card blaring the Battle Chess theme, the DMA/IRQ combination in question was shown to be available. Dariana claims that we uncovered a sound card reporting bug, which it expects to fix in the next upgrade. The upgrade will be free to registered users and will include some new features as well, the vendor says.

—Gene Smarte

WINSLEUTH GOLD PLUS makes it easy to look at, modify, test, and install hardware and software products in the Windows environment.

WinSense 2.0: Maximize Windows Performance

This $89.95 Windows utility lets nontechnical types optimize their PC's performance. And more sophisticated users will appreciate the product's INI file editor. WinSense 2.0 provides some aesthetic and practical improvements over version 1.2 that help you navigate and solve Windows problems faster. For example, you'll find better help boxes and new icons. There are also new tips on multitasking, memory, and fonts. But WinSense's three main features stay the same: the tune-up for optimizing the PC, dialog boxes that lead you through easy INI file editing, and backup features.

WinSense 2.0

WINDOWS This utility helps you optimize Windows INI files to improve your PC's performance.

SoftLogic Solutions
800/272-9900,
603/627-9900
List price: $89.95
Reader service no. 651

When you set up WinSense, the software performs an initial Windows tune-up. WinSense determines your hardware resources and asks questions about your work, such as what applications you use most. The program then suggests changes to the Windows INI files to improve performance.

For example, in a system short on memory, WinSense recommends a large disk cache for database users but a small one for word processor users. The program presents the tune-up recommendations in a list. For each recommendation, just click to see a detailed explanation of why WinSense would like to modify the INI file.

WinSense also lets you edit INI files on your own easily. Explanatory help screens are available with just a click. The software makes automatic backups for restoring INI settings. You can save and name backups, then easily compare them later. This feature lets you spot changes in INI files, such as those that happen when you install a new application. WinSense also has a large hypertext library of Windows information.

—Laurianne McLaughlin

(America Online)

(America Online is not really a pair of glasses, it is an online information service.)

Circle 107 on reader service card

It's in the Cards: New PCMCIA Modems From Xircom, Hayes

The latest in PCMCIA credit card–size modems include an innovative network/modem card from LAN adapter manufacturer Xircom and a 14.4-kilobits-per-second (kbps) speedster from market leader Hayes Microcomputer.

LAN/Fax-Modem Combo

Xircom's new CreditCard Ethernet+Modem is for notebook users who've found that the single PCMCIA slot found in many notebooks and subnotes doesn't provide enough room for their peripherals. This two-in-one product packs an ethernet LAN adapter and a 14.4-kbps fax-modem into a tiny PCMCIA Type II card. List priced at $699, it's also available as an external model, the Portable Ethernet+Modem, that connects to the parallel port. Xircom claims that an Ethernet+Modem costs 15 to 25 percent less than a separate LAN adapter and fax-modem.

One particularly nice feature of Xircom's Ethernet fax-modems is their concurrent LAN/modem access: You can send a fax or dial a BBS while remaining logged on to the network. Like all modems, Xircom's products support remote access software such as pcAnywhere, Carbon Copy, and CloseUp. And for ethernet LAN access, the Ethernet+Modems support data transfer rates of up to 10 megabits per second.

Because the Portable Ethernet+Modem connects to the parallel port, it leaves the serial port free for other external peripherals, such as a mouse or keypad. Also, because the parallel port (particularly the faster enhanced parallel ports found on today's notebook PCs) offers faster throughput than the serial port, the Portable Ethernet+Modem should transfer data faster than serial-based 14.4-kbps external modems, according to Xircom. However, we weren't able to verify this claim at press time.

The Portable Ethernet+Modem offers another innovative feature: the Phantom Power Cable. While this may sound like an otherworldly connector that hovers above your notebook, in reality it's a cable that runs from the Portable Ethernet+Modem to your notebook's mouse or keyboard port. The modem draws power from the notebook, thus eliminating the need for a separate battery pack. You can, however, plug the modem into an AC outlet if one is available.

While not everyone can justify the expense of an Ethernet+Modem, this LAN/fax-modem combo is handy for mobile professionals who use their portables both in the office and on the road.

HAYES DOES PCMCIA with its new Optima 144 + Fax144 modem, which costs $399.

Hayes Adopts PCMCIA

For many modem buyers, the name Hayes is synonymous with quality—and high prices. However, the company's new Optima 144 + Fax144 for PCMCIA fax-modem is priced comparably to its competitors. This $399 Type II modem sends and receives data and faxes at 14.4 kbps. And like Xircom's CreditCard Ethernet+Modem, the Optima 144 includes V.42bis data compression to yield a theoretical maximum throughput of 57.6 kbps.

The Optima comes with Hayes's Smartcom for Windows data and fax communications software. The product includes Hayes AutoSync, a feature that allows notebook users to communicate synchronously with mini- and mainframe computers back at the office.

Unfortunately, the Optima's bulky line adapter module (which connects the PCMCIA modem to the phone cable) is only slightly smaller than an external portable modem. This defeats many of the advantages of a credit card–size modem.

—Jeff Bertolucci

ALL-IN-ONE MODEM AND LAN ADAPTER: Xircom's new Ethernet+Modems combine a 14.4-kbps modem and a 10-mbps LAN adapter into one small package.

Xircom Ethernet+Modems

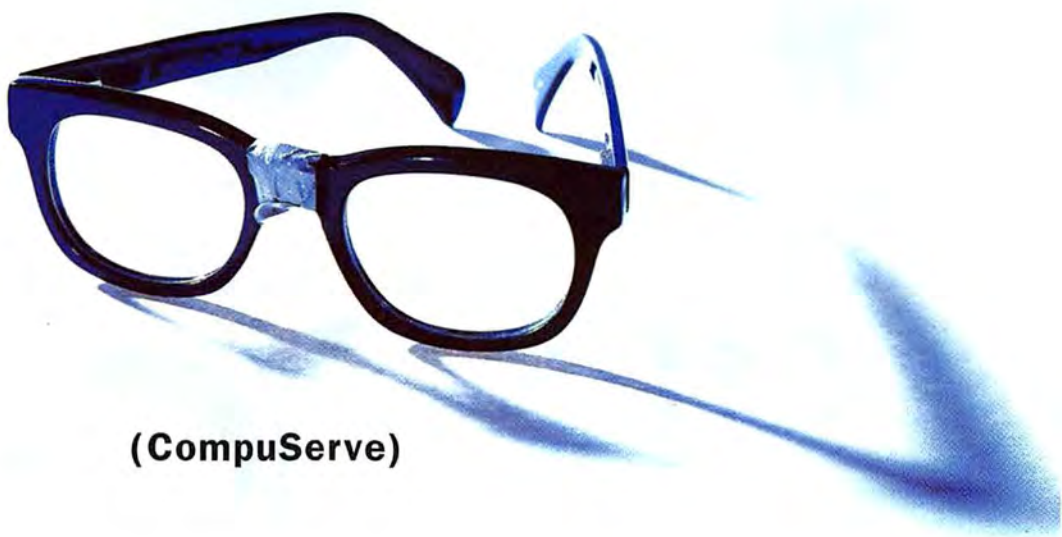
These combo LAN/fax-modem peripherals come in both PCMCIA and portable models.

Xircom Inc.
800/874-7875,
818/878-7600,
818/878-7630 (fax)
List price: $699
Reader service no. 616

Hayes Optima 144 + Fax144 for PCMCIA

A new credit card–size fax-modem that offers 14.4-kbps data and fax performance.

Hayes Microcomputer Products
404/441-1617
List price: $399
Reader service no. 617



(CompuServe)

(CompuServe is not really a pair of glasses, it is an online information service.)

Circle 107 on reader service card

What we're trying to say here is this is not your father's online service. This is GEnie.® And if you want to have some real fun, this is where you belong. Because no other online service has more cool stuff to do, or more cool people to do it with. And there's something new every day. So get on GEnie now. You won't believe your eyeballs.

Gab, gossip, babble, ask, tell, question, answer, confirm, deny, agree, debate, scream, whisper, say something, say anything. GEnie chat. The one and only.

Explore strange new galaxies, seek out new life and new civilizations, or better yet, just hang out with people like you and talk about it. We've got RoundTables you'll actually care about. Science Fiction, comics, electronics, Mac, God, White House, motorcycles, MIDI, soaps. It's a cool world if you know the right people.

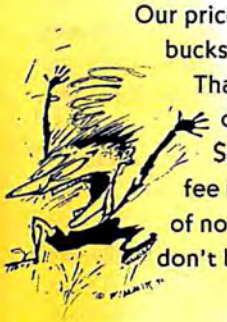
Over 200,000 files to download. Games, graphics, sounds, text and then some. If that's not enough to keep you busy, you need to get out more.

If you're having a problem with your computer, you can talk with one of our experts. And if that doesn't help, just give it a good swift kick. Hey, it could work.

Kick butt in CyberStrike,™ winner of *Computer Gaming World's* 1993 On-line Game of the Year Award. Want more butt-kicking? Try Air Warrior® or MultiPlayer BattleTech.™ Less butt-kicking? How about GemStone III,™ the fantasy role-playing adventure. No butt-kicking? Okay, we'll get back to you.

Cool offer

Join GEnie® Services now, and we'll give you credit against GEnie service charges in an amount up to whatever you spent on your competitive online service in the entire month of October 1993.* And if you can't bear to part with your old pals, they can come, too. Just tell them no pocket protectors. Incidentally, this offer will not be repeated. We want new customers. We don't want to go broke.



Our prices are insane! Only three bucks an hour in non-prime time. That's the lowest of all major online services. And the $8.95 monthly subscription fee includes up to four hours of non-prime time usage. Just don't blow it all the first night.

Even cooler offer!

Tired? Lazy? Technologically inept? Have we got a deal for you. Call now and get a free GEnie front-end program with icons that are incredibly easy to use. Even if you have no clue what an icon is. There's one for Windows and one for Mac.** To get yours, either download once you're on-line, or call 1-800-638-9636 for a free disk.

Get your motor running, head out on the information highway. With access to the Internet, you might discuss anything from the global socioeconomic ramifications of protectionist trade policies with top economists, to the impact of Baywatch with top...uh, Baywatchers.

GEnie®

The most FUN you can have with your computer ON!

Sign up NOW!

1. Set your communications software for half duplex (local echo), at 300, 1200 or 2400 baud.
2. Dial toll free: 1-800-638-8369 or in Canada 1-800-387-8330. Immediately upon connection, enter HHH (Please note: Every time you sign onto GEnie, you need to enter HHH upon connection.)
3. At the U#= prompt, enter JOINGENIE then press <RETURN>
4. At the key code prompt enter AAA222 to get this cool offer.
5. Have a major credit card ready. In the U.S., you may also use your checking account number. In Canada, Visa and MasterCard only.

*Some restrictions apply. Find out what they are before you sign up by calling or logging on to GEnie. Non-prime time is 6 p.m. to 8 a.m. local time Mon.-Fri., all day Sat. and Sun. and selected holidays. This offer is in lieu of all other offers, and is for new subscribers only. You don't have another service? Call us anyway.

** Minimum requirements: 386 and Windows 3.1, 4MB RAM. Mac Plus/Classic or higher, 4 MB RAM.

We've got the biggest big-name guests on-line. Actors, authors, politicians, computer gurus. Sorry, we can't name names. We'd have to deal with Legal. We hate that.

Circle 107 on reader service card

Automate CompuServe With Navigator for Windows

Looking for a way to save money on CompuServe? If you know your way around the service and check your favorite sections on a regular basis, CompuServe's new offline batch-oriented interface, Navigator for Windows, can dial you some savings.

Navigator for Windows (WinNav) minimizes the time you spend online by allowing you to set up sessions while you're offline. You can set up scripts to enter your favorite forums, retrieve messages, send messages, download and upload files, and post messages. Since forums are extended services, billed at $6 to $16 per hour (depending on the data transmission rate), it pays to be efficient. WinNav also lets you automatically send and receive messages on CompuServe Mail and retrieve information from basic services such as weather and stock quotes. Unfortunately, you can't retrieve Associated Press news or travel information with WinNav.

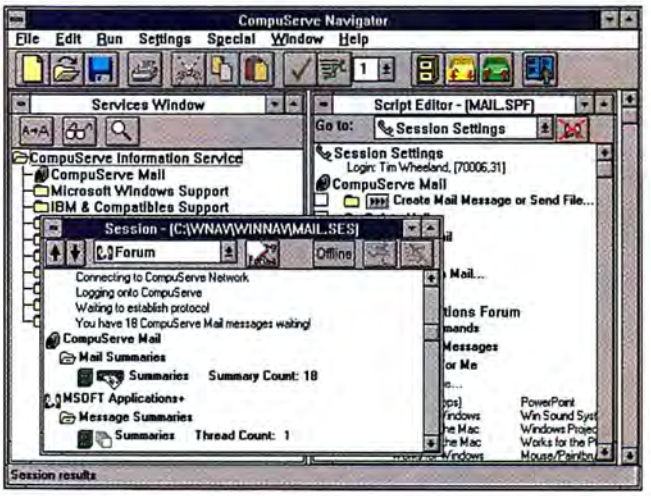
Learning the interface is a bit tricky. Although it employs Windows drag-and-drop and a tool bar across the top of the screen for common functions, the complexity of the interface's features can be confusing. Also, a script template would be useful, so that you could easily duplicate actions such as retrieving, marking, and reading new messages. Instead, Navigator for Windows forces you to set these actions manually for each forum.

But all things considered, WinNav is a great time- and money saver for both power users and online riders alike.

—Anita Hamilton

CompuServe Navigator for Windows

WINDOWS Create sessions offline to save time and money spent online.
CompuServe
800/848-8199, 614/457-8600
Price: unavailable at press time
Reader service no. 619



WINNAV LETS YOU DRAG SERVICES FROM THE SERVICES WINDOW into the script editor and view your session's progress.

Group Scheduler Gets Drag-and-Drop, More Protocol Support

Arranging meetings for groups without running into scheduling conflicts can be a challenge. Fortunately, scheduling software has evolved to fill the needs of work groups, and the latest Network Scheduler 3, version 2, takes the genre a step further by adopting Windows conventions such as drag-and-drop and by supporting more message protocols.

Network Scheduler, like competing products such as On Technology's Meeting Maker and Campbell's OnTime, gives network and remote users access to a common public appointment calendar—as well as to individual calendars—making it easier to find mutually available free time, schedule meetings and reserve conference rooms, determine agendas, make changes, and even keep track of time-zone considerations. It also lets each individual keep personal time-management tasks private.

The latest version's enhanced interface lets you drag and drop appointments, meetings, notes, to-do lists, and other functions common to the group. You also can attach mail messages, detailed agendas, presentations, and spreadsheets, for example, to a scheduled meeting.

Network Scheduler now supports Lotus Notes and cc:Mail using Lotus's Vendor Independent Messaging (VIM) facility. Additional messaging systems now supported include MAPI (Microsoft Mail), X.400, and NetWare Global MHS. A single DOS/Windows version and a separate Mac version (in beta at press time) provide a similar functional interface across dissimilar environments. Network traffic is minimized because as users update or attach notes to a common calendar, the updates are grouped and sent as bundles. Network Scheduler runs on Novell, Microsoft, IBM, Banyan, LANtastic, and other popular networks.

If you're already using version 1.1 of Network Scheduler 3 or are looking for a comprehensive way to synchronize user and work-group scheduling, check out Network Scheduler 3 2.0. The beta version I tested had only one bug, an errant VIM file, which Powercore says is being addressed.

—Gene Smarte

Network Scheduler 3 version 2

WINDOWS An improved interface and increased support for message protocols highlight this network calendar and scheduler.
Powercore Inc.
800/237-4754, 815/468-3737, 815/468-3867 (fax)
List price: for 5 users $495, for 25 users $1995; site licenses available
Reader service no. 618

COMPUTER SYSTEMS SO COMPLETE, THEY'RE ALREADY EQUIPPED WITH SAVINGS.

Looking for a computer system that's exactly right for your business? Look no further than a Compaq Solution Paq.™

Looking for one that's right for your budget? Look no further than a Compaq Solution Paq. A complete, ready-to-go system with everything you need at incredible savings.

Each Solution Paq comes with a Compaq PC (with the Compaq free 3-Year Warranty†), add-ons, and the most widely used business software. Take our ProLinea™ Business Solution Paq, for example. It can help you with accounting, word processing, spreadsheets, cost analyses, graphics, even desktop publishing. Our Contura™ Business Solution Paq puts word processing and spreadsheet capabilities at your command anywhere you travel, and can help you stay in touch with your office wherever you happen to be.

Other time-and money-saving Solution Paqs are available.

Call 1-800-888-5849 and let a knowledgeable Compaq Account Representative help you select a Solution Paq that's just right for you.

The Compaq ProLinea Business Solution Paq.
A complete management and communications solution on your desktop. Includes a Compaq ProLinea 4/33s Model 120, 2,400-bps Data+Fax Modem with WinFax Lite software for sending and receiving faxes, preinstalled Microsoft Works, Microsoft Profit and Microsoft Publisher, TabWorks and CompuServe.

ProLinea 4/33s Model 120 Features
Intel® 486SX/33 MHz processor (upgradeable to 486DX2/66) • 4MB RAM (expandable to 32MB) • 120MB Hard Drive • 3.5" 1.44MB diskette drive • Local Bus VGA with 1MB video memory • Compaq SVGA Color Monitor (1024 x 768 resolution) • 3 full-size slots available for expansion • Drive bay available for CD-ROM, tape, etc. • Preinstalled MS-DOS® 6 and Microsoft Windows™ 3.1 • Compaq 101-key Keyboard and Mouse • 3-Year Warranty • 24-hour service and support hotline available 365 days a year.

The Compaq Contura Business Solution Paq.
Business capabilities at your fingertips wherever you travel. Includes a Compaq Contura 4/25 Model 120, a 2,400-bps Data+Fax Modem with WinFax Lite software for sending and receiving faxes, auxiliary battery, extra battery, carrying case, preinstalled Microsoft® Works, LapLink V, TabWorks and CompuServe.

Contura 4/25 Model 120 Features
Intel 486SL/25 MHz processor with integrated numeric coprocessor • 4MB RAM (expandable to 20MB) • 120MB Hard Drive • 9.5" High Resolution Passive Matrix Monochrome VGA Display; supports up to 64 shades of gray • 3.5" 1.44MB diskette drive • Power conservation and security features • Preinstalled MS-DOS 6 and Microsoft Windows 3.1 • Battery Pack and AC Adapter • Compaq Trackball • 3-Year Warranty • 24-hour service and support hotline available 365 days a year.

intel inside

COMPAQ DirectPlus

1-800-888-5849
Ask for our new free catalog.

†Restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one year warranty. *Leasing is provided by GE Capital Services for a term of 36 months, and is subject to approved credit and certain terms and conditions. Call for details. **Savings based on individual prices. Call for details. ©1993 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. ProLinea and Contura are trademarks and Solution Paq is a service mark of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. All products are trademarks or registered trademarks of their respective companies. Microsoft and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation. The Intel Logo is a registered trademark of Intel Corporation. Offer available in the U.S. only.

Circle 35 on reader service card

With Epson's 1-pass scanning, great images come easy.

Epson ActionScanning System

Epson's 1-pass system captures every detail and nuance of your image in one precise pass.

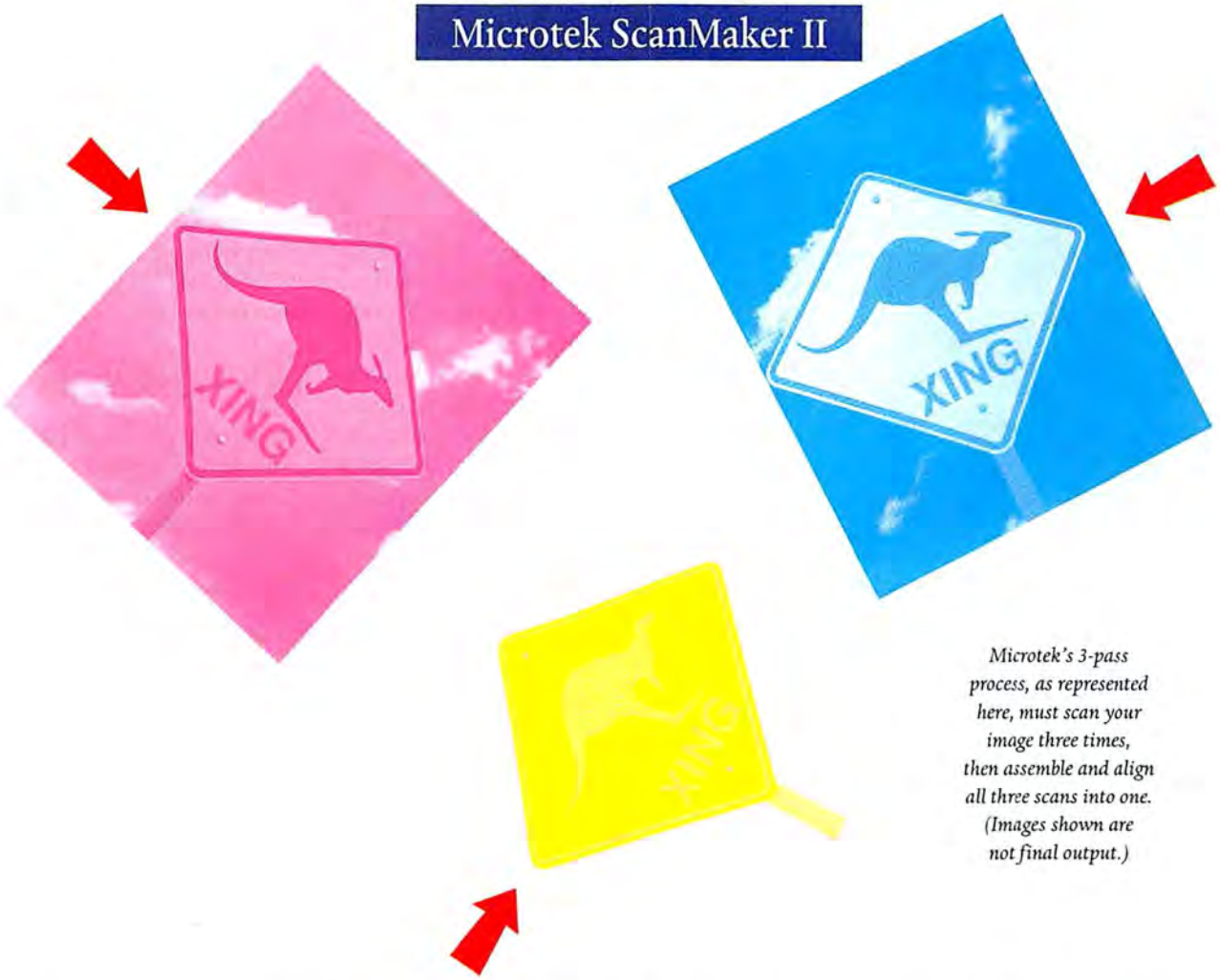
The Epson ActionScanning System. Everything you need in one box for under $1000.

Which scanner would you choose? All signs point to Epson's ActionScanning System for PCs. With 24-bit color, 8-bit grayscale and crisp 600 dpi resolution, it gives you picture perfect results in one simple pass. Precisely adjusting your image is easy, too, thanks to Epson's unique built-in controls. What's more, the ActionScanning System comes with

All company and/or product names are trademarks and/or registered trademarks of their respective manufacturers, including Microtek and ScanMaker which are registered by Microtek Lab, Inc., TextBridge which is a trademark of Xerox Imaging Systems, Inc. and Macintosh which is a trademark of Apple Computer, Inc.

With Microtek's 3-pass scanning, image assembly is required.

Microtek ScanMaker II



Microtek's 3-pass process, as represented here, must scan your image three times, then assemble and align all three scans into one. (Images shown are not final output.)

everything you need to be a scanning expert right out of the box, including Picture Publisher 4.0 LE, one of the most versatile image editing programs around, as well as TextBridge OCR software. For a free booklet on scanning, or to learn more about the easy-to-use ActionScanning System, or our other scanners for PCs and Macintosh, or our full line of personal printers, call the Epson Connection at **1-800-BUY-EPSON** (800-289-3776). This is one scanner you should jump at the chance to own.

Useful Epson options include a transparency unit and automatic document feeder.

EPSON®

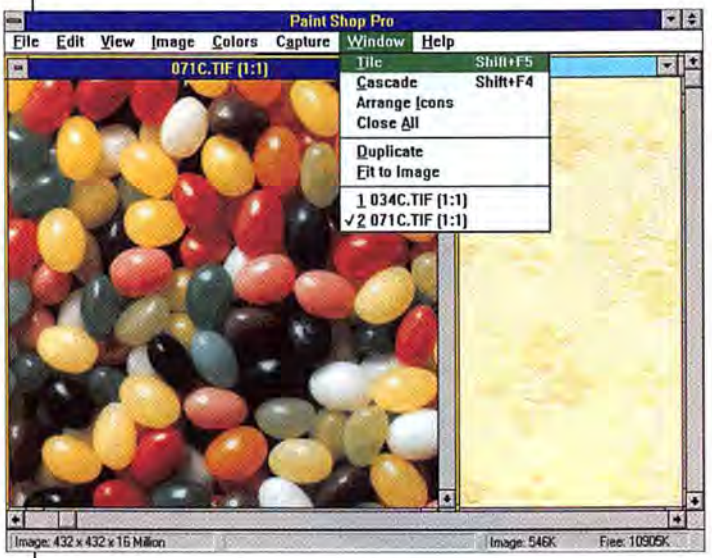
Epson disclaims any and all rights in those marks. Epson is a registered trademark of Seiko Epson Corp © 1993 Epson America, Inc., 20770 Madrona Ave., Torrance, CA 90503.
For dealer referral or warranty details, call **800-BUY-EPSON** (800-289-3776). In Canada, call (**800**) **GO-EPSON**. For Latin America, **305-265-0092**.

Edited by Jeff Bertolucci

Fax and Find

Caere's Fax and Find integrates Delrina's WinFax Pro 3.0 fax software with Caere's own Personal PageKeeper document management program. In addition to including the full retail versions of both products, Caere has created timesaving links between them. Once a fax is received by WinFax Pro, it automatically gets converted into a text file, compressed (up to 50:1), and indexed by keyword for easy retrieval by Personal PageKeeper. You can also send faxes directly from within Personal PageKeeper. Fax and Find lists for $249. Caere Corp., 800/535-7226.

Reader service no. 625



PAINT SHOP PRO 2.0, a $69 graphics utility, adds support for nine additional file formats, including Kodak Photo CD and JPEG.

Reply Video Accelerator Adapter

PS/2 owners can now score a low-cost video upgrade thanks to Reply's new Video Accelerator Adapter for Micro Channel. The add-in card features a Cirrus Logic GD-5426 accelerator chip and 1MB of DRAM to display up to 16.8 million colors at 640 by 480 resolution with an ergonomic 72-Hz refresh rate. The card's maximum resolution at 72-Hz refresh is 1024 by 768, displaying 256 colors. The Reply Video Accelerator Adapter comes with drivers for OS/2, Windows, Windows NT, and major applications. The product lists for $195. Reply Corp., 800/955-5295, 408/942-4804.

Reader service no. 628

Aspen Aura

Notebooks used to be rigid. Upgradability was a joke. But times have changed, and typical of the new flexible approach is Aspen Computer's Aspen Aura line. You can upgrade an Aspen Aura's processor from a 486DX-25 to a 486DX2-66 or any 486 CPU in between. Screens are upgradable too; you can go from monochrome to dual-scan passive color and, when available, to active-matrix color. You can even swap the trackball with a scanner interface. Additional modules include a fax-modem, a SCSI adapter, an ethernet adapter, a PCMCIA slot, and a second serial port for scanners. Prices start at $1795 for the 486SX-25 model with a monochrome screen, a 120MB removable hard drive, and 4MB of RAM and go up to $4195 for a 486DX2-66 with a passive color screen, a 200MB removable hard drive, and 20MB of RAM. Aspen Computer, 800/472-3273, 716/626-0315.

Reader service no. 620

Outside In for Windows 2.1

WINDOWS File viewing utilities can become out-of-date quickly. If one major application introduces an upgrade with a new file format, a file viewer that was compatible with everything suddenly isn't. Systems Compatibility has done a lot of catching up with Outside In for Windows 2.1. This latest version supports 13 new formats, including WordPerfect 6.0 for DOS and Windows, PKZip 2.*x*, Microsoft Word 6.0 for DOS, Quattro Pro for Windows, and the Paradox 4.0/Paradox for Windows format. In addition, the company has added OLE support—you can now view an object inside a file, and several of the word processor viewers have been improved to display tables within documents. The product lists for $89; upgrades are $29. Systems Compatibility, 800/333-1395, 312/329-0700, 312/670-0820 (fax).

Reader service no. 621

Paint Shop Pro 2.0

WINDOWS This file conversion, image editing, and screen capture utility now supports nine more file formats (including JPEG and Kodak Photo CD), TWAIN-compliant scanners, and batch file conversion. It's fast and does some basic editing. For instance, simply click a menu selection to add a border to an image or to adjust brightness and contrast. If you need to convert a large number of files from one format to another, a single menu choice will take care of it. Even the Windows screen capture utility has been improved. To activate a full-screen capture, just click the right mouse button. While Paint Shop Pro 2.0 won't do batch printing or fancy editing, it's all many casual graphics dabblers will need. This $69 program fits on a single 3½-inch floppy disk. Jasc Inc., 612/930-9171, 612/930-9172 (fax).

Reader service no. 623

Courier V.32terbo Modems

The speed limit has been raised again on the data comm highway. U.S. Robotics has introduced seven new modems with the V.32terbo protocol, which transfers files at an uncompressed rate of 19.2 kilobits per second (kbps). All the models include a passel of features such as call selection, which automatically routes incoming data and fax calls; call-back security; and synchronous dial-in for connecting to mainframes. The base models offer data-only transmission, the middle-of-the-line products provide 14.4-kbps Class 2.0 fax, and the top-of-the-line models include U.S. Robotics' 21.6-kbps proprietary protocol along with fax and V.32terbo. Prices range from $645 to $1295. The PS/2 model, which includes fax, is $745. U.S. Robotics, 800/342-5877, 800/982-5151, 708/982-5151.

Reader service no. 622

PocketFile 105 Hard Drive

Need more storage space for your notebook? Intégral Peripherals' PocketFile 105 hard drive fits in a PCMCIA Type III ex-

Throw your Windows wide open.

Break down the walls around your Windows.™ *OS/2® for Windows* rises above the limitations of DOS, Program Manager and File Manager, unlatching a higher level of power and performance.

Add *OS/2 for Windows* to your current Windows 3.1 setup. Now you can multitask DOS and Windows programs with more speed and reliability than ever before. Print out a WordPerfect® document while you download files from CompuServe,™ without fear of the dreaded General Protection Fault. Watch your multimedia programs really sing—and dance—with incredible audio/video synch. Right from Windows, launch into 32-bit OS/2 programs that take advantage of the full power of your PC. Or break free from the confines of Windows. The object-oriented OS/2 Workplace Shell™ interface brings "drag and drop" ease to file and print management, customization and more.

HOW OS/2 AIRS OUT YOUR WINDOWS:

Brings your PC up to speed: *exploit the 32-bit power and performance of 386SX processors—and beyond.*

Increases your productivity: *run more than one program at a time with greater reliability.*

Gives you more programs to choose from: *run DOS, Windows and OS/2 programs.*

Saves you money: *no need to buy various utilities to improve Windows performance.*

$49 *promotional price**

To order or to find out more, call **1 800 3-IBM-OS2.** In Canada, call **1 800 465-7999.** *OS/2 for Windows* is also available at local software dealers. If you use Windows, this is one window of opportunity that's wide open.

Operate at a higher level.™

IBM®

*Dealer prices may vary. Offer valid in U.S.A. only, expires 2/9/94. This ad was created by LINTAS and got to this publication on time using DOS, Windows and OS/2 programs running on OS/2. IBM and OS/2 are registered trademarks and "Operate at a higher level" and Workplace Shell are trademarks of International Business Machines Corporation. Windows is a trademark of Microsoft Corp. All other products are trademarks or registered trademarks of their respective companies. © 1993 IBM Corp.

PowerViewer

It's 9:00, Monday morning and you've just learned the horrifying news. That big meeting with the president of the company next week? It's been moved up. Way, way up. And that report for the big meeting? It's due in half an hour. Fortunately, you've got PowerViewer™ for Windows™, the one tool that lets you access virtually any database and create presentation-ready reports with a few simple clicks of the mouse. You take a long sip of coffee, sit down in front of your computer and click open PowerViewer.

Access More Information.

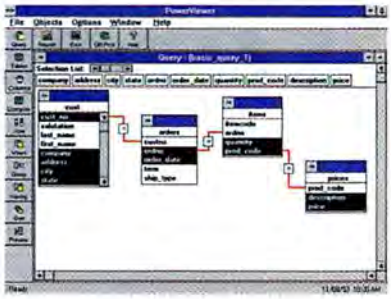
Click. Quickly, you access the Connect Profile menu and select the database you want. Because PowerViewer supports over 25 of the most popular PC and relational databases, all the information you need is right at your fingertips. And with Powersoft's Database Connection Hotline, you know any questions you have will receive immediate answers. Click. You go into the Report Painter and select the specific data for your report using one of PowerViewer's powerful point-and-click query techniques. You choose the one that suits you best, whether it's our easy-to-use QuickSelect, our powerful graphical query builder, or a query you've saved from a previous task. Click. Now you're ready to create your report. You select one of the many built-in QuickStyle templates that enable you to create stunning reports with full-color 2D and 3D graphs and charts. PowerGuides and Data Smart design tools lead you through every step and let you preview and customize any aspect of your report in seconds. Include a pie chart. Change fonts. Add colors. Pull in your corporate logo. And click, click, click — suddenly, you've created a masterpiece. PowerViewer makes information access as simple as point and click. It empowers you to make full use of your company's information and lets you do it faster and with greater ease than you ever thought possible.

Create Stunning Reports.

PowerViewer, Just $49.

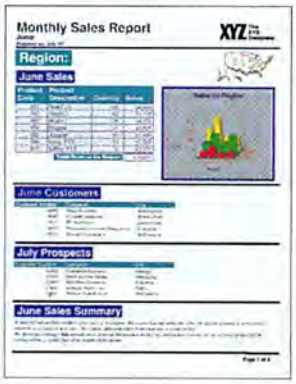
It's 11:00 and you've just come out of the big meeting. Your report was a hit. A big hit. So big, in fact, the president has asked you to run it by the entire company, gather everyone's opinions and give him a report on your findings. Under ordinary circumstances, this would be the kind of news that could ruin your entire month. Fortunately, one of your colleagues has PowerMaker™ for Windows, the tool that gives you all the functionality of PowerViewer plus the power to design fully-interactive forms, manipulate databases and create complete Windows-based applications in no time.

Click
Click



Click
Click
Click
Click

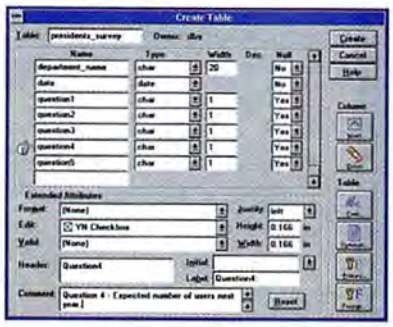
Click
Click
Click
Done



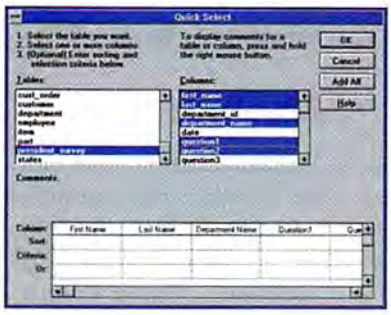
POWERSOFT ENTERPRISE SERIES™

Prices subject to change without notice and do not include sales tax, shipping or handling.
All trademarks and registered trademarks are property of their respective owners.

Click
Click



Click
Click
Click



Click
Click
Click
Click
Done

PowerMaker

Build Applications Too.

Click. You open PowerMaker, access the Connect Profile menu and select a database to capture responses to your employee survey. You can use the powerful WATCOM™ SQL relational database that's included in PowerMaker or select any other database on your network. Then, with the touch of a mouse, you access the Database Painter and PowerMaker guides you painlessly through creating your database layout. Click. Next, you access the Form Painter. Another touch of the mouse links your database to the survey form you're about to create. Then, just like when you created your report earlier, you simply choose a QuickStyle form template, layout your survey and customize it in seconds. Edit text. Rearrange questions. Add toolbars. Bring in all the bells and whistles. In minutes, you've created your very own Windows application.

PowerMaker, Just $99.

Click. Now, it's time to distribute your application to the world. PowerMaker not only enables you to share your applications with everyone on your network; it lets you do it without any user runtime fees. So you just put your "President's Survey" on the network and tell your colleagues it's coming. They simply click open the icon and fill in the blanks. Your database is updated automatically. All you have to do is go in and create your final report. And you already know how easy that's going to be. PowerMaker lets you take the power of PowerViewer a step further, helping you build and distribute your own form-based applications, as well as update databases. With PowerMaker, you can create living, breathing Windows applications that your entire department can use. And you can do it all by yourself in just a few short minutes.

Call 1-800-273-2841 Today.

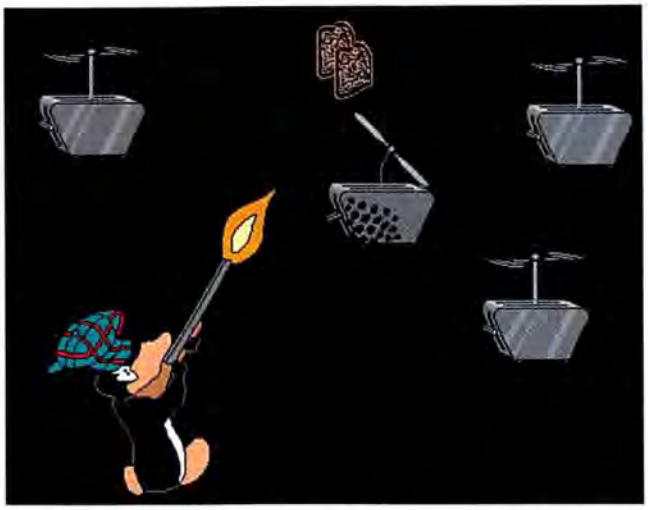
Of course, this scenario is merely a reenactment of the typical office crisis. But the fact is, PowerViewer and PowerMaker make accessing the information you need, producing stunning reports, and even creating and distributing your own Windows applications as simple as point and click. And right now, these tools are not only incredibly easy to use. They're also incredibly easy to buy, because we're offering them to you at special prices of just $49 for PowerViewer and $99 for PowerMaker. And each is backed by Powersoft's 30-day satisfaction guarantee. To order PowerViewer and PowerMaker today, simply contact your corporate reseller, stop by CompUSA or call Powersoft directly at **1-800-273-2841.**

Powersoft™

A New Kind of Power for a New Kind of Computing

pansion slot and packs 105MB of storage on a 10.5mm card. The PocketFile is designed as a secondary drive for today's notebooks (which typically have internal hard drives) or as a primary storage device for the next generation of subnotebook and hand-held PCs. It offers 15ms access time, which is comparable to that of today's desktop hard drives. The PocketFile is bundled with a protective carrying case and retails for $750. Intégral Peripherals, 303/449-8009, 303/449-8089 (fax).

Reader service no. 632



OUTLAND-ISH BEHAVIOR: In the Opus 'n Bill Screen Saver, Opus the Penguin shoots down propeller-driven toasters.

The Far Side Daily Planner, Intermission 4.0, and the Opus 'n Bill Screen Saver

WINDOWS Delrina seems committed to putting fun into computing, and judging from three new programs, they're doing it with an attitude. The Far Side Daily Planner is an update of the Far Side Calendar, with a new set of cartoons and a few practical improvements. These include an address book, text search, and the capability to import and export text. Not so practical are the new sound effects and Monday cartoons in color. Delrina has also bought ICOM Simulations' Intermission screen saver. Intermission 4.0 offers a morphing utility, 3-D ray-traced animations, interactive games, and disco dancing pigs. Delrina's strangest new entry is the Opus 'n Bill Screen Saver, based on Berkeley Breathed's *Bloom County* and *Outland* comic strips. In 16 screen-blanking animations, Opus the Penguin and Bill the Cat shoot at helicopter toasters, swim in fishbowls, and ponder the most important thing in life, which can't be published in this magazine. The Far Side Daily Planner lists for $59.95, Intermission 4.0 for $39.95, and Opus 'n Bill for $44.95. Delrina, 800/268-6082, 206/823-0568 (fax).

Reader service no. 627

SmartPrint Starter Kit

If your office has two PCs and a printer, you probably need a low-cost printer sharing system rather than a full-blown peer-to-peer network. SmartPrint is an inexpensive way to connect as many as 32 computers and printers. The Starter Kit includes two computer modules, one printer module, a power supply, and two 25-foot lengths of wire with standard modular phone (RJ-11) plugs. The package offers a 500-kbps data transfer rate and works with all Windows applications, according to the vendor. The SmartPrint Starter Kit costs $199. Dresselhaus Computer Products, 909/945-5600, 909/989-2436 (fax).

Reader service no. 631

Memory Commander 4.0

Memory Commander 4.0 has a new help system that the company claims is the most extensive of any memory manager. You don't have to remember to optimize Memory Commander after adding new drivers or RAM-resident programs; it detects these changes and asks you if it should reoptimize. Memory Commander also retains its main claim to fame: It increases your conventional RAM beyond what its competitors can do. It can turn your lower 640K into as much as 920K, improving performance for large, text-based DOS apps. You can't run Windows or other graphics programs when using this configuration, but Memory Commander can automatically switch to a less expansive mode when you want to go graphic. It lists for $99.95. V Communications, 408/296-4224, 408/296-4441 (fax).

Reader service no. 626

WinBook 486SX

If you need a light, affordable 486 notebook, consider Micro Electronics' new WinBook. Sporting an energy-saving Intel SL-enhanced 25-MHz 486SX processor and weighing only 5.4 pounds, the WinBook incorporates the PicoPower Evergreen HV chip set. This chip set integrates battery and power management and extends the life of the nickel–metal-hydride battery. (An optional second battery is available for $79.95.) This sleek-looking note comes with 4MB of RAM expandable to 32MB and a 200MB or 340MB hard drive. It includes a convenient on-board trackball centered below the keyboard and has a 10-inch backlit monochrome display. The WinBook also incorporates a 9600/2400-bps internal fax-modem and a Type II PCMCIA slot. It costs $1699; a dual-scan color model is $2399. Micro Electronics, 800/468-2162.

Reader service no. 624

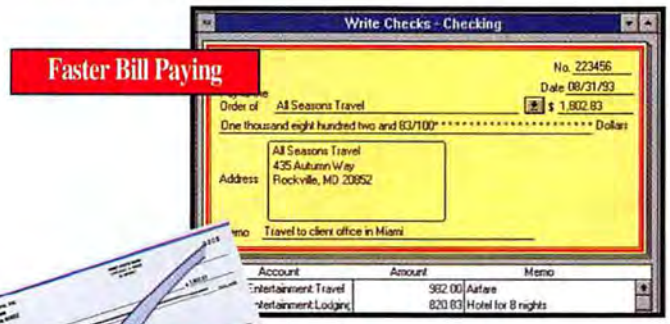
Picture Prowler

WINDOWS If you work with lots of graphics files, you know how difficult keeping track of all those images can be. Xing Technology's Picture Prowler can save time and aggravation by helping you manage image files. This Windows-based program compresses images in industry-standard JPEG format, lets you assign keywords to files, and groups files under topics. Picture Prowler also provides thumbnail views for quick access to images. It gives you control over final image quality, letting you crunch images to 1/10, 1/20, or even 1/100 their original size. Picture Prowler imports TIFF, BMP, and GIF files and can export native JPEG files to those formats as well. Picture Prowler lists for $49.95. Xing Technology Corp., 800/294-6448, 805/473-0147 (fax).

Reader service no. 629

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

HEY, QUICKEN USERS! GET THIS.



Faster Bill Paying

Instant Invoicing

Instant Accounts Payable

Automatic Accounts Receivable

A Complete, Accurate "Information Central" For Your Business

All Your Business Information Organized In One Place

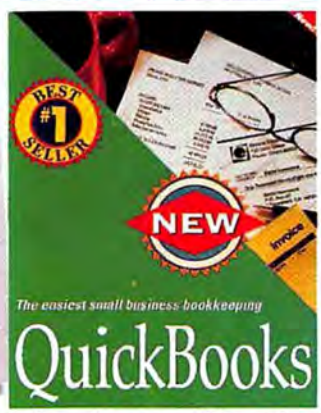
Accounts Payable Management
- Accounts Payable Aging
- Sales Tax Owed Report
- 1099 Report

Accounts Receivable Management
- Accounts Receivable Aging
  - Detailed Collections Report
  - Sales Reports

Business Reporting
- Cash Flow Forcast
- Profit and Loss Statement
- Balance Sheet
- Payroll Report
- Project Tracking
- Custom Reports

Business Lists
- Customer names, addresses, phone numbers
- Complete vendor information
- Products
- Services
- Prices and part numbers
- Jobs, projects
- And much more

New Version 2.0! Choose DOS or Windows.



QuickBooks® is complete business bookkeeping, easy as Quicken,® from the makers of Quicken. Simply pay bills and create invoices with QuickBooks, and it does all the rest for you. Just start using it the next time you have bookkeeping to do, and soon you'll be getting all the information you need to collect receivables faster, manage cash flow better and make more profitable business decisions. The first of which you can make right now, by calling to order at this special price.

Quicken Users: Pay only $69.95 Save $90!

Off the suggested retail price of $159.95. Or buy QuickBooks at retail and mail us the coupon in the box for your $25.00 Quicken users rebate. Either way your price should be about the same. First-time Intuit customers save too! Pay only $99!

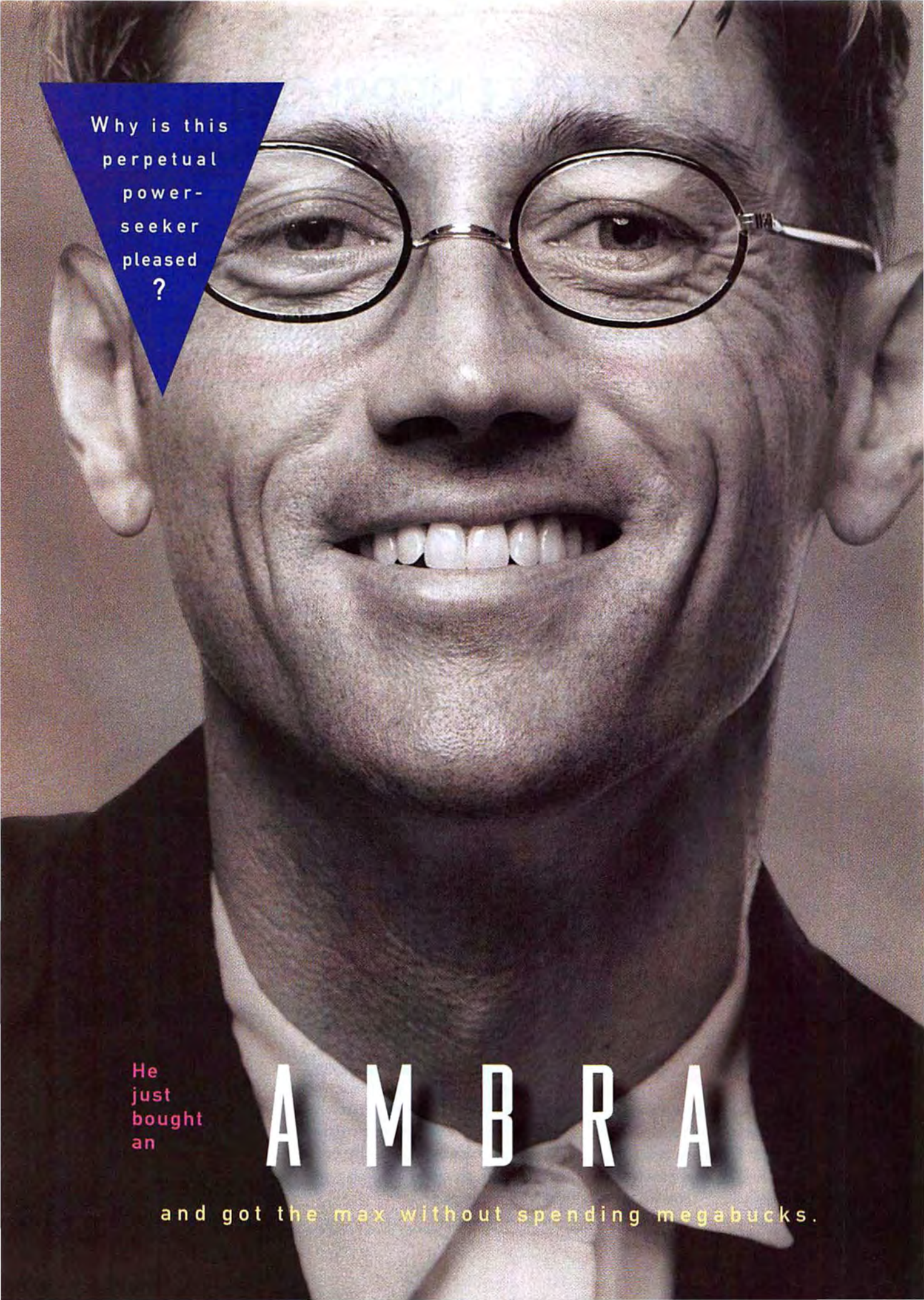
No-risk guarantee:
If you're not satisfied for any reason, simply return QuickBooks within 60 days for a full refund.

Call 1-800-624-8742

To order 24 hours a day, 7 days a week.
$8.00 shipping & handling will be added to your order.
Additional international charges apply.

Expires 4/30/94 Ad Code: PW1G6

System requirements: DOS: IBM® compatible PC, 640K RAM, DOS 3.0 or higher, 3.2 MB free on hard disk. Windows: IBM® compatible PC, 386 or higher, 2MB minimum (4MB recommended), Windows 3.1 or higher, 8 MB free on hard disk, VGA or better monitor. Works with any printer supported by Windows. QuickBooks and Quicken are registered trademarks of Intuit. ©Intuit 1993.


Why is this perpetual power-seeker pleased ?
He just bought an
AMBRA
and got the max without spending megabucks.

SPLIT-NANOSECOND NUMBER CRUNCHING.

100 MIPS

Doing complex financial modeling? CAD/CAM? Advanced applications of any kind? AMBRA puts the superior power of a **60 MHz Pentium processor** at your command! This true 64-bit Intel processor has what it takes — high-speed clocking, parallel execution, on-chip cache, specialized floating-point hardware, and more — to swiftly cut through your most intensive computing tasks.

IF you crave computing power, call AMBRA. For the latest technology — like Intel® PENTIUM.™ And lots more. For lots less.

CACHE
floating-point unit

AMBRA™

Pentium + PCI + Diamond Viper
Fully configured systems starting at **$3,099**

OPEN-THROTTLE THROUGHPUT

32 bits wide and 33 MHz fast,

PCI carries a payload of

132MB of data per second!

PCI local bus

Say goodbye to I/O jams and hello to a jumperless future — at AMBRA, the PCI local bus has arrived!

In our Pentium processor-based ISA desktops, this heavy-load CPU-to-peripheral data carrier:

- Increases throughput
- Autoconfigures PCI adapter cards
- Provides a strong expansion base for high-performance peripherals

Networks

Multimedia

Disk drives

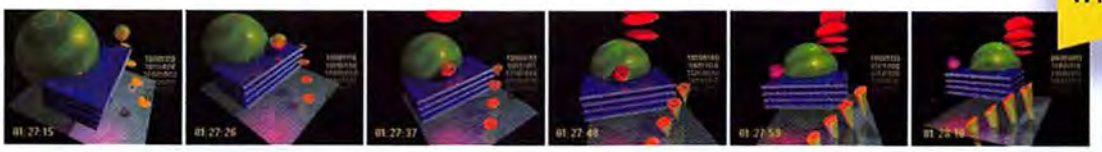
VESA local bus

Prefer VESA over PCI? AMBRA's selection of Pentium technology systems includes towers and desktops to suit.

Step up to Pentium processor power while protecting your investment in VESA option cards you may already have.

WARP-SPEED GRAPHICS. If you're talking accelerated graphics, AMBRA's talking 81 million Winmarks![1] with the ***Diamond Viper PCI*** video card! This high-powered PCI graphics board provides 24-bit True Color (up to 16 million hues!), fast and flicker-free refresh rates, and super-rapid screen redraws. For VESA fans, AMBRA also has the Viper in a VL version. In addition, we offer the popular ***ATI® Mach 32 VL*** graphics accelerator.

81 MILLION WINMARKS



1 • 8 0 0 • 2 3 9 • 5 4 0 9

Circle 127 on reader service card

HARD DISKS:

1GB (8.9 ms) SCSI-2

540MB (10.5 ms) SCSI-2

440MB (12 ms)

340MB (12 ms)

240MB (15 ms)

170MB (17 ms)

MULTIMEDIA:

2X CD-ROM drive

Multimedia kit (2X CD-ROM drive, sound card, 2 speakers)

MONITORS:

14" AMBRA SVGA

14" AMBRA UVGA

15" AMBRA Flat Square Tube

15" NEC Multisync® 4FGE

17" AMBRA Flat Square Tube

17" NEC Multisync 5FG

21" NEC Multisync 6FG

MODEMS:

9.6 kbps internal

14.4 kbps internal

PRINTERS:

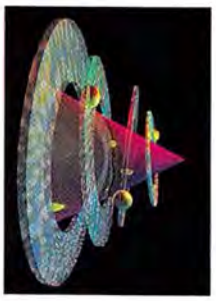
IBM 2391 Personal Printer II

IBM 4039 LaserPrinters

IBM 4029 LaserPrinters

SCANNER:

Calera WS Complete PC Scanner



EXPONENTIAL GROWTH

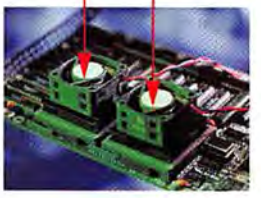
MAYBE YOU NEED A SYSTEM THAT'S BIG, BIG — AS WELL AS FAST, FAST. WE'VE DESIGNED A **DUAL PENTIUM PROCESSOR COMPLEX** THAT ALLOWS YOU TO DOUBLE YOUR COMPUTING POWER WHENEVER YOU CHOOSE.

We build TO YOUR SPECS for memory, storage, and more. And if one Pentium processor isn't enough, take TWO!

POWER²

OUR DUAL COMPLEX IS AVAILABLE IN EISA TOWERS THAT OFFER 8 SLOTS AND 12 BAYS TO BUILD UPON.

You can begin with one Pentium processor, then add another later. Say, when you're ready to tap the multi-processor support in an operating system like UNIX or Windows NT.™ If you're ready now, we'll create a dual-powered system for you without delay.



Pentium
+ VESA
+ 1GB hard disk

Fully configured systems starting at

$4,351

open-ended expansion. Require big-byte storage? We've got hard disks ranging up to **1GB!** Need to run a dozen high-speed peripherals? You can support as many as 14 drives and devices on a single slot, thanks to **built-in Fast SCSI-2!** Our Pentium processor-based ISA/PCI systems come with a Fast SCSI-2 controller **(10MB/sec throughput!)** on the PCI local bus. EISA/VESA systems feature onboard, **dual-channel** Fast SCSI-2.

Affordable Intel Pentium processor-based systems from AMBRA.

1 Model DP60/PCI

- Pentium processor, 60 MHz
- 64-bit data path
- 8MB RAM, max: 128MB
- 256KB processor cache
- 3.5" 1.44MB diskette drive
- 340MB (12ms) hard disk
- 4 ISA, 2 PCI, 1 PCI/ISA slot
- 6 storage bays
- PCI graphics accelerator, 2MB DRAM
- 14" SVGA color monitor, LR
- Desktop casing
- 200-watt power supply
- MS-DOS® 6.0, Windows 3.1, mouse

$2,799

2 Model DP60/PCI to the max, with:

- 440MB (12ms) hard disk
- Diamond Viper PCI, 2MB VRAM
- 2X CD-ROM drive
- 15" Flat Square color monitor, LR, NI

$3,499

3 Model DP60E/VL

- Pentium processor, 60 MHz
- 64-bit processor complex
- 8MB RAM, max: 64MB
- 256KB processor cache
- 3.5" 1.44MB diskette drive
- 540MB (10.5ms) Fast SCSI-2 hard disk
- Onboard dual-channel Fast SCSI-2
- 8 EISA slots (2 VESA)
- 6 storage bays
- L45 ATI® Mach 32, 2MB VRAM
- 15" Flat Square color monitor, LR, NI
- Desktop casing (convertible to minitower)
- 200-watt power supply
- MS-DOS® 6.0, Windows 3.1, mouse

$3,999

4 Model TP60E/VL[3]

- Pentium processor, 60 MHz; upgradeable to dual processors
- Dual 64-bit processor complex
- 8MB RAM, max: 128MB
- 512KB processor cache
- 3.5" 1.44MB diskette drive
- 540MB (10.5ms) Fast SCSI-2 hard disk
- Onboard dual-channel Fast SCSI-2
- 8 EISA slots (2 VESA)
- 12 storage bays
- L25 S3 805 graphics accelerator, 1MB DRAM
- 2X CD-ROM drive
- 15" Flat Square color monitor, LR, NI
- Tower casing
- 350-watt power supply
- MS-DOS® 6.0, Windows 3.1, mouse

$4,719

intel inside

FIRM CONFIDENCE.

AMBRA covers every computer with a 30-day money-back guarantee and a one-year limited warranty. An optional IBM® one-year onsite warranty is also available to you.[2] With either warranty, you can rely on toll-free technical support 24 hours a day, 7 days a week.

In Canada,[4] call 1-800-363-0066, Ext. 5409

FREE CUSTOMIZATION. THE SYSTEMS YOU SEE HERE ARE JUST SOME OF YOUR CHOICES. AMBRA CUSTOM-CONFIGURES TO YOUR EXACT SPECS — PREINSTALLING AND/OR PRELOADING YOUR PICK OF MEMORY SIZES, HARD DISKS, OPTION CARDS, AND MORE — WITH NO EXTRA SERVICE CHARGE AND NO DELAY.

Full convenience.

To place an order or get more information, just call. AMBRA's lines are open every weekday 8 am to 9 pm, and Saturday 10 am to 6 pm (ET). We accept VISA,® MasterCard® and American Express®— as well as purchase orders from qualifying businesses. So pick up the phone, and get a direct line to Pentium processing power today.

AMBRA COMPUTER CORPORATION

1 ■ 8 0 0 ■ 2 3 9 ■ 5 4 0 9

[1] 1,024 x 768 x 256 colors at a 72 Hz refresh rate. [2] Please call for details regarding AMBRA's money-back guarantee and limited warranty, and IBM onsite warranty. Return shipping and insurance charges are the responsibility of the customer. Onsite service may not be available in certain locations. [3] FCC Class A system, for use in a commercial environment only. [4] Offerings may differ in Canada.

© 1993 AMBRA Computer Corporation. AMBRA is a trademark of ICPI Ltd. and used under license therefrom. The AMBRA logo and logotype are trademarks of AMBRA Computer Corporation. IBM is a registered trademark of International Business Machines Corporation. Intel is a registered trademark and Pentium is a trademark of Intel Corporation. Windows and Windows NT are trademarks and MS-DOS is a registered trademark of Microsoft Corporation. All other product names are trademarks or registered trademarks of their respective suppliers. Offerings, prices and products are subject to change without prior notice. Prices do not include shipping.

Circle 127 on reader service card

THE BEST BUY PCs in this superfast company range from the robust $4999 Pentium IBM ValuePoint P60/D to the inexpensive $2385 Netis N4D266VL 486DX2-66.

PCs for the Power Hungry

Pentiums vs. 486DX2-66s

Compared to top-of-the-line 486DX2-66s, are Pentiums good values or overpriced? That's the question we ask this month when reviewing the first 60-MHz Pentiums and the fastest 486 PCs.

By Rex Farrance

STAN MUSILEK

Admit it—all those recycled paper clips and file folders aren't just for the environmental effort. You're saving your pennies, aren't you. Feeding that secret fantasy of owning the ultimate in hot, *expensive* desktop iron. If your fantasies are anything like ours, you're envisioning a powerhouse loaded with the RAM and storage to handle Windows NT, OS/2, and other demanding graphical applications. You've heard all the promises about Pentium power. The question is, can you afford the price? And are Pentiums worth the extra cost? Well, yesterday's fantasies have just materialized into some of today's best deals.

To see what kind of machinery you can find at the high end, we set out to review business offerings from a double-dozen prominent vendors. Of course we specified high-performance computers. And we got them: Acer, ALR, Compaq, and IBM PC Company sent us four of the first available 60-MHz Intel Pentium PCs. Twenty other vendors sent 486DX2-66s—the pre-Pentium top-dog performers. Ironically, the lowest-power PC in our roundup came from the

Testing by Ulrike Diehlmann and Susan Silvius; research and support by Dawn Furseth

same vendor that provided the fastest Pentium—ALR. It delivered the sole DX2-50.

Clearly, vendors are facing up to power users' needs. No machine came with less than 8MB of RAM, and almost half came with the 16MB needed to run Windows NT. Today's graphical applications put the pinch on disk storage, and system vendors have responded by beefing up the standards. Only four companies sent hard disks smaller than 340MB, and more than half the systems came with 400MB or more of storage. Unisys's model came with a humongous 1.2GB SCSI drive!

Pentium Power

Considering the muscular configurations, we expected great performance, and we weren't disappointed: This group of systems recorded better benchmarks than any PC group we've seen. Only five of the systems ran significantly slower than our 486DX2-66 historical average, and one of them was the DX2-50. The new 60-MHz Pentiums were the fastest machines by far, outrunning all the 486s. ALR's Evolution V—the speed leader—ran our benchmarks about 35 percent faster overall than our quickest DX2-66 and 50 percent faster than the average. As we had expected, the Pentiums clustered in a bunch at the top of the chart.

But Pentiums still cost too much for everyday business, right? That depends on whose Pentium you buy. The ALR Evolution V and the Best Buy IBM ValuePoint P60/D come in around $5000 each—not bad for your ultimate powerhouse. But if you still feel you can't afford Pentium, the 486DX2s provide a lower-cost alternative. The price dips below $2000 on the least expensive system here—Blackship's BLK 486/66LB. And three of our five 486DX2-66 Best Buys cost less than $3000, while the other two are priced around $3300.

A late note on price: As this issue went to press, several vendors reported significant price reductions. The Acer and ALR Pentium models, for example, dropped to $5395 and $4955, respectively. So if a particular PC is high on your wish list but appears to be priced out of reach, don't despair. It's worth calling to see if the machine is now available at your price point.

More Pentiums Coming—For Less

If your heart is set on Pentium even though you can't afford $5000, be of good cheer: You may have your 64 bits' worth sooner than you think. Too late for this review, Gateway 2000 hit the market with its P5-60 systems. With 8MB of RAM, a 424MB hard disk, and a 14-inch monitor, a P5-60 is direct-priced at just $2995; with 16MB of RAM, a 528MB hard disk, and a 17-inch monitor, it costs $3995. In addition, Ambra, Compaq, and Dell were announcing affordable Pentium models as this article went to press.

We'll bet that this sighting is just the tip of the Pentium iceberg. Expect prices to drop on the early Pentiums reviewed here, and keep an eye out for competitively priced models from other major vendors. You'll continue to pay a premium over 486DX2s, both for the current 60-MHz Pentium models and for the 66s to come. But the gap between this next-generation processor and the 486DX2 is already narrowing. In addition, as Pentium production ramps up, you'll see DX2 prices drop below even today's affordable levels.

New Fast Processors Coming

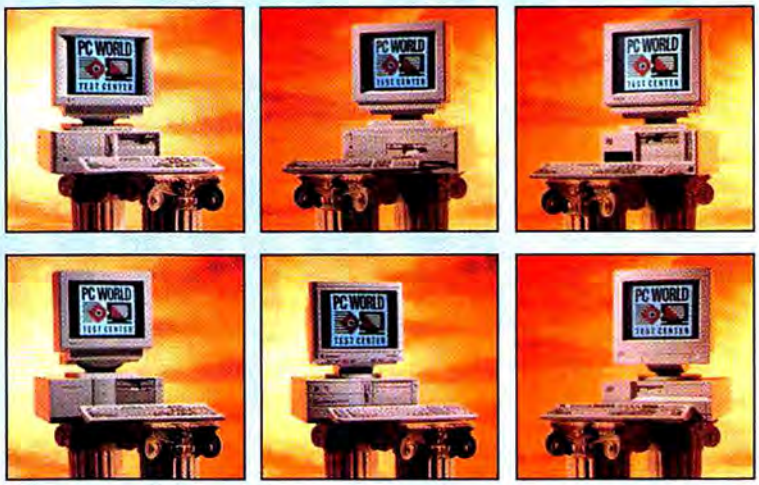
Intel will toss its next card on the table soon after you read this—the new clock-tripled 486 CPU that will process at an impressive 100 MHz. Like DX2 processors, this CPU will communicate with secondary cache, system RAM, and mass storage at the 33-MHz clock speed of the motherboard. Expect to see this processor appearing in systems from major vendors in the first half of 1994.

IBM is playing its new gambit even before Intel's next CPUs arrive. The company's Blue Lightning is already available in a 66-MHz clock-doubled version. In addition, 75-MHz and 99-MHz clock-tripled versions will hit the market soon, with the 75 MHz representing IBM's first bet. So within six months, expect to see another showdown for the high-performance crown.

Best Buys

Sure, you expect a Pentium to blow away a 486 when it comes to performance—but you'd also expect this kind of brand-new technology to carry a prohibitive price. Fortunately, today's buying climate has convinced vendors like IBM to pack their hot new Pentium PCs full of cool value. In IBM's case, such diligence was rewarded with the first Best Buy we've awarded to a Pentium PC.

1. **Netis N4D266VL** *pg. 146*
2. **Zeos 486DX2-66** *pg. 148*
3. **Comtrade EISA VL-Bus Professional 66** *pg. 140*
4. **Dell Dimension 466V/XPS** *pg. 141*, **Gateway 2000 4DX2-66V** *pg. 142*, **IBM ValuePoint P60/D** *pg. 142*



CLOCKWISE FROM TOP LEFT: Netis N4D266VL, Zeos 486DX2-66, Comtrade EISA VL-Bus Professional 66, Dell Dimension 466V/XPS, Gateway 2000 4DX2-66V, and IBM ValuePoint P60/D.

Major Vendors Flex Their Muscles

In this review of high-end performance PCs, familiar names surge to the head of the pack. Dell, Gateway 2000, IBM, and Zeos nail down four of six Best Buys, and NEC just misses. When you think about it, that's not too surprising. We're talking about power equipment, and these vendors made their names with top-end designs. So it stands to reason that in the current competitive environment, these giants would trim profit margins and take a hard look at what customers need.

Top-tier vendors usually generate their own designs and either manufacture their own motherboards or have them produced to spec. Smaller vendors, on the other hand, tend to buy off-the-shelf components and assemble their PCs. Even the biggest vendors, however, leave the manufacture of hard and floppy drives (and often the video components) to specialist companies.

The advantages of designing a system from the ground up become evident when you pop the top off a PC case. Machines from first-line companies generally have neater interiors—well laid out with easy access to RAM, secondary cache, expansion slots, and storage bays. Cables and wires are bundled neatly out of the way. Smaller manufacturers rarely compete well when it comes to accessibility and aesthetics.

Cost is another matter. Generally speaking, you'll pay extra for top design—and for many buyers, the difference is well worthwhile. The price gap has narrowed dramatically over the last couple of years, but it's still significant to dollar-conscious buyers.

Designing for Expandability

We've come a long way from the days when 2MB of RAM was the high-performance computing standard. But many motherboards still employ the same 30-pin sockets and single in-line memory modules (SIMMs) that were in vogue when the first standard SIMMs appeared. A PC whose motherboard uses these older sockets almost always has two banks of four sockets. Each bank must be filled with SIMMs of the same capacity. That means the sockets of an 8MB system will be filled with 1MB SIMMs. To upgrade, you have to discard four 1MB SIMMs and add four 4MB SIMMs. That gives you 20MB of RAM in your system and 4MB in your hand.

The newer 72-pin SIMM sockets don't impose the same limitation. An 8MB system will usually have two 4MB SIMMs or one double-sided 8MB SIMM. In either case, more sockets remain free for expansion. And there's no need to fill sockets in groups. Since 4MB, 8MB, and 16MB 72-pin SIMMs are all easily available *and* you can ordinarily mix and match capacities, these newer sockets give you unparalleled flexibility, limited only by the configurations the motherboard supports. If you're a power user, however, you'll want to buy your system with high-capacity SIMMs that leave sockets free for expansion.

The systems in this review broke about even on 30- versus 72-pin memory; two-thirds of the 30-pin systems had all their SIMM sockets filled. All else being equal, we prefer systems with the 72-pin setup. And we suggest you never buy a 30-pin system in an 8MB configuration unless you plan never to upgrade memory. Buy 16MB instead: You'll have more RAM to begin with, plus four sockets waiting for you to add even more later. We anticipate that motherboards with 30-pin sockets will disappear from the market over the next year or so, although you'll still be able to buy 30-pin SIMMs. A

Best Performance

No surprises here. The Pentiums really do the job, claiming positions one through four. The top-rated ALR outran the speedy NEC Image 466es (the fastest of 20 DX2-66s) by an impressive 35 percent! 486DX2-66 speedsters from Gateway, Zeos, National MicroComputers, and Acma just missed this list.

1. **ALR Evolution V** *pg. 136*
2. **IBM PC Company ValuePoint P60/D** *pg. 142*
3. **Compaq Deskpro 5/60M Model 510/1020/w** *pg. 150*
4. **AcerPower Series 9000** *pg. 134*
5. **NEC Image 466es** *pg. 146*

Best Price

No Pentiums on this list, but a few surprises. Blackship's DX2-66 is direct-priced at an astounding $1995! And the most expensive models on this short list—the Diamond and Insight—cost a mere $2799. Not bad for top-end equipment.

1. **Blackship BLK 486/66LB** *pg. 140*
2. **Netis N4D266VL** *pg. 146*
3. **CAF Master L737 DX2/66** *pg. 150*
4. **Tagram Concerto Hi-Note 486DX2-66** *pg. 148*
5. **Diamond DT 486DX2-66 VL-SCSI** *pg. 141*, **Insight 486DX2-66 Smart Server** *pg. 143*

Best Service and Support

Long warranties are the story: 36 months from Compaq and NCR; 24 months from Tagram; and 24 months parts, 60 months labor from Polywell. Responsiveness counts too: Buyers vote with their wallets, and companies have to listen.

1. **Compaq Deskpro 5/60M Model 510/1020/w** *pg. 150*
2. **NCR System 3333** *pg. 143*
3. **Tagram Concerto Hi-Note 486DX2-66** *pg. 148*
4. **Nat'l MicroComputers Universal Pro-System** *pg. 143*
5. **Netis N4D266VL** *pg. 146*, **Polywell Poly4586-66VC** *pg. 148*

final word: Even if you *think* you'll never need more than 8MB of RAM, you never know when your needs will change.

Upgrade Issues and Processor Dead Ends

Despite the allure of Pentium, systems built around the 486DX2-66 are still the business user's main power system. As this review shows, you still get a big price break on DX2s over Pentium boxes, and an affordable 486DX2-66 local bus PC is no slouch when it comes to recalculating a giant spreadsheet. The first 486DX2-66s lacked an upgrade path; fortunately, those DX2-66s are still powerful machines (as you know if you bought one), and they'll continue to stand up well to demanding business applications.

The upgrade picture remains hazy for the current crop of DX2-66s, but Intel assures us that a Pentium OverDrive will be ready soon. According to the processor giant, you'll be able to upgrade systems *if they have the correct design specifications and 238-pin CPU sockets*. Intel is now touting its own Pentium-ready certification process, which will allow vendors to earn the Intel system-upgradability stamp of approval. The additional paperwork isn't gladdening vendors' hearts, but most major manufacturers will probably go along. What can consumers expect? If they're lucky, guaranteed upgradability. Even with that in mind, the best advice for most users remains the same: Buy a PC with a processor that can handle your applications for the foreseeable future.

Pentium systems—with the exception of Compaq's Deskpro 5/60M with its modular CPU-card construction—generally have no apparent upgrade path. Since these computers are the fastest PCs yet developed, however, it's unlikely that application power demands will outstrip their ability to deliver anytime soon.

Performance PCs on the Fast Track

Pentium systems from ALR, IBM, Compaq, and Acer ranked one through four, respectively, on the PC World Test Center's applications test suite. The IBM unit trailed the leading ALR Pentium by a minimal 10 percent overall, while the Compaq and Acer units came in about 25 percent behind the leader. The 486DX2-66s are still powerful PCs, and they also looked good, with the NEC Image 466es posting the fastest numbers, about 35 percent behind ALR's Pentium. Systems from Gateway 2000, Zeos, National MicroComputers, and Acma packed in so close to the NEC, we doubt you could perceive the difference in overall speed. Benchmarks on the 12 top 66s varied by just 13 percent. To no one's surprise, the 486DX2-50 ALR Flyer VL 4/50d brought up the rear, about half as fast as its Pentium stablemate.

Service That Stays With You

As always, service and support counts big. The top-tier vendors stand very strong in this area, although only two actually earn a service-and-support icon. Compaq and NCR both offer impressive 36-month warranties and 24-hour toll-free technical support. Smaller companies fill out the balance of our top group. Tagram, National MicroComputers, Netis, and Polywell provide the balance of warranty and service and support it takes to win top honors. Netis and Polywell tie for fifth position, so we award six icons this month.

Industrywide, there's a trend of longer warranties: AST, Compaq, Comtrade, NEC, and NCR all cover repairs for an outstanding 36 months. And the Ares, Polywell, Tagram, and Tri-Star machines come with 24-month warranties (Polywell covers labor for 60 months, while ALR covers parts for the same length of time). Of our 25 machines, 18 come with at least a year of free on-site service; another 5 charge $80 or less for the first year. Only CAF and Insight fail to provide an on-site–service option.

Barring equipment failure, the support you'll most likely need is some timely advice. You should put the emphasis on timeliness, and demand accurate answers. It's rare to have to pay the toll for system support calls these days, and all the companies here except

AcerPower Series 9000

VITAL STATISTICS

Street price: $5800
Processor: Intel Pentium-60
PROS: Fast, 520MB hard drive, 17-inch monitor
CONS: Flimsy inner case, single-speed CD ROM drive
Contact: Acer America Corp., 800/733-2237
Reader service no. 673

When you pay over $5000 for a system, you expect a lot in return, even if it's a Pentium PC. And the AcerPower Series 9000 delivers an impressive assortment of high-class features, including an EISA/VESA bus, a Pentium-60 CPU, 16MB of RAM, and a jumbo 520MB hard drive. In addition, you get a lovely 17-inch AcerView 76i monitor and a Diamond Viper local bus graphics accelerator with 2MB of VRAM.

The AcerPower Series 9000 provides Pentium performance, outpacing our average 66-MHz system by 27 percent overall. One local bus slot and six EISA slots are free, along with two externally accessible drive bays. But 4MB SIMMs fill all the 72-pin sockets. On a powerhouse like this, you may want a future RAM upgrade—especially if you move to OS/2 or Windows NT—and you don't want to have to discard paid-for RAM. So we suggest buying this system with a single 16MB SIMM installed; even if it costs extra now, you'll save in the long run.

You don't need any tools to open the case, although the uninitiated may find the procedure awkward. And the inner case is unusually flimsy; to keep internal components from flopping around, always replace the cover before moving the PC.

Acer's service and support is very good overall and includes a year of free on-site service. Technicians fielded our calls ably on Acer's round-the-clock support line, and the longest hold time was 5 minutes. Our biggest complaint concerns the single-speed Sony CD ROM player, which is based on first-generation technology. If you're interested in running tomorrow's multimedia applications, you'll need a second-generation double-speed drive. Make sure you buy one that can sustain transfer speeds in the neighborhood of 300K per second. While the AcerPower Series 9000's capacious hard disk and super video setup tend to mitigate its high price, the Best

CAF have 800 numbers. All the vendors provide free support for the life of the machine, with the curious exception of Unisys, which gives just 90 days.

We base our service-and-support evaluations on company policies and on calls we make simulating technical problems. Last October we began publishing a monthly fax-back service-and-support survey. In our March issue, we'll begin using information from these evaluations to supplement our other research.

The Best of the Best

We're seeing a growing number of good values in our reviews. More than two-thirds of the top systems reviewed here rate within 10 percent of each other. In fact, the leading systems bunched so closely, we had to award six Best Buys! High prices did hurt the Pentium machines' cost ratings, although not too badly. Among the Pentiums, only the Compaq Deskpro 5/60M—handicapped by its steep $7200 price—misses a good value rating. And the Pentium IBM ValuePoint P60/D, with a reasonable $4999 price, earns a fourth-place Best Buy. This PC, buoyed by super performance, terrific expandability, and fine service and support, is also the first production system we tested equipped with the fast PCI expansion bus.

The best systems bunched so closely, we had to award six Best Buys, including one to the IBM ValuePoint Pentium PC.

All the other Best Buys are DX2-66s—illustrating this processor's power on the business PC high ground. Earning another chunk of fourth place, the Dell Dimension 466V/XPS combines superior expandability and performance with a reasonable price and good service. Gateway 2000's 4DX2-66V has a very good price and is still one of the fastest, most expandable machines on the market. A steady recovery of Gateway's service rating provided the final push, earning this PC the last piece of our three-way tie for fourth place.

Comtrade's EISA VL-Bus Professional 66 stands alone as our third-ranked Best Buy, earning this honor primarily with a great combination of flexible expandability and a 36-month warranty. The Zeos 486DX2-66, with simply torrid performance, an outstanding price, and fine service, is our number two Best Buy. In the top spot is the Netis N4D266VL, a system that combines a mind-boggling $2385 price with first-quality service and support. None of our Best Buys offer less than 340MB of hard disk storage, and both Comtrade and Zeos provide more than 500MB. In addition, Dell, Gateway, and IBM all provide a hefty 16MB of RAM.

Our Best Buys are not the only fine buys. Consistently in our recent reviews, a fair percentage of PCs have presented very good values. This review is no exception, and just a half-step behind the Best Buys are 486s from Ares, NEC, National MicroComputers, and Diamond, and ALR's Pentium powerhouse Evolution V—the fastest in the roundup. That brings us back to the question of whether lightning-quick Pentium systems are worth their extra cost. Considering the IBM ValuePoint's Best Buy showing and the ALR Evolution V's high ranking, we have to just say yes.

Rex Farrance is an associate editor for PC World. *He can be reached on PC World Online (see page 12 for contact information).* PC World *staff members Mike Desmond, Ulrike Diehlmann, John Goddard, Anita Hamilton, Caroline Jones, Owen Linderholm, Dan Miller, and Susan Silvius contributed to this article.*

For more information about all products in this article, circle reader service no. 902.

Buy IBM ValuePoint P60/D provides a considerably better value in a Pentium system. (At press time Acer dropped the price on this PC by about $400, making it a much more attractive value.)

Acma 486/66/DX2 System

VITAL STATISTICS

Direct price: $3495
Processor: Intel 486DX2-66
PROS: Good performance and expandability
CONS: Poor documentation
Contact: Acma Computers, 800/786-6888, 510/623-1212
Reader service no. 674

The decision to buy at the high end, where low cost isn't your primary consideration, means you can think big—and may have you looking at Acma's roomy 486/66/DX2 System, a full-size tower that's loaded with components and comes at a reasonable $3495 price. Like many of the PCs here, the Acma comes with a 486DX2-66 CPU and a 256K secondary cache. But this system sports a generous 16MB of RAM, a big 544MB Conner IDE hard drive, and a 4MB VESA local bus caching disk controller. This potent mix equips the Acma to run Windows NT without an upgrade, and the system would also make a hot OS/2 workstation. In our Windows test suite, the Acma outperformed our average DX2-66 by almost 20 percent. Granted, it couldn't keep pace with the Pentiums, but it ran neck and neck with the fastest 486s. And the video setup is about as good as you'll find: a Diamond Viper VLB local bus graphics accelerator (with a healthy 2MB of VRAM) paired with a flicker-fighting 15-inch Mag monitor.

Inside, system RAM is easy to reach and expandable to 32MB; just pop in four more 4MB 30-pin SIMMs. In addition, there are four free ISA slots, five free drive bays, and a 238-pin ZIF CPU socket. Unfortunately, the internal scenery is littered with wires and cables. Worse, removing or installing VL bus cards causes the motherboard to flex more than we'd like.

As usual, Acma service and support rates well. We had little problem getting through on Acma's toll-free lines, and the technical support staff was generally accurate. The company offers a 45-day money-back guarantee along with a year of free on-site service, but

the basic one-year warranty and weekday-only support can't match the policies of the top companies. Still, this is a fast system with a good price and plenty of expandability. If you need a big PC with a great video subsystem—and you don't want to pay an arm and a leg for it—the Acma 486/66/DX2 System merits consideration.

ALR Evolution V

VITAL STATISTICS

Direct price: $5088
Processor: Intel Pentium-60
PROS: Fast, fine service and support
CONS: High price
Contact: Advanced Logic Research, 800/444-4257, 714/581-6770
Reader service no. 675

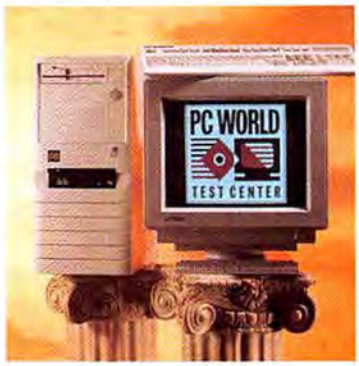
ALR's latest bundle of dynamite is proof that big power can lurk inside a small package. At the core of this compact desktop is the hot 60-MHz Pentium processor. Amply fleshed out with 16MB of RAM, a 256K secondary cache, and a Conner 544MB IDE hard drive, the Evolution V is a solid candidate for a Windows NT workstation and has more than enough zip for OS/2. Given its Pentium processor, we weren't terribly surprised to see the Evolution blaze through our test suite. In Windows tests, this system ran approximately 50 percent faster than the average DX2-66 system we've reviewed, and, helped by a hefty 4MB caching disk controller, it performed twice as fast as the average 66 on the Paradox test. Its BAPCo grades were equally impressive—70 percent faster than our average system. Now that's the kind of outstanding application performance we were expecting from the Pentium—and the brand of raw speed that's bound to inspire a case of Pentium envy in any user who tries out an Evolution V.

As you'd expect with an ALR design, the Evolution's interior is cleanly laid out, and the Pentium CPU has plenty of fan-cooled airspace. ALR even attaches a RAM-expansion guide to the inside of the PC's cover. Four of the Evolution V's six expansion slots are free, including one VESA local bus slot. Two other VESA slots are filled with the caching disk controller and an ATI Mach 32 graphics accelerator with 2MB of speedy VRAM. Two externally accessible 5¼-inch drive bays are free.

ALR service and support is strong and consistent; technicians responded promptly to toll-free calls (even on Saturday) and answered every one of our questions with near-perfect accuracy. The company offers a 15-month labor warranty and covers parts for an impressive five years as well. ALR also provides a year of free on-site service and a 30-day money-back guarantee.

Sure, we have a few beefs. First, with a PC priced around $5000, it would be nice to have a monitor larger than the 14-inch ALR FlexView. And while ALR's documentation is generally complete, much of it is a bit too terse for our taste. Still, with its formidable performance, memory, and storage, the Evolution has an awful lot going for it—especially as a server or an NT system—and we rate it as a very fine value.

Ares 486-66DX2 EISA/VESA



VITAL STATISTICS

Direct price: $3295
Processor: Intel 486DX2-66
PROS: Expandable, 60-day money-back guarantee
CONS: None
Contact: Ares Microdevelopment, 800/322-3200, 313/473-0808
Reader service no. 676

The Ares 486-66DX2 EISA/VESA is loaded for power and expandability. For $3295, you get 8MB of RAM, a 256K secondary cache, and a 340MB hard drive with a 2MB local bus caching controller. And there's plenty of room to grow: RAM capacity maxes out at a dizzying 256MB, the secondary cache expands to 512K, and even the caching controller can accept 16MB more. Finally, the DX2-66 processor rests in a 238-pin ZIF socket. This fast system's benchmark results surpassed those of the average 66-MHz 486DX2 by a healthy 12 percent. The large tower configuration provides four free drive bays and a free local bus slot. If you're looking for a server or an engineering workstation, you'll appreciate the four free EISA slots. The video subsystem isn't bad either: The combination of a Hercules Graphite VESA local bus graphics accelerator and a 15-inch CTX monitor should suffice for most business applications.

Ares seems confident you'll like its products: The company offers a singular 60-day money-back guarantee. You also get a generous two-year parts and lifetime labor warranty and 24-hour toll-free technical support. The technicians answered our test questions accurately—although response times varied more than we like. Considering the month-to-month fluctuation in even the best companies' responsiveness, however, we're reasonably satisfied. And looking at the big picture, it's impossible to ignore this unit's versatile expandability, which includes the capability to handle EISA cards. When you add the robust service and support into the mix, you come up with one of the best values here—a system that misses a Best Buy by a whisker.

AST Premmia 4/66d Model 343W

VITAL STATISTICS

Street price: $3967
Processor: Intel 486DX2-66
PROS: Upgrades to true Pentium, fast, 17-inch monitor
CONS: High price
Contact: AST Research, 800/876-4278, 714/727-4141
Reader service no. 677

If you're the type who wants steak at hamburger prices, the AST Premmia is not the system for you. If, on the other hand, you're

Do You Make These Six Common Mistakes On Your Taxes?

Award-Winning! EasyStep SYSTEM

Six common mistakes can cause you big headaches on your taxes. An oversight here, an omission there. From unnecessary tax payments to full blown IRS audits -- you can end up paying too much ... or worse.

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

1 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.

2 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.

3 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.

4 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.

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

6 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.

America's #1 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 award-winning EasyStep® tax preparation process, you can completely and accurately prepare your income taxes in just a few hours.

Here's how easy it is!

A. *Gather your records and receipts.*
B. *Enter your data into TurboTax.*
C. *Print out, sign and drop in the mail.*

TurboTax does the rest. Even if your records and receipts aren't in any particular order, TurboTax's new EasyStep system will guide you every step of the way. And like a good tax advisor, TurboTax helps you identify every deduction you can claim.

PC MAGAZINE EDITORS' CHOICE FEBRUARY 23, 1993 TURBOTAX FOR DOS

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 IRS-approved format right on your own printer -- ready to sign and mail (or file electronically, if you prefer, for a faster refund).

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 5 Point Guarantee:

1. **Guaranteed Easy to Use.**
2. **Guaranteed Accurate.**
3. **Guaranteed Complete.**
4. **Guaranteed Support.**
5. **Guaranteed Faster.**

PC Magazine says TurboTax "...is clearly the best of the 1992 tax programs." Try it for yourself.

Free Bonus-- Dinosaur Adventure!

The fun way for the whole family to learn the real story of the dinosaurs! Includes full color, sound and motion video, two games, and an encyclopedia. For ages 3 and up, **no CD ROM player required.** FREE with your order!

☐ Yes, I'll try TurboTax! Only $39.95** ChipSoft

Rush me TurboTax ASAP. I'll save $30.00 off list price! If I don't like it for any reason, I'll just send it back by April 15, 1994 and my payment will be refunded.

Please Choose:
☐ TurboTax (IBM®-compatible)
☐ TurboTax for Windows™
☐ MacInTax (for Macintosh®)
☐ 3-1/2" disks, or
☐ 5-1/4" disks

Name
Address
City State Zip
Bill My: ☐ Visa ☐ MasterCard ☐ Discover ☐ Amex
I understand that there is an additional $7.00 shipping per order.
Card # Exp. Date
Signature

YOUR SATISFACTION IS GUARANTEED
If you're not satisfied with TurboTax or MacInTax for any reason, just return it by April 15, 1994 for a full refund.
No Questions Asked.

Mail your order to: ChipSoft, 2650 E. Elvira Rd., #100
Or Call NOW: Tucson, AZ 85706

1-800-964-1040 ext. E318

TurboTax requires IBM PC, XT, AT, PS/1, PS/2 or compatible, DOS 3.0 or higher, 640K RAM, hard drive. TurboTax for Windows requires Windows 3.1 or higher, 2MB RAM, hard drive. MacInTax requires Macintosh Plus, System 4.2 or higher, hard drive. Offer expires 4/15/94 -- not valid with any other offer. ® TurboTax, MacInTax, and EasyStep are registered trademarks of ChipSoft, Inc. and ChipSoft CA, Corp. Other trademarks are the sole property of their respective owners. **AZ residents add 5%, CA residents add 7.25%, FL residents add 6% sales tax. Please add $7.00 shipping and handling per order. *For retail purchases attach a copy of sales receipt and enclose $7.00 U.S. for shipping and handling. (Check or money order payable to ChipSoft.) Send to: ChipSoft, Dinosaur Adventure Offer, 2650 E. Elvira Rd., #100, Tucson AZ 85775. All prices are U.S. dollars. PC Magazine Editors' Choice Logo ©1985 Ziff Davis Communications Company.

RUNNING WIND
NORTON DESKTOP
SWIM AFTER
AND THEN R
THE POOL WITH

Listen up, you risk-takers. What would your mother say if she saw you now?

No doubt she would tell you to get the new Norton Desktop 3.0 for Windows before you hurt yourself. Or your computer.

That's because NDW 3.0 not only enhances your work, it's also the safest way to run Windows short of tapping into Bill Gates' subconscious.

Made by Peter Norton, it's packed full of utilities to provide a safer working environment.

Like our new Norton AntiVirus 3.0, which protects your system against over 2,300 known viruses, and our new Norton BackUp™ 3.0 with enhanced support for SCSI drives. There's also the new UnErase, to recover accidentally erased files. Disk Doctor for automatic disk diagnosis and repair. And a Fix-It disk with a full collection of DOS utilities to recover and repair files or entire disks, even if you can't run Windows. And now

For information in Europe, call 31-71-353111. Australia, 61-2-879-6577. Canada, 1-800-667-8661. Elsewhere outside U.S., 408-252-3570. The Norton AntiVirus and Norton Disk

OWS WITHOUT
? YOU PROBABLY
A BIG MEAL
UN AROUND
SCISSORS, TOO.

for the first time you'll be able to run Speed Disk under Windows to boost performance.

In addition, NDW 3.0 simplifies Windows for you by integrating file and program management. And while the new FileAssist will allow you to easily manage your files without having to leave your applications, the new Day Planner will allow you to easily manage your life.

Plus, the new "push button" Control Center lets you customize pull-down menus, icons, toolbars and more to make Windows look and work the way you want it to.

So the choice is yours. Either see your local dealer, call 1-800-628-4777, ext. BG86 to order, or live a life of danger and recklessness, running Windows without Norton Desktop 3.0 for Windows and sprinting around pools with sharp objects until you put somebody's eye out.

Of course, you would be absolutely crazy not to get NDW 3.0. And remember, don't run Windows without it!

THE NORTON DESKTOP™ FOR WINDOWS

SYMANTEC.™

Doctor are registered trademarks and Norton BackUp, Norton Desktop and Speed Disk are trademarks of Symantec Corporation. ©1993 Symantec Corporation. All rights reserved.

willing to pay top dollar for top sirloin, you might want to give the Premmia a look. When it comes to performance, expandability, *and* price, this system is a premium cut.

If you're looking for speed, the AST Premmia 4/66d is one of the fastest systems here—17 percent faster overall than our average 66. It's particularly adept at graphics- and disk-intensive work—23 percent faster than average in the Freelance test and a whopping 44 percent faster in Paradox. AST uses a proprietary local bus for both the ATI Mach 32 graphics accelerator chip and the hard drive adapter. And the entire video subsystem—with its big 17-inch AST display—supports an eye-easing 76-Hz refresh rate up to 800 by 600 resolution.

If the Premmia's current performance isn't enough for you, ample upgrade options are available. The system features an EISA bus, the favored choice for engineering and design workstations as well as the de facto LAN server standard. All five EISA slots are free, as are two of the compact case's externally accessible drive bays. The Premmia's RAM and secondary cache are upgradable to 128MB and 512K, respectively, and a 238-pin ZIF CPU socket will let you upgrade the current DX2-66 to some form of future Intel OverDrive chip. But the Premmia has another upgrade option you won't find elsewhere: The socket for the system's secondary cache module is designed to take a CPU upgrade module containing a *true Pentium* CPU. AST says its Pentium module will be available during the first quarter of 1994; pricing's not yet available.

AST backs the Premmia with beefy service and support, including a three-year warranty, a year of free on-site service, and toll-free tech support 24 hours a day. Our main gripe: Getting through to a human respondent on the tech support voice-mail system can be a long, confusing process. Our only other complaint is the $3967 price, which is likely to be hard for budget buyers to swallow. If you've got the dough, however, the Premmia is a prime choice.

Blackship BLK 486/66LB

VITAL STATISTICS

Direct price: $1995
Processor: Intel 486DX2-66
PROS: Inexpensive
CONS: Relatively few tech support hours
Contact: Blackship, 800/531-7447, 408/432-7500
Reader service no. 678

In last month's system review, we noted that the line between high-value and high-power PCs is blurring. Blackship's BLK 486/66LB is clearly a case in point. This month's Blackship is a solid—if unremarkable—DX2-66. Its 8MB of RAM, 256K of secondary cache, 244MB Quantum hard drive, and 14-inch monitor are basics for a 66-MHz machine. But the system's $1995 price is a knockout—especially considering that the 486/66LB's performance matches that of our average 486DX2-66. The system scored higher on our Freelance and Paradox tests and lagged slightly on the BAPCo suite.

This minitower has generally decent expandability and includes a 238-pin ZIF socket, designed to let you upgrade to a future Intel OverDrive processor. Also, five of the seven expansion slots are free. All the free slots are 16-bit ISA; the two VESA local bus slots are filled with the video and hard drive adapter. Unfortunately, because of the placement of the CPU with its fan-cooled heat sink, only one free slot accommodates a full-length card. Of course, because of increasing component miniaturization, card lengths are generally smaller than in the past. RAM is very accessible and expands to 64MB, but you have to remove at least four of the eight 1MB SIMMs to go beyond the standard 8MB. And you can expand the secondary cache to an impressive 1MB. The documentation covers every aspect of the PC and is adequate if not fancy.

Blackship's solid service and support includes a one-year warranty backed by free on-site service, a 30-day money-back guarantee, and five-day-a-week toll-free tech support. Although the company's daily tech support hours are run-of-the-mill, all our calls were answered right away. Uncharacteristically for Blackship, the technicians missed our toughest question this time.

If you're looking for the ultimate high-power PC, the BLK 486/66LB won't knock your socks off. But Blackship does deliver a lot of machine for the money.

Comtrade EISA VL-Bus Professional 66

VITAL STATISTICS

Direct price: $3295
Processor: Intel 486DX2-66
PROS: Three-year warranty, 544MB SCSI hard disk
CONS: Cluttered interior
Contact: Comtrade, 800/969-2123, 818/961-6688
Reader service no. 679

At first glance, the $3295 Comtrade seems a bit pricey for a compact 66. But a closer look reveals a Best Buy system loaded with powerful potential. In fact, this machine would do a competent job as a server for a small-office LAN or—with its 15-inch monitor—as an engineering or design workstation. Not that its extra capabilities should keep it off your desktop.

Like many of the PCs here, this system uses an Intel 486DX2-66 CPU. Unlike most, however, the Comtrade combines two 32-bit buses and a 16-bit ISA bus, so its motherboard offers great versatility. Two VESA local bus slots (one free), three EISA slots (two free), and three 16-bit ISA slots (two free) permit an expedient mix of peripherals—such as the fast Diamond Viper VLB local bus graphics accelerator with 2MB of VRAM, the 4MB EISA SCSI caching hard disk controller, and an 8-bit card (installed in a 16-bit slot) to handle the I/O ports.

The Comtrade has 8MB of RAM, a 256K secondary cache, and a big 544MB Conner SCSI hard disk. Performance overall is average, but the EISA caching drive controller contributed to an outstanding result in our Paradox test—36 percent faster than our average DX2-66. That's good news if your main application is very disk intensive.

The downside of stuffing the amenities of a server into a compact case is compromised accessibility. Upgrading SIMMs in the cluttered interior is a challenge, as the I/O card and power supply are in the way. And in the 8MB configuration, all the 30-pin SIMM sockets must be filled with 1MB SIMMs. We suggest ordering the PC with 16MB of RAM, which not only gives you more RAM but also leaves four sockets open for further upgrades (128MB is the limit). Two externally accessible drive bays are free. The SCSI drive controller's external port adds a host of SCSI peripherals to your expandability options.

Strong service and support includes a three-year warranty, a year of free on-site service, and responsive, toll-free tech support 12 hours a day, six days a week. If you can tolerate a rough edge or two and you order this Best Buy PC with the correct RAM configuration, you'll wind up with a versatile, value-packed workhorse.

Dell Dimension 466V/XPS

VITAL STATISTICS

Direct price: $3318
Processor: Intel 486DX2-66
PROS: Excellent performance and design
CONS: Longish waits for tech support
Contact: Dell Computer Corp., 800/289-3355, 512/338-4400
Reader service no. 680

The Dimension 466V/XPS is the most muscular member of Dell's inexpensive value line. But despite a $3318 price that seems low for a Dell, the company has cut precious few corners. In fact, this system has refinement written all over it, with outstanding design extras that make it an easy Best Buy.

For starters, components such as RAM, secondary cache, and add-in boards are kept clear and easy to reach. For the ultimate in an easy RAM upgrade, Dell installs 16MB of RAM in a single SIMM module, leaving three SIMM sockets open to accept upgrades all the way to the maximum 64MB. And the Dimension has plenty of expandability: five free 16-bit ISA slots, one free VL slot, and three free drive bays, two of them externally accessible.

The Dell powered through our application test suite, posting scores almost 12 percent better than our average 486DX2-66 and just 9 percent behind NEC's overall 486 winner. Of course, the Dimension 466V/XPS's performance wasn't hurt by the fast Diamond Viper VLB graphics accelerator with 2MB of VRAM. With its healthy complement of RAM, 256K secondary cache, and 340MB Western Digital Caviar hard disk, this PC is a credible applicant for a job handling OS/2 or Windows NT. And Dell even throws in a 15-inch monitor.

When it comes to service and support, few companies surpass Dell's reputation. The package includes 24-hour toll-free support and a one-year warranty backed by free on-site service. What diminished Dell's score this time was the 5 to 10 minutes we had to wait on hold before we reached a support technician. But as always, Dell provided impeccable courtesy and dead-accurate answers. And the system documentation is terrific, with clear, detailed instructions. All in all, the Dell Dimension 466V/XPS presents a tremendous package. It's not the fastest 486 here, but it features top design, quality construction, and a reasonable price—and it's backed by one of the most respected names in the business. All that adds up to a slam-dunk Best Buy for Dell.

Diamond DT 486DX2-66 VL-SCSI

VITAL STATISTICS

Direct price: $2799
Processor: Intel 486DX2-66
PROS: Low price, SCSI hard drive, removable IDE hard drive
CONS: Inefficient design
Contact: Diamond Technologies, 800/989-7253, 714/533-9910
Reader service no. 681

The Diamond DT's $2799 price ties for fifth lowest here—but this PC is not just inexpensive. It's loaded with mass storage capabilities, including a 320MB SCSI hard drive and an additional 80MB removable IDE hard drive. The removable drive lets you secure sensitive data off site or transport applications and data between systems equipped with drive receptacles. The standard 8MB of RAM can go as high as 128MB, and you can expand the 256K secondary cache to 512K. In addition, the system accepts a wide range of peripherals. You get five 16-bit ISA slots (three free), two VESA local bus slots, and even a free EISA slot. Additional peripherals, such as magneto-optical and CD ROM drives and scanners, can be daisy-chained off the external port on the local bus SCSI-2 host adapter.

Performance on this 486DX2-66, however, dips below average. And the system doesn't show much polish. The 8MB of system RAM sit beneath an unrestrained jumble of cables and fill all eight SIMM sockets, so you have to discard existing SIMMs when you want to upgrade. Diamond installed some of the I/O ports in a slot backplate connected to the main I/O card with cables—a common practice. If you need to use such an obstructed slot, you can usually reinstall the ports in dedicated case cutouts. But with Diamond's setup, you can't move the ports without buying longer cables. It would be a whole lot easier for the system buyer if Diamond had just included longer cables with the PC. And the Diamond DT's graphics subsystem is just so-so. The Western Digital Paradise graphics accelerator with 1MB of DRAM is adequate, but Diamond supplies a fairly low-grade 14-inch CTX monitor.

Diamond service and support rates high, with a competitive 15-month parts warranty (24 months on labor) and toll-free phone support. Diamond never forced us to wait for a technician, and every question was answered with impeccable accuracy and courtesy. On balance, this PC—with its nifty removable hard drive and SCSI adapter—provides a whole lot of value. But Diamond cut some corners to give you the low price. So if the DT 486DX2-66 VL-SCSI turns you on, make sure a flicker-free video subsystem isn't a high priority—or purchase a better video option.

Gateway 2000 4DX2-66V

VITAL STATISTICS

Direct price: $2995
Processor: Intel 486DX2-66
PROS: Fast, excellent expandability, CD ROM drive
CONS: So-so service and support
Contact: Gateway 2000, 800/846-2000
Reader service no. 682

For several months last year we had a hard time recommending Gateway systems. The company's tech support staff, caught temporarily shorthanded by fantastic sales, could not answer calls in a timely manner, and sometimes we were unable to complete our support inquiries for a review. When we called for this month's review, however, we consistently got through in 8 minutes or less; that may seem like a relatively long wait, but it's a huge improvement. Considering the balance of good price, fast performance, and full features that Gateway 2000 routinely provides, it's great to see the service picture brightening.

The resurrection of Gateway's phone support helps make this $2995 local bus speedster a Best Buy. We've reviewed it before, and it's still one of the fastest Windows machines on the market. Spurred along by local bus drive and graphics adapters, it's 23 percent faster in our Windows suite than our average 486DX2-66.

We're also impressed with this full-size desktop's expandability: It comes with a 238-pin ZIF CPU socket, a roomy 424MB hard drive, and a hefty 16MB of RAM. You can upgrade RAM to 64MB, although all four SIMM sockets are already filled, so you'll have to discard one or more 4MB SIMMs, depending on the size of your upgrade. But with the double-speed CD ROM drive installed, two 5¼-inch drive bays still remain free for a second floppy and a tape drive. One of the two VLB slots is occupied, but all five of the ISA slots are available. That should be plenty for almost any application.

We've reviewed this $2995 local bus speedster before, and it's still one of the fastest Windows machines on the market.

Gateway 2000 technical support hasn't completely regained its former preeminence; the competition is now stiffer. The one-year warranty doesn't match the two- and three-year policies now available from some vendors. Gateway's tech support lines are open 18 hours on weekdays, 5 hours on Saturday, and never on Sundays. That's still very good—just not the best. But the difference between Gateway's solid support and the state of the art doesn't keep droves of buyers from snapping up Gateway systems. Why? Because products like the Best Buy 4DX2-66V are such super combinations of performance and features—delivered at an attractive price—that they're always among the best values available.

IBM PC Company ValuePoint P60/D

VITAL STATISTICS

Direct price: $4999
Processor: Intel Pentium-60
PROS: Excellent performance and documentation
CONS: Expensive
Contact: IBM PC Company, 800/426-2968

The folks at IBM PC Company make quite a statement with the $4999 ValuePoint P60/D. Packed with the latest features and next-generation technology, this Pentium-based powerhouse straddles the line between high-end workstations and typical business PCs—and does such an outstanding job, it earns a Best Buy in the process. If you're running OS/2 or Windows NT, or if you just want one of the fastest PCs around, the ValuePoint P60/D has you covered.

The ValuePoint P60/D features the first PCI expansion bus we've seen on a production system. On this machine, the PCI bus uses a 32-bit data path and a 30-MHz clock to speed data I/O. The PCI bus and hot processor helped the ValuePoint P60/D slash through our tests almost 35 percent faster than our average 486DX2-66. Those results place the ValuePoint a very close second to the front-running Pentium ALR Evolution V. It's worth noting that the integrated PCI-bus ATI graphics accelerator boosts Windows performance, but the system couldn't quite match the leaders' caching hard disk controllers on the most highly disk-intensive tests (Paradox being the best example).

You get a power user's configuration when you buy this PC: 16MB of RAM expandable to 128MB, a 256K secondary cache, and a 424MB IDE hard disk (a just-released 527MB Maxtor MXT/527 IDE drive is available instead for $480 more). Two of the four SIMM sockets are filled by 8MB SIMMs, so you have room to add more RAM if you need it. With a PC this powerful, you may—especially if you plan to take advantage of expected Windows NT applications. The included monitor has all the right stuff: A 15-inch display provides a flicker-free 76-Hz refresh rate even at the top 1280 by 1024 resolution. And there's room to grow inside this compact. Three free ISA slots and two free PCI slots are mounted on a vertical card. You can install either two ISA and two PCI cards or one PCI and three ISA cards. And you get three free drive bays (two externally accessible).

IBM PC Company continues IBM's long-standing tradition of great documentation, and the warranty and service package is solid industry standard, including one year of free on-site service. But our calls to the 24-hour toll-free technical support line left us scratching our heads this time. Responsiveness was superb, but accuracy fell short of our expectations for IBM. Overall, however, the IBM ValuePoint P60/D is an impressive combination of Pentium CPU and PCI bus—the perfect juxtaposition of two new technologies. If you're looking for Pentium power at the price of some high-end DX2-66s, this Best Buy is too good to miss.

Insight 486DX2-66 Smart Server

VITAL STATISTICS

Direct price: $2799
Processor: Intel 486DX2-66
PROS: High-resolution video, good price
CONS: Inflexible RAM upgrades
Contact: Insight, 800/927-7848
Reader service no. 683

Users are to be pardoned if they're confused by this big Insight PC. While its name and expandable tower configuration spell server, the VESA local bus graphics accelerator with 1MB of DRAM and 17-inch Mag monitor speak more to the graphics power user. And the 486DX2-66 Smart Server *would* make either a fine server for a midsize LAN or a knockout CAD/CAM workstation. But when you get right down to it, the wide screen would be welcome in any business application. Who among us wouldn't like to be able to see the bigger picture? And a 17-inch monitor opens up the world of higher resolution—the 1024 by 768 mode that would have you reaching for a magnifier on a 14-inch monitor is quite usable for most people on the 17.

The Insight's name and its expandable tower spell server, but the 17-inch monitor speaks more to the graphics power user.

The Smart Server does not lag when it comes to performance, either: It matches or exceeds our average 66-MHz system in every application benchmark. The motherboard is well laid out, with SIMM sockets and the ZIF CPU socket fully accessible no matter how many expansion cards you install. And if you need more drive space than the four free drive bays provide, there's space and tapped rails to install another drive cage that can hold up to three additional 3½-inch drives. The part in question is a standard accessory that should be available at any sizable computer supply house. But if you buy the 8MB RAM configuration, upgrading will be expensive, as all eight 30-pin RAM sockets are full, and you must discard at least four 1MB SIMMS to add higher-capacity units. We suggest buying your system with 16MB installed. Then you'll have the four free sockets you need to expand RAM to the maximum 32MB.

Insight's basic service and support includes 24-hour toll-free technical support. We had to wait 15 minutes on hold during one call, but fortunately we ultimately got the answer we were looking for. Insight doesn't offer an on-site service option, although the company promises a three-day repair turnaround. This package matches good performance with high-end video—a balance you don't ordinarily find in a server. That—along with its outstanding $2799 price—may be enough to make you consider placing this big system at your deskside.

National MicroComputers Universal Pro-System 466

VITAL STATISTICS

Direct price: $3404
Processor: Intel 486DX2-66
PROS: Good performance, one-day repair turnaround
CONS: Slightly cluttered interior
Contact: National MicroComputers, 800/424-2983
Reader service no. 684

National MicroComputers' Universal Pro-System 466 is a nimble DX2-66 with 16MB of RAM, a 256K secondary cache, and a 4MB local bus caching disk controller. It outpaced the average DX2-66 by 17 percent overall. Storage is well handled by a nifty combo floppy drive and a 340MB hard disk.

National Micro's service stacks up well, too. The company offers fast, one-day turnarounds on factory repairs and a two-year labor and one-year parts warranty. On-site service is just $39 for the first year, and we got perfect tech support answers with an average of just 2 toll-free minutes on hold. You can't call on weekends, however.

Inside this full-size desktop case, the DX2-66 CPU rests in a 238-pin ZIF socket. We do wish National Micro had paid closer attention to tidying up the cables inside. But the 16MB RAM configuration leaves four 30-pin sockets free. You can expand all the way to 64MB if you have the inclination (and the bucks). You also get three drive bays (two external) and five 16-bit slots free.

This PC isn't a cheap model. Its $3404 price is middle-of-the-road for this review and above average for 486DX2-66s we've reviewed recently. But its copious system RAM and generous 4MB caching controller are above average too. Add in terrific service and support and fine performance, and you have a powerful system that's well worth considering.

NCR System 3333

VITAL STATISTICS

Direct price: $3695
Processor: Intel 486DX2-66
PROS: Excellent service and support, good expandability
CONS: Relatively high price
Contact: NCR Corp., 800/327-2600, 513/445-5000
Reader service no. 685

At last NCR welcomes the masses! Long focused on volume sales to Fortune 1000 companies, NCR now sells directly to end users. You get the same excellent service and support, quality design, and solid performance once reserved for

Call Your Catalog SuperStore Today 1-800-252-0286

The PC Zone™ Your Catalog SuperStore

Lower than warehouse and superstore prices!

Last Minute Gifts the Easy Way!

$6 Overnight Shipping via Airborne Express

Logitech MouseMan Serial

$53.98

The MouseMan Serial is specifically tailored for right or left-handers. Easily program MouseMan's three buttons for the Windows commands and hot keys you use the most. MouseMan offers 400 dpi default resolution and increased speed, is guaranteed to be compatible with all your applications, and comes with MouseWare Utilities, including ballistic drivers, and control panels for DOS. Logitech *#09085*

WinSound 16 CD-ROM Kit

$489.98

- State-of-the-art multimedia upgrade kit
- Level 2 CD-ROM drive compatibility

Put animation, higher color quality and full screen action on your PC. Kit comes with four CD-ROM titles and a professional joystick for immediate action game enjoyment. Sigma *W #13409*

Sony 3.5" 128MB Rewritable Optical Disk

$48.98

Built to withstand up to 10 million erasures, this disk has the highest data integrity for high activity applications. Sony *#06404*

Casio Z-7000 Personal Digital Assistant

$629.98

The Z-7000 can store your handwritten notes and sketches. Keep track of calendars, phone numbers, addresses, and personal finances, give you easy access to electronic mail and a variety of online services. FREE Leather Carry Case Casio *#98049*

Don't wait! Power-up for an amazing low price!

Lotus 1·2·3 RELEASE 4 for Windows Competitive Upgrade

$98.98

Get the power of Lotus 1-2-3's latest – RELEASE 4 – at a very affordable price! Why not take advantage of this opportunity to use the spreadsheet program that has become the favorite of millions, first in DOS and now in Windows. With many new features you'll only find in 1-2-3, Release 4 will give your work the kind of boost that makes a big difference in your productivity. Proof of purchase of competitive product required. Lotus *W #12397*

W #12395 **Lotus 1·2·3 RELEASE 4 for Windows Upgrade (Full Version) $320.00**

W #12405 Special Bundle Offer

- **Lotus 1·2·3 RELEASE 4 for Windows Upgrade**
- **Microsoft Windows 3.1**
- **Logitech MOUSEMAN™ Mouse $159.98**

We have more than 2,500 different products in stock.

TOP 50 SOFTWARE PRODUCTS

W 10923	Act! for Win 1.1 - D	$248.98
W 11903	Adobe Photoshop 2.5 for Win - D	$548.98
W 07787	After Dark 2.0 for Windows - D	$28.98
W 12562	Aldus PageMaker 5.0 Upgrade - 3"	$139.98
W 7737	Aldus Persuasion 2.1 - 3"	$318.98
B 7328	Borland C++ 4.0 - 3"	$336.98
W 12556	CorelDraw 3 - 3"	$134.98
D 09996	Design Your Own Home Architecture - D	$32.98
W 11328	FileMaker Pro 2.0 for Windows Upgrade - D	$122.95
W 07475	Fractal Painter 2.0 for Windows - 3"	$258.98
W 11188	FrameMaker 4.0 for Windows - 3"	$579.98
W 07431	FreeLance 2.0 Competitive Upgrade - 3"	$98.98
W 09668	Lotus 1-2-3 for Windows 1.1 - 3"	$308.98
D 7151	Lotus 1-2-3 3.4A Upgrade - 3"	$98.98
W 12397	Lotus 1-2-3 4 for Windows Upgrade - 3"	$98.98
W 09723	Lotus Ami Pro 3.0 Competitive Upgrade - D	$94.98
W 12015	Lotus Improv for Windows - 3"	$89.98
W 11193	Lotus Organizer for Windows - D	$98.98
W 07497	MS Bookshelf for Windows '93 Edition - C	$128.98
D 12228	MS DOS 6.0 - 3"	$48.98
W 11978	MS Encarta - C	$248.98
W 07893	MS Excel 4.0 Competitive/Version Upgr - 3"	$98.98
W 11886	MS FoxPro 2.5 Windows Comp Upgrade - 3"	$128.98
W 12153	MS Office 3.0 Competitive/Version Upgr - 3"	$128.98
W 07209	MS PowerPoint 3.0 for Win Comp Upgr - 3"	$118.98
W 12147	MS Printing System for Windows - D	$128.98
W 12027	MS Profit - 3"	$128.98
W 07610	MS Project 3.0 for Windows - D	$448.98
W 09760	MS Publisher for Windows - D	$128.98
W 11878	MS Visual Basic Pro 2.0 Comp Upgrade - 3"	$198.98
W 07752	MS Windows 3.1 - 3"	$89.98
W 07404	MS Word 2.0 for Windows Comp Upgr - 3"	$118.98
W 09763	MS Works 2.0 for Windows - D	$128.98
W 07834	Norton Desktop 3.0 for Windows - 3"	$114.98
B 07382	Norton Utilities 7.0 - 3"	$114.98
W 11872	Paradox for Windows 4.5 - D	$138.98
W 11740	Pixar Typestry for Windows 1.1	$184.98
W 11145	Procomm Plus for Windows - D	$94.98
B 09709	QEMM 386 - 3"	$59.98
W 11910	QuarkXPress 3.3 for Windows - 3"	$579.98
W 11257	Quattro Pro for Windows - 3"	$42.98
W 09768	Quicken 2.0 for Windows - D	$39.98
B 09851	Stacker 3.1 - D	$98.98
W 12036	The Printshop Deluxe for Windows - 3"	$48.98
W 11509	Visio 2.0 for Windows - D	$123.98
W 09577	WinFax Pro 3.0 - D	$78.98
W 07011	WordPerfect for Windows Comp Upgrade - 3"	$118.98
W 07012	WordPerfect Version Upgrade 5.2 - 3"	$98.98

THE BEST OF THE REST...

W 09311	ABC Flowcharter for Windows 2.0 - 3"	$328.98
W 07918	AceFile 2.0 for Windows - 3"	$49.98
W 13021	Adobe Acrobat Starter Kit	$658.98
W 13013	Adobe Premiere for Windows	$189.98
W 11235	Adobe Type Set Value Pack - 3"	$38.98
W 07849	AutoSketch for Windows - D	$174.98
W 11919	Calendar Creator Plus 1.0 for Windows - 3"	$42.98
W 07731	Carbon Copy 2.0 - D	$109.98
D 12138	ClarisWorks - 3"	$94.98
W 13000	CompuServe Memb. Kit for Windows - 3"	$24.98
W 12556	CorelDraw 4	$388.98
W 13015	Digital Morph	$98.98
W 12508	Dynodex	$39.98
W 11907	Effects Specialist for Windows - 3"	$108.98
D 12184	ElFish - 3"	$36.98
W 11906	Fractal Design Sketcher	$52.98
B 11902	Images w/Impact! CD-ROM - C	$278.98
W 13001	infiniType Plus - 3"	$54.98
W 11335	ManagePro 2.0 for Windows - 3"	$238.98
W 12859	Morph 1.0 for Windows - 3"	$98.98
W 07750	MS Windows 2.1X, 3.0 to 3.1 - 3"	$48.98
D 11967	myHouse - D	$42.98
W 07868	New Math Blaster Plus - D	$38.98
B 07153	Norton AntiVirus 3.0	$84.98
W 12551	pcAnywhere 1.0 for Windows - 3"	$128.98
W 11078	Peachtree Acctg for Windows 2.0 - D	$114.98
D 07980	Presentation Task Force - D	$93.98
W 13007	Publisher's Paradise - C	$28.98
W 11849	SuperOffice Lite for Windows - D	$29.98
W 10530	WayForward Fun Pack - D	$28.98
D 11128	WordPerfect Works Competitive Upgrade - D	$74.98
W 11417	Winway Resume 2.0	$38.98

DON'T MISS IT!

Every issue of the PC Zone features:

- Over 2,400 of the latest software & hardware products for your PC
- Exciting contents and offers!

FREE PC ZONE 1 YEAR CATALOG SUBSCRIPTION PW001

Name _____

Address _____ Apt _____

City _____ State _____ Zip _____

Mail to: The PC Zone, 17411 N.E. Union Hill Road, Suite 140, Redmond, WA 98052-6716 Expect your first issue in 4-6 weeks

PLEASE USE THIS CODE TO RECEIVE THESE SPECIAL PRICES: PW001

To Contact Our International Offices Call:

- **FRANCE** Voice: ..... 33 14613 4740 Fax: 33 14790 6903
- **GERMANY** Voice: ..... 49 4055160 66 Fax: 49 4055121 51

WIN! An NEC Versa Notebook!

See below for eligibility and rules

The PC Zone™ Your Catalog SuperStore

Game Maker

$48.98

GREAT BUY!

- **Design your own games**

Design animated characters, monsters, sounds and import graphic images. Multi-level games have full screen scrolling scenes, track inventory, score and money. Game Maker includes three modifiable games with monsters, characters, and backgrounds.
Recreation Software ***D #11609***

Arts & Letters Air POWER

NEW

$34.98

- **Combines Drawing, Clip Art and Multimedia**

Create dramatic scenes using Warbirds of all nations from WWI to Desert Storm. Includes powerful drawing tools, typefaces, hundreds of clip-art images, sights and sounds. Print or export in EPS, WPG, WMF, CGM. No CD-ROM required.
Computer Support Corporation ***W #14401***

IBM Basic 101 Keyboard

$51.98

- **Full-function keyboard**
- **Space-saving design**

Careful construction ensures that this keyboard will provide long-lasting performance. With the familiar QWERTY key pattern, audible 'clicks' when you press the keys, and the right amount of resistance for fast, accurate input, this durable keyboard is a popular choice.
Easy Options by IBM ***B #13501***

B #13502 **Professional Keyboard $85.98**
B #13503 **Professional 101 Keyboard w/ Trackball .. $125.98**

TurboTax 1040 Headstart '93

$34.98*

- **Guarantee your taxes are done right!**

Do your taxes with your PC and TurboTax. Includes the Easy-Step system which leads you through your tax return. Includes card for FREE final version. Chipsoft ***W #11516***

***After $5 Mfg. Mail-In-Rebate**

Adobe WildType

$38.98

Fourteen irresistible fonts add playful creativity to any design. Use them as type or decorative dingbats – or perhaps a far-out monogram? Available for Windows and OS/2, they work with all PostScript, QuickDraw, LaserJet, dot matrix and inkjet printers. Adobe ***W #13023***

ELIGIBILITY AND OFFICIAL RULES

TO BE ELIGIBLE, you must enter by 1-31-94
TO ENTER: when you place your order, you are automatically entered in our contest. You may also enter by calling our toll-free ordering number at 1-800-252-0286, or by mailing us a standard 3x5 card or postcard with the following information:

- Your full name
- The code from the bottom corner of this page
- The name of your company
- Your work address and phone number

OFFICIAL RULES: You must be at least 21 to enter. Offer valid in the US only.
Winner is responsible for applicable taxes. No substitution will be made for any prize. Prizes may not be transferred nor will cash substitutes be offered. This offer is not open to employees of Multiple Zones, NEC or any other person or organization responsible for this promotion. Entries are invalid without 5 - digit code. Late, lost, illegible, misdirected or incomplete entries are ineligible. Odds of winning depend on the number of entries received. One prize will be awarded. Winner must execute an affidavit of eligibility and release or prize will be forfeited. Offer void where prohibited by law.

$6 overnight Shipping via Airborne Express

Don't see the product you're looking for? Just call...

TOP 50 HARDWARE PRODUCTS

B 05689	ACS300 Computer Speaker System w/Sub Woofer	$289.98
B 12951	Advanced Gravis Analog Pro	$41.98
B 09916	Bernoulli 90MB Cartridge 3 Pack	$438.98
B 05068	Canon BJ-10e Ink Refill Blk 2pk	$14.98
B 09734	Canon BJ-10EX Bubble Jet Printer	$258.98
B 09823	Colorado Jumbo 250 TBV	$189.98
B 11955	Fuji 3.5" HD IBM Formatted 11 Pack	$11.95
B 11953	Fuji 5.25" HD IBM Formatted 11 Pack	$7.95
D13156	Fusion Double CD 16	$538.98
B 12182	Hayes ACCURA 96 + FAX96 Ext	$217.98
B 12116	Hercules Computer Graphite HG210	$298.98
W 12629	Hercules Dynamite VL D501	$174.98
B 09522	Kensington Expert Mouse 4.0	$98.98
B 06421	Kensington Micro Saver System	$41.98
B 04690	Kensington NoteBook Traveler Deluxe Case	$78.98
B 06512	Kensington NoteBook Traveler Executive	$112.98
B 10662	Maxtor MXT 7213A 213.0mb IDE Int HD 15MS	$408.98
D 08620	Microsoft Serial Mouse and PS/2	$86.98
W 11931	Microtek ScanMaker II	$878.98
W 11930	Microtek ScanMaker II XE	$1,098.00
W 07866	Multisound	$518.98
D 11530	NEC CD Express PC w/CDR 25	$349.98
B 06722	NEC Multispin CDR 74-1	$636.98
B 99801	NEC Multisync 15 Monitor 3FGe	$629.98
B 07399	NEC Multisync 17 Monitor 5FG	$1,398.00
B 99990	NEC Multisync 17 Monitor 5FGe	$1,188.00
B 06701	NEC SilentWriter M95F	$948.98
B 05521	Pantone Process Color Imaging Guide 1000	$64.98
B 04056	Pantone Process Color System Guide	$57.98
B 06280	PowerPoint: Laser Light Pointer	$98.98
D 12180	Presenter Plus 1.2 w/ Compel	$348.98
B 10568	Pro Audio Spectrum 16	$158.98
B 11129	Remote Power On/Off	$118.98
B 07874	Seagate Int. 107MB HD	$299.98
B 08228	SIMMS 1MBx9 - 80ns	$49.98
B 06404	Sony 3.5 Rewrite M.O 512 Byte/Sec 128 MB	$48.98
B 12129	Sound Blaster 16 ASP	$228.98
B 05123	SuperMatch 17 Multimode Color	$999.98
B 00414	Supra Fax Modem V.32BIS w/o SW and Cable	$212.98
B 02183	SyQuest 44MB Cartridge Unformatted	$64.98
B 00183	SyQuest 88MB Cartridge	$106.98
B 06363	Targus Business Traveler - Standard Version	$198.98
B 06610	Targus Leather PowerBook Case	$99.98
B 06023	Targus Notepac Case Black	$35.98
B 06859	Texas Instruments microWriter PS23	$728.98
W 06499	Timbuktu/Win PhoneNET Kit	$275.98
B 12035	Trakker 250	$369.98
W 10514	Ultima Home Ofc 14.4Kbs data/14.4Kbs FAX w/voice	$189.98
B 10728	Video Blaster Bundle	$344.98
W 11825	Video Spigot for Win	$428.98

THE BEST OF THE REST...

B 09064	Advanced Gravis Joystick - Black	$36.98
B 05701	Bernoulli Transportable 90 Pro Ext	$678.98
B12532	Canon BJ 200	$368.98
W 12188	ColorUp - Pantone for Windows	$59.98
B 11240	Creative Labs Multimedia Upgrade Kit Int	$564.98
W 13516	Fotoman Plus	$527.98
B 12181	Hayes ACCURA 24 Ext	$73.98
D 11666	Hayes OPTIMA 144 +FAX144	$411.98
W 12622	Hercules Graphite HG 510	$294.98
W 12623	Hercules Graphite HG 720	$418.98
B 07216	Logi Kidz Mouse	$39.98
W 14008	Logitech ScanMan Easy	$239.98
B 06723	NEC Multispin CDR-38	$482.98
B 99800	NEC Multisync 15 4FGe	$749.98
B 05521	Pantone Color Imaging Guide 1000	$64.98
B 03691	PLI CD-ROM HD	$579.98
B 03339	Power Tree 10	$17.98
B 03343	Power Tree 50	$45.98
B 10511	Practical PM 1400 FX144/144 S/R Fax Int	$206.98
B 12380	Practical PM 9600 FX 96/96 S/R Fax Int	$189.98
B 12351	Practical PM 2400F Pocket 24/96/48 S/R Fax Ext	$119.98
B 11960	Quantum 240MB Hard Card Easy	$549.98
B 04491	Shiva NetModem E Thin/BNC	$1,478.00
B 12530	Sound Blaster Deluxe	$99.98
B 12531	Sound Blaster Pro Deluxe	$139.98
B 98850	SuperMatch 20 T Multimode Trinitron Clr Dsply	$2,898.00
B 11986	SyDOS Puma 88	$499.98
B 05284	Targus Premier Leather Note	$138.98
B 07454	Targus Universal Notebook Case	$68.98
B 08915	TEAC 1.4MB 3.5"" Floppy Drive	$59.98
W 11827	Thunder 24 Eisa	$1,789.00
W 14026	Wacom ArtZ Serial Graphics Tablet	$379.98

The Best Service Policies in the Industry

- All major credit cards accepted. No surcharge.
- Credit card not charged until order is shipped. If we must ship a partial order, freight is not charged on back order (USA only).
- Most personal and company checks received by mail clear immediately. All checks or purchase orders must have a phone number and contact person listed. A $20.00 fee will be charged on all returned checks.
- C.O.D. orders accepted: limit $1,000 per order. Cashier's check or money order only. Add $5.00 per C.O.D. order.
- Educational, government and corporate purchase orders accepted.
- All U.S. shipments insured at no extra charge. All products covered by 120 day limited warranty.
- Add applicable sales tax, only in WA, OH.
- Prices and product availability subject to change without notice. All specials and promotions limited to stock on hand. Call for current prices.
- All shipments refer to "in stock" items, barring system failure, etc.
- Shipping: $6.[illegible] per order in the USA for overnight Airborne Express up to 7 lbs. plus $1.[illegible] for each additional pound. (Some rural areas require an extra day for delivery). Canadian customer orders, in most cases, delivered within 24 hours.

Call for complete information.

- **Orders placed by 2am ET weekdays ship that day.**
- **Orders placed Saturday ship to arrive Monday.**
- APO/FPO box orders shipped first class U.S. Mail. Shipments to P.O. Boxes via UPS.
- Competitive and version upgrades require proof of purchase of qualifying software.
- Not responsible for typographical errors.
- **Defective software replaced immediately. Hardware repaired or replaced at our discretion.**
- **Return Authorization Number must be obtained prior to returning any item.**
- **We reserve the right to limit quantities.**

Call Customer Service Hotline: 1-800-248-9948 weekdays 6am to 6pm PT.
The PC Zone • 17411 NE Union Hill Road, Redmond, WA 98052-6716
International: 205-883-3088 FAX: 206-881-3421
International FAX: 206-883-6940

©1993 Copyright Multiple Zones International, Inc. All rights reserved.

KEY

W = Windows D = DOS
B = Both Windows & DOS
-3" = 3.5" Disk -5" = 5.25" Disk
-D = Dual (Both 3.5" & 5.25" Included)
-C = Compact Disk

Circle 168 on reader service card

PLEASE USE THIS CODE TO RECEIVE THESE SPECIAL PRICES: PW001

corporate buyers, and the service-and-support package is outstanding. You get a fantastic three-year warranty (with three years' free on-site service), toll-free 24-hour tech support, one-day factory repairs, and a 30-day money-back guarantee. NCR's tech support is knowledgeable and prompt, and detailed, coherent manuals will answer most of your questions. Performance is up to snuff: 5 to 10 percent faster overall than our average 66, with the PC doing its best work on our Freelance test.

When you open the 3333, you see what differentiates it from the nameless clones: plenty of room for expansion, and a DX2-66 CPU installed in a 238-pin ZIF socket. The 8MB of RAM fill only two of the four 72-pin SIMM sockets, making memory upgrades a snap—especially since you can mix and match different capacities of SIMMs. The secondary cache (64K is standard) comes on a plug-in module. So if you want a 256K secondary cache, order it with your system. The upgrade is easy, but you will have to discard the original 64K module.

The minitower case can also masquerade as a compact desktop unit. One of the six expansion slots is filled with a fast Diamond Viper local bus graphics accelerator, leaving a second local bus slot and four 16-bit slots available. And four free drive bays (two externally accessible) should cover typical desktop needs. A 340MB hard drive is just right for today's Windows user.

What's the downside? Price. At $3695, this PC will never make it down to the bargain basement. But if top-notch service and support and high-class design—combined with good performance—are worth some extra dollars to you, this might be just the PC you're looking for. If performance is your prime consideration, however, you can find equal or better for hundreds less.

NEC Image 466es

VITAL STATISTICS

Street price: $3510
Processor: Intel 486DX2-66
PROS: Top performance, great monitor, integrated SCSI
CONS: A little pricey
Contact: NEC, 800/388-8888
Reader service no. 686

The beautifully designed NEC Image 466es runs circles around much of the competition, outpacing most DX2-66s—and almost nailing a Best Buy. The NEC raced through our Windows Freelance test a staggering 50 percent faster than our average 66. This compact comes with a 238-pin ZIF CPU socket, 8MB of RAM (upgradable to 128MB), a 256K secondary cache, an integrated local bus graphics accelerator, and a spacious 420MB Western Digital Caviar hard drive. Top all this off with NEC's stellar 4FGe 15-inch flat-screen monitor, and you've got a system bound to entice users of graphical Windows apps.

The motherboard integrates a SCSI port (there's also an external port). Four expansion slots are free (two accept VL cards). You can set up the case in either a desktop or a tower configuration, but be careful: The lightweight modular design gives you easy access to all the components, but some can come loose if you move the PC around with the top case off.

NEC offers a generous three-year warranty, with on-site service free for the first year and a reasonable $75 a year for the next two. Top-notch phone and fax technical support is available 12 hours a day but not on weekends. The Image 466es's great design comes at a cost, although $3510 isn't bad considering the fine video subsystem and other perks. Fast, flexible, and expandable, the NEC Image 466es should be a sound long-term investment.

Netis N4D266VL

VITAL STATISTICS

Direct price: $2385
Processor: Intel 486DX2-66
PROS: Top service and support, great price, good performance
CONS: Cluttered motherboard layout
Contact: Netis Technology, 408/263-0368
Reader service no. 687

The Best Buy Netis N4D266VL proves that you don't have to spend big bucks to get a system that really hums and is backed by great support. This $2385 PC is about 10 percent faster overall than our average 486DX2-66, and Netis doesn't short you on features—you get a 238-pin ZIF CPU socket, a 340MB hard drive, and a 2MB Promise Technology VL-Bus caching hard disk controller. The latter undoubtedly contributed to the N4D266VL's very good performance on our Paradox benchmark. Another classy performance perk is the Diamond Viper VLB graphics accelerator with 2MB of VRAM. Expandability is solid too, with four free 16-bit slots, one free 8-bit slot, and two free externally accessible 5¼-inch drive bays.

As you'd expect, the Netis doesn't include design fine points found in more expensive PCs. All eight 30-pin memory sockets are filled with 1MB SIMMs in the 8MB RAM configuration. To upgrade, you must pull at least four of them and install four 4MB SIMMs. The smart way to buy this system (unless you plan never to upgrade memory) is configured with 16MB of RAM (four 4MB SIMMs and four RAM sockets free). Netis's outstanding system price—the second best here—will ease the extra bite on your wallet.

The N4D266VL's internal layout isn't perfect: It's a bit cramped, and the CPU socket sits at the end of the four free slots, where a high heat sink could prevent all but half-length cards from fitting in three of the 16-bit slots. But service and support is terrific; toll-free tech help is available 10 hours a day, six days a week. Support responsiveness and accuracy are standouts, and Netis ties for fifth in our service-and-support rankings. The company fills out its policies with a one-year warranty, on-site service for $80 a year, and a 30-day money-back guarantee. Despite a few rough edges, the Netis N4D266VL's fine performance, low $2385 price, and super support make it the hands-down winner for top overall Best Buy.

"We were blown away by the Micro Express, which beat its nearest competitors by a fantastic 24 percent margin"

PC WORLD

ME 486DX2/66

"Our top overall value, the Best Buy Micro Express ME 486-VL/DX2/66, is a 66-MHz local bus machine with the fastest performance overall... Furthermore, the company's service and support topped the chart, just as it did in June.

"It's no surprise that 486DX2s are the quickest machines... but we were blown away by the Micro Express, which beat its nearest competitor by a fantastic 24 percent margin."

PC World, August 1993

"...with its superior product warranty and support, and outstanding processor speed, it also reflects...quality and exceptional engineering that could propel Micro Express to become a major player in the computer industry."

Computer Buyer's Guide, January 1993

"The Micro Express ME 486-Local Bus/DX2/66 has the lowest price of the bunch. This system showed itself to be a fine performer...."

InfoWorld, November 16, 1993

$1999

- Intel 486DX2/66 Processor
- Socket for Intel Pentium P24T chip
- 4 MB of RAM upgradable to 32 MB
- 256 KB external cache memory
- 32-bit VESA cache controller with 1 MB RAM (1024 x 768 res., 256 colors)
- 5.25" & 3.5" Floppy Disk Drives
- 210 MB IDE Hard Disk Drive upgradable to 2.4 GB
- 14" Super VGA monitor with 1024 x 768 resolution, .28mm dot pitch
- Two serial and One parallel ports
- 101 Keyboard and Mouse
- MS-DOS 6.0 and Windows 3.1
- 2 Year Parts & Labor Warranty
- 30-Day Money Back Guarantee

Call for Custom Configuration Pricing

1-800-989-9900

intel inside

MICRO EXPRESS

1801 E. Carnegie, Santa Ana, CA 92705

Phones: (800) 989-9900; (714) 852-1400; fax (714) 852-1225

Prices and specifications are subject to change without notice.

Circle 157 on reader service card

Polywell Poly4586-66VC

VITAL STATISTICS

Direct price: $3985
Processor: Intel 486DX2-66
PROS: Multimedia setup, tape backup unit
CONS: Relatively high price
Contact: Polywell Computers Inc., 800/999-1278
Reader service no. 688

Polywell's Poly4586-66VC is a first-class PC—but its $3985 price won't win a bargain hunter's heart. However, a 238-pin ZIF CPU socket, 16MB of RAM, a 425MB hard drive, two floppy drives, a double-speed CD ROM drive, a sound card, speakers, and a great video setup justify the cost. Add a Conner CP250 tape backup unit that backs up approximately 250MB compressed on a single tape, and the picture looks even brighter. Performance tested about average overall but outstanding (63 percent faster than our average system) on Paradox.

The thoughtful design of this midsize tower leaves room for three full and two half-length 16-bit cards. There's one free externally accessible bay, and an optional internal cage will hold three more.

Polywell support is fantastic, with a five-year labor warranty (two years' free parts), a year of on-site service for $75, and toll-free tech support 9 hours a day weekdays and Saturdays. We got nothing but accurate, immediate responses. As a result, Polywell ties for fifth with Netis for service and support. This system may not be a bargain, but it's a solid value and fairly priced for all its extras.

Tagram Concerto Hi-Note 486DX2-66

VITAL STATISTICS

Direct price: $2520
Processor: Intel 486DX2-66
PROS: Multimedia setup, good price, excellent support
CONS: Relatively slow performance
Contact: Tagram Systems Corp., 800/824-7267, 714/258-3222
Reader service no. 689

If this were a multimedia review, we'd give the Tagram Concerto a standing ovation. But as a *power* system, the Concerto almost misses its entrance, ranking among the slowest PCs here. The 250MB hard drive is on the small side for a power system, and the standard configuration is 8MB—with 30-pin 1MB SIMMs filling all the sockets.

The Tagram provides a 238-pin ZIF CPU socket, a Voyetra Audio 16 sound card, a CD ROM drive, a long list of CD ROM titles, and a Proton monitor with built-in speakers.

We can't kick about the outstanding $2520 price. Tagram cuts costs with a VLB card from BCM Advanced Research that handles the graphics accelerator, hard drive adapter, and I/O. You get five expansion slots (one VL) and one externally accessible 3½-inch drive bay free.

Service is great, with a two-year warranty, a year of free on-site service, and one-day turnaround on repairs. Super-responsive tech support is available 11 hours a day, six days a week. As you can see, when it comes to price, service and support, video subsystem, and multimedia extras, this system has a lot going for it. But it just doesn't have the performance it takes to entice a power user.

Zeos 486DX2-66

VITAL STATISTICS

Direct price: $2932
Processor: Intel 486DX2-66
PROS: Excellent performance, low price
CONS: Longish waits for tech support
Contact: Zeos Int'l, Ltd., 800/554-5220, 612/623-9614
Reader service no. 690

Considering the furious PC price cuts in the last couple of years, some may have thought Zeos would have trouble producing a competitive PC. The naysayers will have to think again. The Best Buy Zeos 486DX2-66 proves the business PC market hasn't bypassed this Minnesota-based direct vendor.

The Zeos 486DX2-66 comes with 8MB of RAM (expandable to 64MB) and a 256K secondary cache. It arrives ready to handle the most demanding storage needs with a big 528MB IDE hard drive and a fast Diamond Viper VLB accelerator card with 1MB of VRAM. And this system performs: The Zeos flew through our Windows tests as if shot from a cannon. Overall, it placed just 5 percent behind the fastest non-Pentium machine reviewed, outpacing our average 486DX2-66 by more than 15 percent. While the Zeos dropped a few places in our DOS-based BAPCo tests, its Windows benchmarks are more than impressive, surpassing those of our average 66-MHz system by almost 25 percent.

But there's more than speed and price to a PC. Zeos includes thoughtful touches, with a well-designed motherboard that allows easy access to expansion slots, cache sockets, and the 238-pin ZIF socket holding the CPU. While access to system RAM under one of the two installed floppy drives is a little tight, two open 72-pin sockets are in the clear and waiting for future upgrades. Finally, the Zeos offers excellent overall expandability, with six free ISA slots, one free VL slot, and an integrated internal SCSI port (but you'll have to buy the optional host adapter chip to enable it).

Zeos's service package is competitive, with a 30-day money-back guarantee, toll-free 24-hour tech support, and a one-year warranty. Zeos representatives answered our queries accurately, but we did find ourselves on hold for 10 minutes before getting through. Overall, this PC is a super Best Buy value, with fantastic speed and great expandability—and Zeos even throws in a free Lotus Windows application. That's a pretty irresistible combination.

"Overall, this is the best low-cost PC we've ever reviewed – bar none!"

PC WORLD

ME 486DLC/40

"The top overall value is the Micro Express ME 486DLC/40. This standout system is built around the new Cyrix DLC chip, and it presented a staggering résumé, nailing down an excellent rating on performance, price *and* service and support…

"Say something good about this machine. Go ahead. And while you're at it, heap on a bunch of superlatives–chances are you'll be right on the mark! Overall, this is the best low-cost PC we've ever reviewed – bar none…This Best Buy PC is an easy winner in every category"

PC World, June 1993

"The Micro Express ME 486DLC/40 posted the fastest speed results…"

InfoWorld, February 8, 1993

"We've always been impressed with the great value that Micro Express systems offer, and this latest 486 upholds that tradition…It's a great machine at a great price."

Computer Buyer's Guide, February 1993

OBG&H BEST BUY

BUYER'S ASSURANCE SEAL — wcMCB RECOMMENDED PRODUCT

PC MAGAZINE EDITORS' CHOICE

THE PC/COMPUTING 200 BEST PC PRODUCTS 1992

$1299

- 486DLC/40 Processor upgradable to DX2-66
- 4 MB of RAM upgradable to 32 MB
- 128 KB RAM cache upgradable to 256 KB
- 170 MB Fast Access Hard Disk Drive upgradeable to 2.4 GB
- 16-bit Windows Accelerator Video Card with 1 MB (1024 x 768 res., 256 colors)
- 5.25" & 3.5" Floppy Disk Drives
- 14" Super VGA color monitor with 1024 x 768 resolution, .28 mm dot pitch

to 486S with 32-bit VESA HD Controller & Video Card **$1399**

- Two serial and One parallel ports
- 101 Keyboard and Mouse
- MS-DOS 6.0 and Windows 3.1
- 2 Year Parts & Labor Warranty
- 30-Day Money Back Guarantee

Call for Custom Configuration Pricing

1-800-989-9900

MICRO EXPRESS

1801 E. Carnegie, Santa Ana, CA 92705

Phones: (800) 989-9900; (714) 852-1400; fax (714) 852-1225

Prices and specifications are subject to change without notice.

Circle 157 on reader service card

System Snapshots

These systems, while very capable, don't match the preceding group for overall value in a business environment. However, many of them present unique and valuable solutions to end-user needs.

ALR Flyer VL 4/50d

DIRECT PRICE: $2906 **PROCESSOR:** Intel 486DX2-50 **PROS:** Energy Star compliance, generous warranty **CONS:** Limited expandability

The ALR Flyer VL 4/50d's ultrasleek low-rise case looks fantastic—and its Energy Star rating indicates power savings. ALR designed well, leaving room to grow the 8MB of RAM to 24MB without pulling any SIMMs (36MB is the ceiling) and squeezing in a tiny proprietary 16-bit slot for an optional fax-modem, ethernet adapter, or SCSI adapter. Expandability, however, is limited to one free drive bay and two free 16-bit slots, so if you like to add drives, this is not your system. This PC *is* fast for a 50, about 15 percent faster overall than the average DX2-50. But stacked up against the 66-MHz competition, the ALR was 17 percent slower than the average DX2-66.

As mentioned in the review of ALR's Pentium system, this company's service and support is fine. But the Flyer's $2906 price is a little steep, and the ultracompact design is limiting. If desk space is tight and you don't mind paying for ALR quality, you might consider this box—but we think most buyers will find a better fit elsewhere. *Advanced Logic Research, 800/444-4257, 714/581-6770.* **Reader service no. 691**

CAF Master L737 DX2/66

STREET PRICE: $2495 **PROCESSOR:** Intel 486DX2-66 **PROS:** Very good support responsiveness **CONS:** No toll-free tech support or on-site service

At $2495, this is the third least expensive PC here. In terms of overall performance, it matches our average 66. But its results were erratic: 34 percent faster than average in Paradox, 15 percent slower in Excel. And the 213MB hard drive is smallish for today's power systems, although the 2MB local bus caching controller is a plus. The lack of upgradability is disappointing. The CPU's in a standard ZIF 486 socket, with no 238-pin upgrade path. The 8MB of RAM filling the eight 30-pin SIMM sockets can be expanded to 32MB, but you have to discard existing SIMMs. Four free bays and four 16-bit slots are fine.

CAF doesn't offer on-site service or toll-free support. Tech support, open 9 hours weekdays, is responsive and accurate. If you want top power, this CAF is not for you—check our Best Buys. *CAF Technology, 818/369-3690, 818/369-3690 (fax).* **Reader service no. 692**

Compaq Deskpro 5/60M 510

STREET PRICE: $7200 **PROCESSOR:** Intel Pentium-60 **PROS:** Fast, great monitor and design **CONS:** Highest price in roundup

The Deskpro 5/60M, a fast backplane-designed PC, features a 60-MHz Pentium CPU module. Only the ALR and IBM Pentium systems were faster. The Deskpro provides 16MB of RAM, a 510MB hard drive, four free EISA slots, and two free externally accessible drive bays. And it comes with a superb 17-inch monitor.

Compaq's top-rated service and support includes a three-year warranty, a year of free on-site service, and 24-hour toll-free support. In addition, Compaq throws in its versatile Business Audio, which lets you annotate documents and even command applications by using your voice instead of the mouse or keyboard. What gives us pause is the $7200 price (ouch!). That's a lot, even for a loaded, expandable, modular Pentium system. *Compaq Computer Corp., 800/345-1518, 713/378-8820.* **Reader service no. 693**

Tri-Star 486DX2/66 VL Station

DIRECT PRICE: $4595 **PROCESSOR:** Intel 486DX2-66 **PROS:** CD ROM drive, 17-inch Mag monitor, removable hard drive **CONS:** Relatively high price

The Tri-Star 486DX2/66 tower's system specs seem tailored to power users: 16MB of RAM, a 256K secondary cache, a 4MB Promise VLB caching controller, a double-speed Texel CD ROM drive, and a 3MB Orchid ProDesigner VLB graphics accelerator. We expected blazing performance, but our Tri-Star coasted to a subaverage showing. And there's no CPU upgrade path for the future. The 424MB removable hard drive is a nice touch, and Tri-Star throws in a superb 17-inch Mag monitor.

Support is solid, with a year of free on-site service and good toll-free support. Removable hard drives are expensive, and this is a solid PC with 424MB of fast, totable storage. (At press time, Tri-Star informed us of a price drop to $3995—considerably enhancing this PC's value.) *Tri-Star Computers, 602/961-3401.* **Reader service no. 694**

Unisys PW2 Advantage Plus Model 4666

STREET PRICE: $6792 **PROCESSOR:** Intel 486DX2-66 **PROS:** Ethernet adapter, CD ROM drive, 1.2GB hard drive **CONS:** Very high price, so-so service

You expect to pay for performance, but not almost $6800 for a fast DX2-66. This server/high-end PC has five 32-bit EISA slots (one occupied by an Ethernet card), a 1.2GB SCSI drive, and a Toshiba CD ROM drive.

You get 16MB of RAM (upgradable to 128MB), a 238-pin upgrade socket, and two free drive bays. One (major) minus for non-server use: The monitor supports SVGA resolutions—but not with flicker-fighting refresh rates. And Unisys service-and-support policies aren't optimum. For example, free tech support lasts just 90 days from purchase, although you do get a year of free on-site service. Though Unisys gives you a lot of system, we think premium price should be paired with premium service. *Unisys, 800/874-8647.* **Reader service no. 695**

USA Flex VL486DX2-66

DIRECT PRICE: $2995 **PROCESSOR:** Intel 486DX2-66 **PROS:** Multimedia setup, excellent service and support **CONS:** Single-speed CD ROM drive

The VL486DX2-66 comes with a 238-pin ZIF CPU socket, a 340MB hard drive, a CD ROM drive, a sound card, and speakers—at an affordable $2995. Unfortunately, the CD ROM drive is based on older single-speed technology. And you have to yank at least four 1MB SIMMs to upgrade beyond the standard 8MB.

Performance is subpar. USA Flex's service and support is strong, providing around-the-clock toll-free tech support. Responsiveness was immediate, and we got correct answers on all but one of our questions. You also get a year of free on-site service. Despite its extras, however, this USA Flex model doesn't provide the high-end performance we're looking for in this review. *USA Flex, 800/876-5604, 708/351-7204 (fax).* **Reader service no. 696**

Top-End Performance: Pentium Rules

	Word for Windows 2.0	Excel 4.0	Paradox 3.5 in DOS window	Freelance for Windows 1.0	BAPCo SYSmark92
ALR Evolution V Intel Pentium-60	82	56	81	84	275
IBM PC Company ValuePoint P60/D* Intel Pentium-60	79	54	100	88	217
Compaq Deskpro 5/60M Model 510 Intel Pentium-60	87	70	83	115	196
AcerPower Series 9000 Intel Pentium-60	85	70	81	106	171
NEC Image 466es Intel 486DX2-66	93	74	124	98	176
Gateway 2000 4DX2-66V* Intel 486DX2-66	94	71	124	101	164
Zeos 486DX2-66* Intel 486DX2-66	96	84	115	100	165
Nat'l MicroComputers Pro-System 466 Intel 486DX2-66	106	85	113	117	190
Acma 486/66/DX2 System Intel 486DX2-66	98	83	109	128	180
AST Premmia 4/66d Model 343W Intel 486DX2-66	98	85	119	112	169
Unisys PW2 Advantage Plus 4666 Intel 486DX2-66	104	79	119	109	154
Dell Dimension 466V/XPS* Intel 486DX2-66	103	87	113	100	150
Comtrade EISA VL-Bus Professional 66* Intel 486DX2-66	104	89	111	126	169
Ares 486-66DX2 EISA/VESA Intel 486DX2-66	105	86	141	120	187
Insight 486DX2-66 Smart Server Intel 486DX2-66	101	84	133	118	164
Netis N4D266VL* Intel 486DX2-66	108	94	117	133	164
Tri-Star 486DX2/66 VL Station Intel 486DX2-66	106	87	133	135	163
NCR System 3333 Intel 486DX2-66	104	91	143	107	140
Polywell Poly4586-66VC Intel 486DX2-66	109	96	107	126	131
Blackship BLK 486/66LB Intel 486DX2-66	111	93	142	126	150
CAF Master L737 DX2/66 Intel 486DX2-66	118	101	131	135	146
Diamond DT 486DX2-66 VL-SCSI Intel 486DX2-66	107	92	154	121	132
Tagram Concerto Hi-Note 486DX2-66 Intel 486DX2-66	117	98	163	128	139
USA Flex VL486DX2-66 Intel 486DX2-66	124	107	144	141	115
ALR Flyer VL 4/50d Intel 486DX2-50	155	116	183	151	153

*Best Buy

Systems arranged in order of overall speed, with fastest at top. Results are in seconds (lower is better) except for the BAPCo SYSmark92 results, given in number of scripts executed per hour (higher is better).

Methodology Systems were configured with DOS 6.0 and 8MB or 16MB of RAM. We configured Windows with a Hewlett-Packard LaserJet III as the default printer, disabled Print Manager, and attached a null printer to LPT1. We loaded the test applications and files, Microsoft Test automation software, and the test-automation scripts.

Word for Windows 2.0 We check spelling and scroll through a 27-page document; create, format, print, and save a one-page business letter; and open a business proposal, add a paragraph, then preview and print.

Excel 4.0 We do data extracts; build, format, and print a financial statement; open a mortgage analysis, scroll, move blocks, change the interest, print-preview, and save.

Paradox 3.5 in DOS window We perform a variety of data entry, searching, updating, and reporting tasks.

Freelance for Windows 1.0 We load a one-page starter file, enter text, add a page, and enter bulleted items. Then we add pages containing 3-D bar charts and import data from a WK1 file. We preview a slide show, applying various views, then save the presentation to disk.

BAPCo SYSmark92 We run a script that loads PageMaker 4.0, dBASE IV 1.1, Harvard Graphics 3.0, 1-2-3 3.1, Microsoft C 6.0, Excel 3.0, Word for Windows 2.0, Paradox 3.5, Quattro Pro 3.0, and WordPerfect 5.1 and executes a variety of typical tasks with each.

Data based on tests designed and conducted by the PC World Test Center except BAPCo SYSmark92, an industry-standard test developed by the Business Application Performance Corporation. All rights reserved.

FEATURES COMPARISON

High-End Pentiums, DX2-66s Pack Hefty RAM and Storage

● Yes
○ No
n/a = not applicable

	AcerPower Series 9000	Acma 486/66/DX2 System	ALR Evolution V	ALR Flyer VL 4/50d	Arex 486-66DX2 EISA/VESA	AST Premmia 4/66d Model 343W	Blackship BLK 486/66LB	CAF Master L737 DX2/66	Compaq Deskpro 5/60M Model 510/1020/W	BEST BUY Comtrade EISA VL-Bus Professional 66	CTX 4866
Standard features											
Selling price as of 10/1/93[1]	$5800	$3495	$5088	$2906	$3295	$3967	$1995	$2495	$7200	$3295	$2995
CPU	Pentium-60	486DX2-66	Pentium-60	486DX2-50	486DX2-66	486DX2-66	486DX2-66	486DX2-66	Pentium-60	486DX2-66	486DX2-66
CPU/upgrade socket	Pentium	238-pin ZIF	Pentium	238-pin	238-pin ZIF	238-pin ZIF	238-pin ZIF	ZIF 486DX2	Pentium	ZIF 486DX2	238-pin ZIF
BIOS	Acer 7/1/91	AMI 11/11/92	Phoenix 1.02.01m	Phoenix 4/19/93	AMI 6/6/92	AST 10/22/93	AMI 11/11/92	AMI 11/11/92	Compaq 4/28/93	AMI 1/15/93	AMI 1/15/93
Installed/maximum RAM (MB)	16/128	16/32	16/128	8/36	8/256	8/128	8/64	8/32	16/136	8/128	8/128
30-pin or 72-pin SIMM chips	72-pin	30-pin	72-pin	72-pin	72-pin	72-pin	30-pin	30-pin	72-pin	30-pin	30-pin
SIMM sockets/number free	4/0	8/4	4/0	2/1	4/2	4/2	8/0	8/0	4/0	8/0	8/0
Secondary cache installed/maximum (K)	256/1024	256/256	256/256	256/256	256/512	256/512	256/1024	256/256	256/256	256/256	256/256
Case style	desktop	tower	compact	pizza box	tower	compact	minitower	desktop	desktop	compact	compact
Free externally accessible 3½-inch/5¼-inch drive bays	0/2	0/2	0/2	0/1	0/3	0/2	1/1	2/1	0/2	0/2	0/2
Free internal 3½-inch/5¼-inch drive bays	0/0	1/2	2/0	0/0	0/1	1/0	0/0	0/1	0/0	0/0	0/0
Free 32-bit EISA/16-bit ISA/8-bit ISA expansion slots	6/0/0	0/4/0	0/3/0	0/2/0	4/0/0	5/0/0	0/5/0	0/4/0	4/0/0	2/2/0	2/2/0
PCI or VL bus slots/number free[3]	2VL/1	2VL/0	3VL/1	1VL/0	3VL/1	0/0	2VL/0	2VL/0	0/0	2VL/1	2VL/1
Hard disk	Fujitsu M2691	Conner CP30544	Conner CP30544	WD Caviar 2250	WD Caviar 2340	WD Caviar 2340	Quantum Prodrive	Maxtor 7213AT	Conner CP3541	Conner CP30544	Conner CP30544
Size (MB)	520	544	544	256	340	340	244	213	510	544	544
Adapter	integrated SCSI	4MB OEM DC-680 VLB	4MB Promise DC-6880 VLB	1MB Promise DC-680 VLB	2MB Intelysis DC-680 VL Bus	integrated	Blackship OEM VLB	2MB Promise DC-4030 VLB	integrated	4MB DT C3290-ASE EISA SCSI	4MB DT C3290-ASE EISA SCSI
Floppy drives (MB)	1.44	1.2, 1.44	1.44	1.44	combo	1.2	1.2, 1.44	1.2, 1.44	1.2	1.2, 1.44	1.2, 1.44
Graphics adapter	Diamond Viper VLB	Diamond Viper VLB	ATI Mach 32	integrated WD 90C33 local bus	Hercules Graphite	integrated ATI Mach 32	Cirrus Logic Mach Speed	Cirrus Logic Mach Speed	Compaq QVision	Diamond Viper VLB	Diamond Viper VLB
Installed VRAM/DRAM (MB)	2/0	2/0	2/0	0/1	2/0	0/1	0/1	0/1	2/0	2/0	2/0
Monitor	AcerView 76i	Mag MX15F	ALR Flex-View 3xNI	ALR Flex-View 3xNI	CTX CPS-1560LR	AST SVGA LR	KFC CK1428A	CAF CN 1470	QVision 170	CTX CPS-1560LR	CTX CPS-1560LR
Screen diagonal (inches)/dot pitch (mm)	17/.28	15/.28	14/.28	14/.28	15/.28	17/.28	14/.28	14/.28	17/.28	15/.28	15/.28
Modem fax/data speed (bps)	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sound board	○	○	○	○	○	○	○	○	○	○	○
CD ROM drive	Sony 541	○	○	○	○	○	○	○	○	○	○
Sequential data-transfer rate (kilobytes per second)	150	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Parallel/serial/mouse/MIDI-game/audio/SCSI ports	1/2/1/0/0/2	1/2/0/1/0/0	1/2/1/0/0/0	1/2/1/0/0/0	1/2/0/1/0/1	1/2/1/1/0/0	1/2/1/1/0/0	1/2/1/1/0/0	1/2/1/0/1/0	1/2/1/1/0/1	1/2/1/1/0/1
Service and support											
Warranty (months)	12	12	60/15[7]	60/15[7]	24[8]	36	12	12	36	36	36
30-day money-back guarantee	●	●[12]	●	●	●[13]	○	●	●	○	●	●
On-site service price for first year	free	free	free	free	free	free	free	[14]	free	free	free
Turnaround policy (days at service center)	3	3	3	3	3	○	2	3	2	2	2
Weekday toll-free phone support (hours)	24	11	11	11	24	24	9	9[17]	24	12	12
Weekend support	●	○	●[19]	●[19]	●	●	○	○	●	●[19]	●[19]
BBS	●	●	●	●	●	●	●	○	●	●	●
Fax	●	●	●	●	●	●	●	●	●	○	○

[1] All system prices includes DOS 6.0, Windows 3.1, SVGA, a color monitor, a keyboard, and a mouse. Selling price is direct or based on vendor estimate.

[2] Can use either two PCI cards/two ISA cards or one PCI card/three ISA cards.

[3] VL slots also accept 16-bit cards.

[4] Supplemented by 80MB Versadrive removable hard disk.

[5] Includes ethernet port.

[6] SCSI port needs optional SCSI host adapter chip to enable.

[7] 60 months parts, 15 months labor.

	BEST BUY Dell Dimension 466V/XPS	Diamond DT 486DX2-66 VL-SCSI	BEST BUY Gateway 2000 4DX2-66V	BEST BUY IBM PC Company ValuePoint P60/D	Insight 486DX2-66 Smart Server	Nat'l MicroComputers Universal Pro-System 466	NCR System 3333	NEC Image 466es	BEST BUY Netis N4D266VL	Polywell Poly4586-66VC	Tagram Concerto Hi-Note 486DX2-66	Tri-Star VL Station 486DX2/66	Unisys PW2 Advantage Plus Model 4666	USA Flex VL486DX2-66	BEST BUY Zeos 486DX2-66
	$3318	$2799	$2995	$4999	$2799	$3404	$3695	$3510	$2385	$3985	$2520	$4595	$6792	$2995	$2932
	486DX2-66	486DX2-66	486DX2-66	Pentium-60	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66	486DX2-66
	238-pin ZIF	238-pin ZIF	238-pin ZIF	Pentium ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	238-pin ZIF	ZIF 486DX2	238-pin ZIF	238-pin ZIF	238-pin ZIF
	Phoenix 010A01	AMI 2/17/93	Phoenix 1/15/88	AMI 11/11/92	AMI 11/11/92	AMI 11/11/92	NCR 6/14/93	NEC 486ES 1.00.02	AMI 6/6/93	AMI 6/6/92	AMI 6/6/92	AMI 11/11/92	Phoenix 1.00.02	AMI 7/15/93	Phoenix 8/2/93
	16/64	8/128	16/64	16/128	8/32	16/64	8/64	8/128	8/32	16/64	8/32	16/32	16/128	8/32	8/64
	72-pin	30-pin	72-pin	72-pin	30-pin	30-pin	72-pin	72-pin	30-pin	72-pin	30-pin	30-pin	30-pin	30-pin	72-pin
	4/3	8/0	4/0	4/2	8/0	8/4	4/2	4/3	8/0	4/3	8/0	8/4	8/4	8/0	4/2
	256/256	256/512	256/256	256/256	256/256	256/256	64/256	256/256	256/256	256/256	256/256	256/256	128/256	128/256	256/256
	compact	desktop	desktop	compact	tower	desktop	minitower	compact	desktop	tower	minitower	tower	desktop	desktop	desktop
	0/2	1/1	0/2	0/2	4/0	0/2	0/2	0/2	0/2	0/1	1/0	0/1	0/2	1/2	1/1
	1/0	0/0	0/1	1/0	0/0	1/0	2/0	0/0	0/0	2/0	0/0	2/2	0/0	1/0	0/1
	0/5/0	1/3/0	0/5/0	0/3/0[2]	0/5/0	0/5/0	0/4/0	0/2/0	0/4/1	0/5/0	0/4/0	0/1/1	4/0/0	0/4/0	0/5/1
	2VL/1	2VL/0	2VL/1	2PCI/2[2]	2VL/0	2VL/0	2VL/1	2VL/2	2VL/0	2VL/0	2VL/1	3VL/1	0/0	2VL/0	2VL/1
	WD Caviar 2340	Seagate ST2383N	WD Caviar 2420 SCSI	WD Caviar 2420	WD Caviar 2340	WD Caviar 2340	WD Caviar 2340	WD Caviar 2420	WD Caviar 2340	WD Caviar 2420	WD Caviar 250	WD Caviar 424	Seagate ST11200N	WD Caviar 2340	Seagate ST3655A
	340	320[4]	424	424	340	340	340	420	340	425	250	424	1200	340	528
	integrated	Nextor NXt-82 VLB	integrated VLB	integrated	OEM VLB	4MB Promise DC-4030 VLB	integrated	integrated	2MB Promise DC-4030 VLB	Morse 8020 IDE Blazer VLB	BCM Advanced Research	4MB Promise DC-680 VLB	integrated SCSI	Data Tech-nology DTC-2272 VLB	integrated
	combo	1.2, 1.44	1.2	1.44	1.2, 1.44	combo	1.2	1.44	1.2, 1.44	1.2, 1.44	1.2, 1.44	combo	1.44	1.44	1.2, 1.44
	Diamond Viper VLB	WD Paradise	ATi Ultra XLR	integrated PCI-ATI/ 68800	Boca SVGA XL1	STB Pegasus VL	Diamond Viper VLB	integrated local bus	Diamond Viper VLB	No. 9 Computer Co. GXE	BCM Advanced Research	Orchid P9000VLB	integrated ATI 68800	Color Design-er Local Bus AVGA3B	Diamond Viper VLB
	2/0	0/1	0/2	1/0	0/1	4/0	2/0	0/1	2/0	2/1	0/1	2/1	1/0	0/1	1/0
	Dell Ultra-Scan 15FS	CTX CMS-1461	Crystal-Scan 1572FS	IBM	Mag MX17E	MicroScan Model 46	NCR Ergonomic	NEC 4FGe	ETC Model CA-1565	MicroScan 4G ADI	Proton	Mag MX17F	Unisys	CTX CVP-5468NI	Zeos color VGA
	15/.28	14/.28	15/.28	15/.28	17/.28	15/.28	15/.28	15/.28	15/.28	15/.28	14/.28	17/.26	14/.28	14/.28	14/.28
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	○	○	○	○	○	○	○	○	○	LaserWAVE Supra 16	Voyetra Audio 16	○	○	Axtech NX Stereo Pro	○
	○	○	Mitsumi	○	○	○	○	○	○	OEM CR562-B	OEM CR562-B	Texel/DM-3024	Toshiba XM3401B	Mitsumi	○
	n/a	n/a	300	n/a	n/a	n/a	n/a	n/a	n/a	300	300	320	150	150	n/a
	1/2/1/ 1/0/0	1/2/1/ 1/0/1	1/2/1/ 0/1/0	1/2/1/ 0/0/0	1/2/1/ 1/0/0	1/2/0/ 1/0/0	1/2/1/ 0/0/0	1/2/1/ 0/0/1	1/2/1/ 1/0/0	1/2/0/ 0/0/0	1/2/1/ 1/1/0	1/2/1/ 1/1/0	1/2/1/ 1/0/1[5]	1/2/1/ 0/1/0	1/2/0/ 0/0/1[6]
	12	15/24[9]	12	12	12	12/24[10]	36	36	12	24/60[11]	24	24	12	12	12
	●	●	●	●	●	●	●	●	●	●	●	●	○	●	●
	free	$75	free	free	[14]	$39	free[15]	free[16]	$80	$75	free	free	free	free	$49
	7	2	○	○	3	1	1	○	2	3	1	7	○	2	3
	24	9	18	24	24	9	24	12	10	9	11	11	8[18]	24	24
	●	●[19]	●[19]	●	●	○	●	○	●[19]	●[19]	●[19]	○	○	●	●
	●	●	●	●	○	●	●	●	●	●	●	●	●	●	●
	●	●	●	●	●	●	○	●	●	●	●	●	●	●	●

[8] Lifetime labor warranty.
[9] 15 months parts, 24 months labor.
[10] 12 months parts, 24 months labor.
[11] 24 months parts, 60 months labor.
[12] 45-day money-back guarantee.
[13] 60-day money-back guarantee.
[14] No on-site service option.
[15] Free for 36 months.
[16] $75 per year for second and third years.
[17] Not toll free.
[18] 90 days free tech support.
[19] Saturday only.

Superior In E

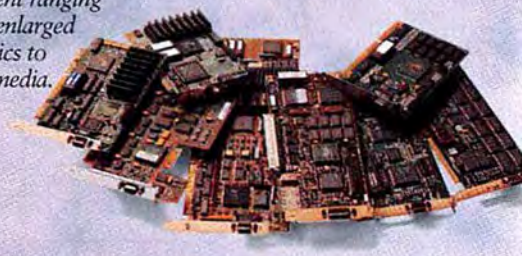
Every Nanao monitor undergoes intense scrutiny and testing to ensure maximum performance and product reliability. Our quality control processes and technical standards are among the most rigorous in the industry.

Our new line of Ecological Design® Monitors incorporates advanced energy-saving features including PowerManager, which cuts power as much as 93% when the monitor is not in use. (After Dark screen saver software free with each monitor.)

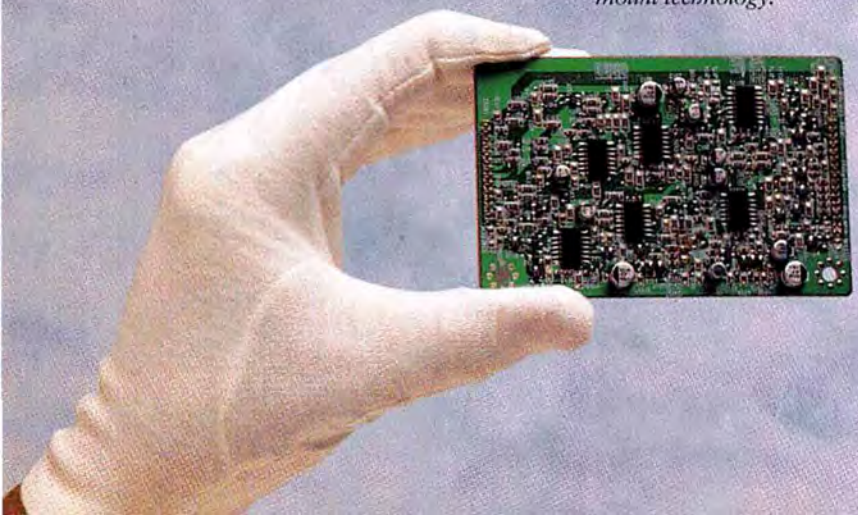
Nanao was the first monitor company to join in partnership with the EPA Energy Star Program. Our commitment to bring technical innovation to today's environment ranges from eliminating CFCs in our manufacturing process to using recyclable packaging and paper products.

Nanao's FLEXSCAN family of monitors meets safety specifications for radiation emissions established by the Swedish MPR-II guidelines as well as those of TCO, the Swedish Confederation of Professional Employees. Nanao was the first monitor manufacturer to achieve FCC Class B approval for our 80kHz frequency monitors.

Nanao FLEXSCAN technology is compatible with all of today's popular graphics cards, offering a viewing environment ranging from enlarged graphics to multimedia.



High quality PCB boards are assembled, adjusted and inspected at Nanao's special chip-mounting factory. All PCB boards are built using sophisticated surface-mount technology.



Model	Size	Dot Pitch	Scan Frequency	Recommended Resolution
T660i	20"	0.30mm	H:30-82kHz V:55-90Hz	1280x1024
T560i	17"	0.25mm	H:30-82kHz V:55-90Hz	1280x1024
F760i-W	21"	0.31mm	H:30-78kHz V:55-90Hz	1280x1024
F560i-W	17"	0.26mm	H:30-82kHz V:55-90Hz	1280x1024
F550i-W	17"	0.28mm	H:27-65kHz V:55-90Hz	1024x768
F340i-W	15"	0.28mm	H:27-61.5kHz V:55-90Hz	1024x768

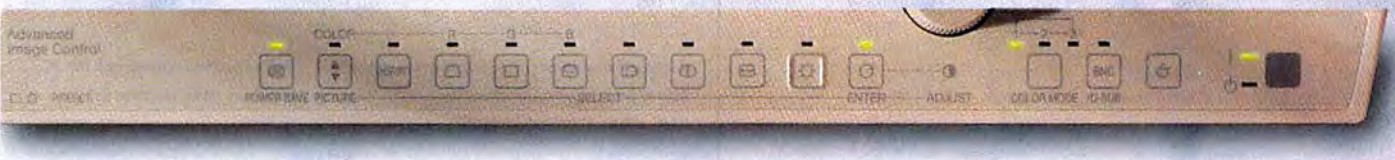
Nanao T-Series and F-Series monitors have captured every major award.

very Detail.

A heritage of precision craftsmanship and attention to detail has been designed into Nanao's family of display monitors.

Our high resolution CRTs deliver a complete range of color displays with photographic quality and brilliant color images to sophisticated applications like CAD, DTP and multimedia. TRINITRON® CRT models offer greater precision and intricate detail, while Nanao's Invar Shadow Mask Flat Screen CRT models provide a wide display area and lower distortion image. Both CRTs feature our unique built-in Dynamic Beam Spot Control System that ensures maximum brightness and sharp focus.

To reduce glare, eliminate static electricity, and improve the focus level on the display area, Nanao has developed two anti-reflective innovations: ErgoCoat,™ a protective coating for all F-series monitors, and ErgoPanel,™ a sturdy panel that covers the surface of our T-series monitors.



Our user-friendly front control panel incorporates ergonomic design and ease-of-use as well as a variety of powerful options for customizing images.

At Nanao, details make all the difference in creating our family of professional display monitors. From the product design and manufacturing that takes place in our factory to the end user's working environment, Nanao pays attention to every detail. In engineering. Assembly. Product testing. Quality control. Shipping. Customer support. From the very first days of the company, we set out to be an innovator in monitor technology. And, in a few short years, we have achieved that goal. Today, Nanao has the lowest repair rate in the monitor industry, the highest product reliability, and a fast-growing number of enthusiastic customers. So if you're looking for a superior monitor, start with the details. We do.

NANAO®

NANAO USA CORPORATION
23535 Telo Avenue, Torrance, CA 90505
(310) 325-5202 Fax: (310) 530-1679

1-800-800-5202

Superior in every detail is a registered trademark of Nanao Corporation. All product names are trademarks of their respective companies. © 1993 Nanao USA Corporation. The Energy Star emblem does not represent EPA endorsement of any product or service.

Circle 194 on reader service card

Win a Gateway 486DX2-66

Have you ever contacted your PC maker for service and support? Or has your PC been trouble-free? Tell us about it! Fill out and fax in the questionnaire below—even if you have no problems to report, and even if you have responded to this survey before—and we'll enter you in a drawing to win a Gateway 2000 4DX2-66V, a Best Buy featured in this month's system review.

HOW TO ENTER: Fax your completed questionnaire, along with your name and phone number, to *PC World* at 415/267-1779. If you have trouble connecting to this number, fax your survey to 415/974-7404 or 415/442-1891. Do NOT fax a cover page. If you don't have a fax machine, you can mail your survey to Fax Survey, Box 1-SS, *PC World*, 501 Second St. #600, San Francisco, CA 94107. Send your survey in no later than January 31.

HOW TO FILL OUT THE FORM: FOR BEST RESULTS, PHOTOCOPY THIS PAGE; DO NOT TEAR IT OUT. Clearly print your name (use block capital letters) and your fax number at right; fill the appropriate circle for each digit of your daytime phone number. Then fill out the rest of the questionnaire. WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES! One entry per person per month. Void where prohibited by law.

LAST, FIRST NAME

FAX NUMBER

ZIP CODE

Please fill in your daytime phone number below.

1	○	○	○	○	○	○	○	○	○	○
2	○	○	○	○	○	○	○	○	○	○
3	○	○	○	○	○	○	○	○	○	○
4	○	○	○	○	○	○	○	○	○	○
5	○	○	○	○	○	○	○	○	○	○
6	○	○	○	○	○	○	○	○	○	○
7	○	○	○	○	○	○	○	○	○	○
8	○	○	○	○	○	○	○	○	○	○
9	○	○	○	○	○	○	○	○	○	○
0	○	○	○	○	○	○	○	○	○	○

ABOUT YOUR PC

Who is the manufacturer of the PC you use most frequently?

- ○ Acer
- ○ Acma
- ○ ALR
- ○ Ambra
- ○ Apple
- ○ AST
- ○ Austin
- ○ Axik
- ○ Blackship
- ○ Canon
- ○ Compaq
- ○ CompuAdd
- ○ Compudyne
- ○ CompuTrend
- ○ Cornell
- ○ DEC
- ○ Dell
- ○ DTK
- ○ Epson
- ○ Everex
- ○ Gateway
- ○ Grid Systems
- ○ Hewlett-Packard
- ○ Hyundai
- ○ IBM
- ○ Insight
- ○ Leading Edge
- ○ Micro Express
- ○ Micron
- ○ MIS
- ○ Mitac
- ○ NCR
- ○ NEC
- ○ Northgate
- ○ Packard Bell
- ○ Panasonic
- ○ PC Brand
- ○ Samsung
- ○ Sharp
- ○ Swan
- ○ Tandon
- ○ Tandy
- ○ Tangent
- ○ Texas Instruments
- ○ Toshiba
- ○ Tri-Star
- ○ Twinhead
- ○ Unisys
- ○ USA Flex
- ○ Wang
- ○ Wyse
- ○ Zenith
- ○ Zeos
- ○ Other (specify): _____

Is this PC a...?

- ○ Desktop
- ○ Notebook/laptop
- ○ Hand-held

Is this PC a...?

- ○ Pentium/586
- ○ 80486
- ○ 80386
- ○ 80286
- ○ Other (specify): _____

Where did you purchase this PC?

- ○ Local dealer
- ○ Mail/phone order
- ○ Direct from field sales force
- ○ Membership discount store
- ○ Computer superstore
- ○ Home/electronics store
- ○ Retail store
- ○ VAR
- ○ Other (specify): _____

When did you buy this PC?

- ○ This month
- ○ 1–3 months ago
- ○ 4–6 months ago
- ○ 7–12 months ago
- ○ More than 12 months ago
- ○ Not sure

Would you buy this brand of PC again?

- ○ Yes
- ○ No

Do you use this PC at...? ○ Work ○ Home ○ Both

In terms of PC skills, would you describe yourself as... ○ Novice ○ Intermediate ○ Experienced

WHAT ARE YOU REPORTING? (Check only one.)

- ○ No problems ever
- ○ No problems since last responded to survey
- ○ A problem since last responded to survey
- ○ An older problem not previously reported in this survey

If you're NOT reporting a problem, please fill out the Uptime Report (below).

To REPORT a problem, fill out the Problem Report (right column).

UPTIME REPORT

How many consecutive months has your PC been trouble-free?

- ○ 3 months
- ○ 6 months
- ○ 9 months
- ○ 12 months
- ○ 15 months
- ○ 18 months
- ○ More than 18 months

■ **STOP HERE if you're not reporting a problem.**

PROBLEM REPORT

When you first received your NEW PC, was any component "dead on arrival"? ○ Yes ○ No ○ Don't know

If so, which one was it? (Check all that apply.)

- ○ Battery
- ○ CD ROM
- ○ CPU
- ○ Floppy drive
- ○ Graphics/video board
- ○ Hard drive
- ○ Keyboard
- ○ Memory
- ○ Modem/fax board
- ○ Monitor/screen
- ○ Motherboard
- ○ Mouse
- ○ Power supply
- ○ Sound board
- ○ Other

■ **For the following questions, describe your most recent HARDWARE-related problem with this PC.**

Did you contact the manufacturer for repair service or technical support?

- ○ Yes
- ○ No
- ○ Not sure

What was this problem finally identified as?

- ○ Faulty component
- ○ Incorrectly installed software
- ○ Wrong configuration
- ○ Faulty peripheral
- ○ Device conflicts
- ○ OS problem
- ○ Other
- ○ Don't know

If a component failed, which one was it? (Check all that apply.)

- ○ Battery
- ○ CD ROM
- ○ CPU
- ○ Floppy drive
- ○ Graphics/video board
- ○ Hard drive
- ○ Keyboard
- ○ Memory
- ○ Modem/fax board
- ○ Monitor/screen
- ○ Motherboard
- ○ Mouse
- ○ Power supply
- ○ Sound board
- ○ Other

How many times have you had a problem with this PC?

- ○ This was first time
- ○ Two
- ○ Three
- ○ Four
- ○ More than four

How recently did this problem occur?

- ○ This month
- ○ 1–3 months ago
- ○ 4–6 months ago
- ○ 7–12 months ago
- ○ More than 12 months ago
- ○ Not sure

How long after PURCHASE did this problem occur?

- ○ Less than 1 month
- ○ 1–3 months
- ○ 4–6 months
- ○ 7–12 months
- ○ More than 12 months
- ○ Not sure

Did the problem occur under warranty?

- ○ Yes
- ○ No
- ○ Not sure

■ **For the following questions, describe your most recent SERVICE or SUPPORT experience.**

What type of service/support did you receive?

- ○ Phone
- ○ On-site
- ○ In-store help
- ○ Express system swap
- ○ Express component swap
- ○ Factory return

If phone service, how long were you on hold?

- ○ Not at all
- ○ Less than 1 min.
- ○ 1–2 min.
- ○ 2–5 min.
- ○ 5–10 min.
- ○ 10–20 min.
- ○ More than 20 min.

How long did it take before you talked to the person who finally helped you?

- ○ Less than 1 hour
- ○ 1–24 hours
- ○ 1–2 days
- ○ 3–5 days
- ○ 1 week
- ○ More than 1 week

How long did it take to resolve the problem completely?

- ○ Less than 1 week
- ○ 1–2 weeks
- ○ 3–4 weeks
- ○ More than 1 month
- ○ Never resolved

Was the problem resolved to your satisfaction? ○ Yes ○ No

Based on the service and support you received, would you buy this brand of PC again? ○ Yes ○ No

On the whole, how satisfied were you with the service and support you received?

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

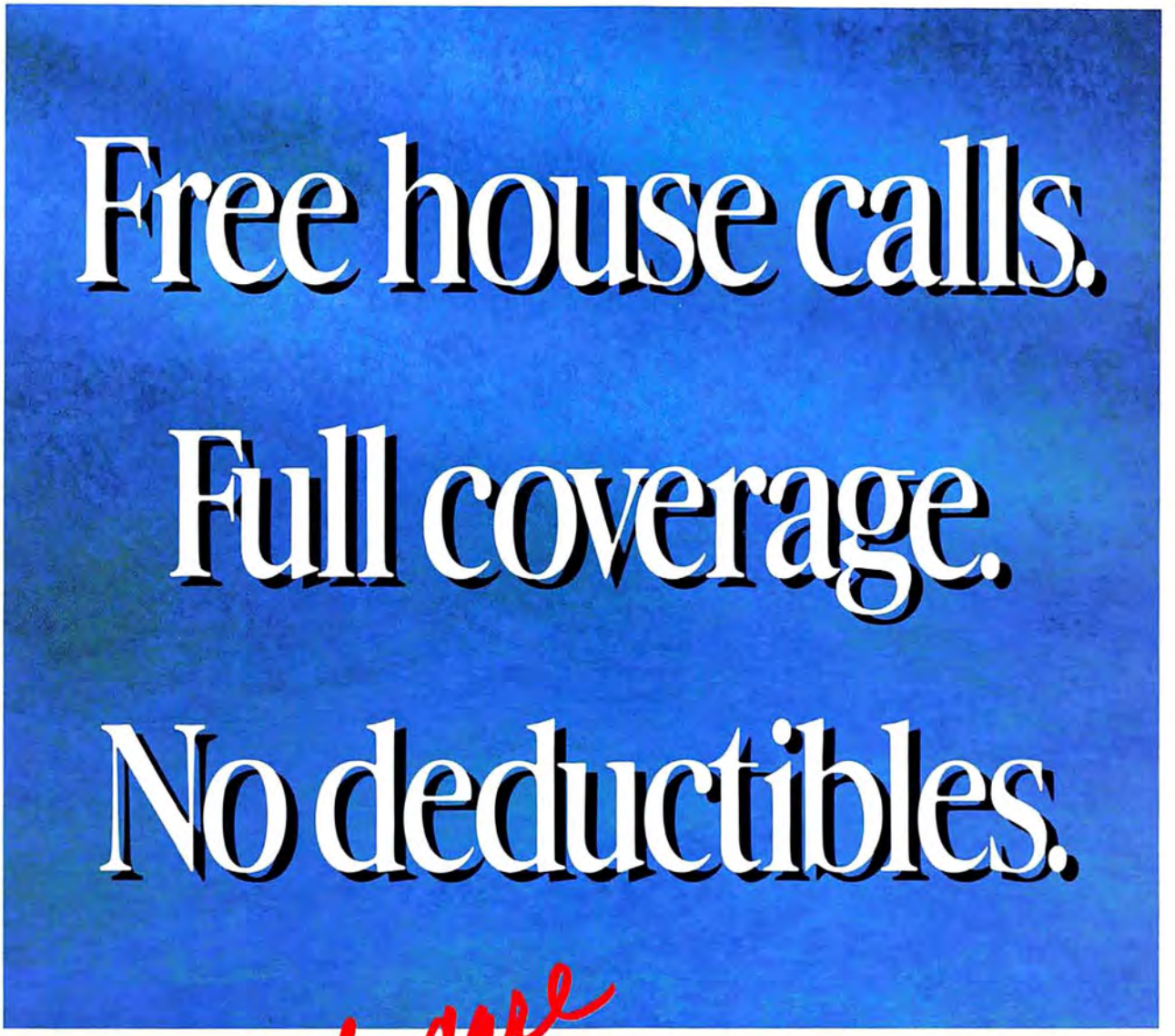
Not at all — Satisfied — Extremely satisfied

How likely is it that you would recommend this brand of PC to a friend or colleague?

○ 1 ○ 2 ○ 3 ○ 4 ○ 5

Not at all — Likely — Extremely likely

PLEASE FAX TO 415/267-1779



Health care reform for PCs

AT&T | NCR An AT&T Company

Just What The Doctor Ordered.

A worry-free warranty for three full years.

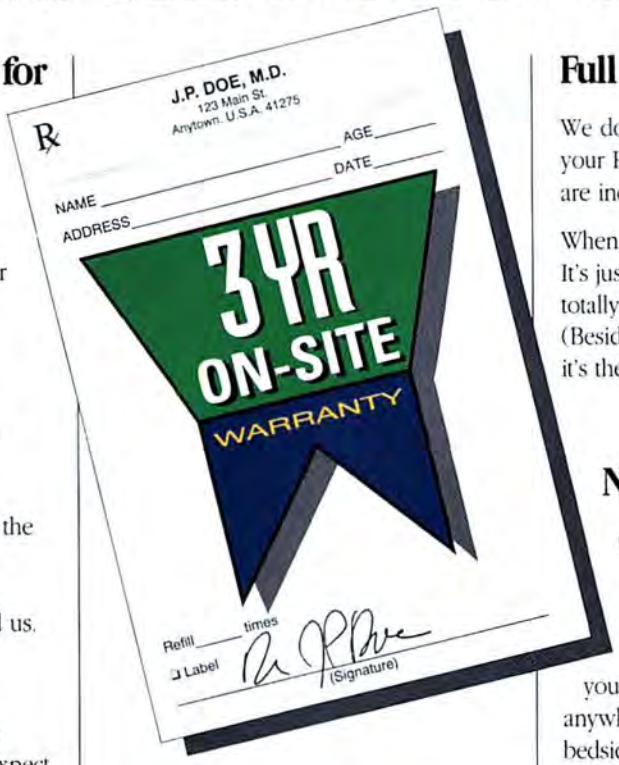
You've got enough worries without having to figure out how to get your PCs fixed. Thanks to NCR, life just got simpler due to our world-class warranty protection.

Only NCR desktop PCs come with a three-year, on-site warranty.

Our desktop warranty is the best in the industry. There's no fine print. No exceptions. Just an old-fashioned promise to be there when you need us.

Free house calls.

House calls for three years? Hard to believe. But what else would you expect from AT&T/NCR? Fact is, we make it down right easy. We come directly to you the next business day. We're there when you need us and not just for the first year...we'll come to you for THREE FULL YEARS.



Full coverage.

We don't scrimp when it comes to getting your PC back on its feet. Parts and labor are included. So's the monitor.

When we say "full coverage" we mean it. It's just one more way to show you we're totally committed to your satisfaction. (Besides, with our product reliability, it's the least we could do.)

No deductibles.

Our desktop warranty has no hidden costs, no upfront service fees. It's absolutely free.

Just think of NCR's warranty as your prescription to the best care anywhere in the United States. (And our bedside manner is darn friendly, too.)

Premium Services.

Superior Support From NCR Service Specialists.

We've been around long enough to know that when something goes wrong, it's important to have someone on-site who knows your system inside and out. That's why we insist on having our own dedicated support staff.

Our warranty is a real dollars and cents commitment to you. It covers all U.S.-installed equipment. We don't expect our systems to bring you anything other than tremendous satisfaction. We've staked our reputation and resources on their quality by giving you a true benchmark for comparison.

24-Hour Toll-Free Techline Support.

That means no more late nights for you at the emergency room. Just call our Techline. It's toll-free, twenty-four hours a day. You'll talk with some of the best-trained folks in the business who will help get your system up and raring to go.

Ask about our 30-Day, no-questions-asked Money-Back Guarantee.

The best way to appreciate an NCR system is to put it through its paces. And, if in a month's time, you find it's just not for you, send it back. We'll refund your money. No questions asked.

We don't want to just satisfy you. We want to delight you.

There's just too much at stake. A system that meets your needs. A hard-won reputation for us.

So, we'll do whatever's necessary to make sure your system stays healthy for the days and nights ahead.

AT&T/NCR technology, a worry-free desktop warranty, and superior support services...

Just what the doctor ordered.

(No appointment necessary.)

Healthy Choices.

NCR 486SX/25

$995

Special Call Now! Offer

- ***Intel486 OverDrive Ready***
- Intel486SX/25 (upgradable to 50MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 120MB Hard Drive (expandable to 1GB)
- 4MB RAM at 70ns (expandable to 32MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- 1MB Video RAM
- 14" SVGA VESA Flicker-Free .39mm Monitor

Super 486 Power For Under $1,000!
Hurry! Limited Quantities Only!

NCR 486SX/25

$1,290
or
$46/month

- ***Intel Pentium OverDrive Ready***
- Intel486SX/25 (upgradable to 50MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 120MB Hard Drive (expandable to 1GB)
- 4MB RAM at 70ns (expandable to 32MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video (Cirrus 5426) w/1MB Video RAM
- 14" SVGA VESA Flicker-Free .39mm Monitor

Performance on a Budget!

NCR 486SX/33

$1,510
or
$1,700
(w/486DX/33)

- ***Intel Pentium OverDrive Ready***
- Intel486SX/33 (upgradable to 66MHz)
- 3 ISA Expansion Slots/3 Drive Bays
- 160MB Hard Drive (expandable to 1GB)
- 4MB RAM at 70ns (expandable to 32MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video (Cirrus 5426) w/1MB Video RAM
- 14" SVGA VESA Flicker-Free .28mm Monitor

Great For Home Or Office!

NCR 486DX2/50

$2,320
or
$83/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/50
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 240MB Hard Drive (expandable to 2GB)
- 8MB RAM at 70ns (expandable to 64MB)
- External Cache Upgradable to 256KB
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Windows TurboCharger Video (Cirrus 5426) w/1MB Video RAM
- 14" SVGA VESA Flicker-Free .28mm Monitor

Outstanding Business Workhorse!

NCR 486DX2/66

$3,510
or
$119/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/66
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 340MB Hard Drive (expandable to 2GB)
- 12MB RAM at 70ns (expandable to 64MB)
- 64KB External Cache (upgradable to 256KB)
- 3.5" Floppy Disk Drive
- VESA Local Bus Video
- Diamond Viper Video (Weitek P9000) w/2MB Video RAM
- NEC 15" SVGA VESA Flat Screen .28mm Monitor

Graphics Powerhouse!

NCR 486DX2/66

$3,405
or
$115/month

- ***Intel Pentium OverDrive Ready***
- Intel486DX2/66
- 2 VESA Expansion Slots/4 ISA Expansion Slots
- 5 Drive Bays
- 520MB Hard Drive (expandable to 2GB)
- 16MB RAM at 70ns (expandable to 64MB)
- 256KB External Cache
- 3.5" Floppy Disk Drive
- Upgradable to VESA Local Bus Video
- SVGA Server Video (Cirrus 5422) w/512KB Video RAM
- 14" SVGA VESA Flicker Free Screen .39mm Monitor

Fantastic File Server!

All NCR Desktop Systems Include:

Microsoft Mouse, Windows 3.1, MS DOS 6.0

Options:

- CD-ROM
- Fax/modems
- Networking cards
- Memory/disk upgrades
- Printers
- A variety of popular applications

intel inside

Microsoft Windows Ready-to-Run

Demand the best. Only with NCR.

- Next business-day service and 24-hour Tech support.
- Free 3-year on-site warranty – parts, labor and monitor included.

AT&T

NCR
An AT&T Company

Call NCR Direct Connect: 1-800-462-3855

NCR products are available through Direct Connect or through your local reseller. Call 1-800-624-7187 for the reseller nearest you.

Healthy Choices For Active People.

Hit the highway with our Road-Ready Systems. They're part of our Mobile Networked Computing strategy that combines NCR's innovative portable technology with AT&T's global communications leadership, like AT&T EasyLink ™ Services, a portable communications network. Our notebooks are smaller, lighter, faster and better-connected than ever before.

Safari 3150

Special Call Now! Offer

Mono
$1,995
FREE 14" Color ESVGA Monitor!
(with 120MB HD Mono Model only)

Passive Color
$2,995
(Call now for price and availability on active color)

Mono
$3,280
or
$111/month

Active Color
$4,420
or
$149/month

- Intel486SX/25 (upgradable to 487)
- 120MB Removable Hard Drive (80MB and 170MB available)
- 3.5" Internal Floppy Drive
- 3-4 Hour Battery-life
- 6.1 lbs. (5.5 mono, 6.3 active color)
- 11"x 8.6" x 1.9" (11" x 8.6" x 1.7" mono)
- 9.5" Double-scan Passive Color Screen (TFT Active color and mono also available)
- 4MB RAM (upgradable to 20MB)
- 1MB Video Memory (mono and active 512KB)
- 1 PCMCIA slot (Type 2)
- Local Bus Video
- Dual Video Display
- Front-mounting Cableless Trackball
- Lightweight AC Adapter
- Enhanced Pre-loaded Software: DOS 6.0, Windows 3.1, Bitfax, Tourguide, AT&T Mail, AccessPLUS and on-line Windows documentation
- 3-year Warranty (first year on-site)

Road-Ready accessories

- **AT&T Keep in Touch PCMCIA Modem 14400 data/9600 fax, cellular ready**
- **DataRace ™ PCMCIA Modem 2400 data/9600 fax**
- **Cellular Phone Interface Cable**
- **PCMCIA Network Interface Cards: 10BaseT, 10Base2 and WaveLAN**
- **Xircom Network Interface Adapters: 10BaseT, 10Base2 and 10Base5**
- **External Battery Charger**
- **Auto Adapter**
- **Extra Batteries, Hard Drives, Carrying Cases, RAM and Other Accessories Available.**

Safari 3180

- Intel486SL/33
- 180MB Removable Hard Drive (250MB available)
- 3.5" Internal Floppy Drive (can be replaced w/2nd battery)
- 3-6 Hour Battery-life (upgradable to 12)
- 6.8 lbs. (6.1 mono)
- 11.7" x 9.3" x 2.1"
- 9.5" TFT Active Color Removable Screen or 9.4" Mono Screen
- 4MB RAM (upgradable to 12MB)
- 1MB Video Memory
- 2 PCMCIA Slots (Type 2) or 1 Slot (Type 3)
- Local Bus Video
- Dual Video Display
- Trackball
- Lightweight AC Adapter
- Enhanced Pre-loaded Software: DOS 6.0, Windows 3.1, Bitfax, Tourguide, AT&T Mail, AccessPLUS and on-line Windows documentation
- 3-year Warranty (first year on-site)

Order AT&T/NCR. We've Made It Easy.

We accept VISA, MasterCard or American Express credit cards. Also, don't forget to ask about your business financing and leasing options through AT&T Capital Corporation.

Hours: 8 AM - 8 PM, Monday through Friday.

MasterCard VISA American Express Card Welcome

Performance, Price, Service, Support.

AT&T | NCR An AT&T Company

Call NCR Direct Connect: 1-800-462-3855

NCR products are available through Direct Connect or through your local reseller. Call 1-800-624-7187 for the reseller nearest you.

NCR is the name and mark of NCR Corporation. AT&T and the AT&T globe design are registered service marks and trademarks of American Telephone and Telegraph Company. The Intel Inside logo, Intel486 and Pentium are trademarks of the Intel Corporation. DOS and Windows are trademarks of Microsoft Corporation. All other trademarks acknowledged. Prices, configuration and availability subject to change without notice. Prices and money-back guarantee do not include shipping. Shipping charges are calculated according to weight and distance. Appropriate sales tax will be added. NCR Corporation is not responsible for errors in typography or photography. ©1993 NCR Corporation.

Are You Ready for Mass Market PCs?

Attention, shoppers: Phones, TVs, VCRs, and computers are on aisle 4, behind bedding. Look for the red-tag specials. By Joe Abernathy

First it was the computer superstore. Then came office-supply depots and home-electronics stores. Now even Wal-Mart and Target are getting into the act. Never before have consumers had so many opportunities to save money—or spend money on the wrong product.

Almost every major PC company is courting mass-market retailers, once the almost exclusive domain of Packard Bell,

DAVID PETERS

IBM's PS/1 line, and a motley array of third-tier clones. Dell, Compaq, IBM, Apple Computer, and AST have all signed contracts to sell their systems through these stores. You'll now find computers on the shelves next to stereos, phones, and TVs at membership clubs, home-electronics stores, office supply warehouses, discounters, and mass-market retailers.

"There have been more changes in how computer products are bought and sold in the past 18 months than in the first 12 years of the PC industry," says Bruce Frederickson, president of Channel Tactics. The Gold River, California, company advises some of the biggest PC companies on how they can survive and succeed in this new marketplace.

It's easy to see what's driving the shift. The so-called mass market represented $3.12 billion in sales for PC companies in 1992, according to Dataquest, a market research firm in San Jose, California. The market is growing so quickly, in fact, that Compaq, whose PCs weren't sold through mass retailers until June of last year, expected mass-market sales to account for 25 percent of 1993 revenues.

No Frills, No Fuss

Buying a computer at Circuit City or Wal-Mart is not the same, however, as buying from a traditional computer store or from a computer superstore.

The so-called mass merchants promise out-of-the-box solutions, complete with preloaded software and an easy-to-understand interface that takes the mystery out of Windows. No more hard sells or technobabble from a condescending salesperson. And no more driving across town to a *computer* store. Now you can shop for your PC at the same place you go to buy your fridge, stereo, or paper towels and cereal.

That's the promise. But buying a PC through a mass merchant isn't without problems. Salespeople—when you can find them—are usually poorly trained, which can lead to inappropriate recommendations. And many of the available models are older units, without the latest technology.

Buyers and analysts who follow the retail market say price is the most important factor in determining where people buy computers. "I shopped around for the best price on the system I wanted," says Larry Johnson, a corrections officer in Canon City, Colorado. Johnson finally found the best deal on his Packard Bell PackMate 20 at Pace Electronics.

A survey of 1200 shoppers conducted last year by Merrin Information Services of Palo Alto, California, confirmed that price was the number one reason PC buyers gave for shopping at superstores, home-electronics stores, and office-supply stores. Though discount retailers, such as Wal-Mart, and membership clubs weren't included in the survey, analyst Laura Curran believes the same point holds true with these segments.

No more technobabble from a condescending salesperson. And no more driving across town to a computer store. Now you can shop for a PC where you buy your fridge, stereo, or paper towels.

You're on Your Own

Low prices and shopping convenience sometimes come at the expense of service, which is notably absent at most mass merchandisers. PC companies acknowledge that buyers are often on their own when they walk into a mass retailer to buy a PC, and they have devised different strategies to help computer buyers make the right choice.

Inviting and informative shelf displays promote the computers' many features (usually with tear-off specification sheets). Innovative packaging (complete with preinstalled software and splashy promotions) targets home and small-business users. Some PC makers have also designed innovative self-running demos that walk users through a machine's features.

These additions are certainly a step in the right direction, but in many stores the machines are turned off or display only a DOS prompt or a cryptic message requesting a password. Hardly the friendly welcome to which vendors aspire.

And some of the displays are misleading. Leading Edge, for instance, includes brochures promoting the "WinPro 486—Now you can afford a computer that does Windows." But it just barely does Windows: It's a 25-MHz 486SLC machine with no math coprocessor, 2MB of RAM, and a 107MB hard drive. It "supports resolutions up to 1024 by 768," according to the literature, but nowhere in the friendly display does it say you'll have to add video memory before these resolutions are supported.

IBM is guilty of the same thing. Advertising "power at a price you can afford," the display for the PS/1 Essential, model 2133-W45, seems to proclaim that finally, here is the business-class powerhouse you've dreamed of. But after reading the specs, you'll find the same relatively low-level system: a 486SX-25 with 2MB of RAM and a 129MB hard disk.

These products will likely satisfy many first-time buyers. But as users become more proficient and demand more from their systems, some will inevitably find these solutions inadequate. The result? Disillusioned and dissatisfied customers who have plunked down more than $1000 only to find they've outgrown their systems.

More Power

Apple Computer, whose Performa line typically claims one-quarter of the shelf space in mass merchants, confirms that customers have been asking for machines with more power. "People want more performance and more software," says Apple spokeswoman Gilda Raczkowski. New Performa models launched in October 1993 contained from $800 to $1500 in bundled software, along with hotter hardware configurations that more closely resemble Apple's high-end products.

Packard Bell, which has been in the mass market longer than anyone, also claims to have learned a lesson about underpowered machines. With shipments of 624,000 computers in 1992, Packard Bell now offers more than 100 models.

"We were the first mass marketer to do local bus video," says Mal Ransom, vice president of marketing for Packard Bell. "Another good example is multimedia; we did it in 1992, whereas our competitors are just coming out with it now. We are very involved in bringing out the latest technology as soon as possible.

It's Just a Computer

Vendors claim computers are so easy anyone can use them. Are they? We located a 'digital idiot' and asked him to try out the new Compaq Presario. Here's what he found.

By Daniel Pinkwater

A brand-new computer! Oh joy! New things to learn. New, bewildering instructions to follow. Ordinarily, I'd rather be shot.

Ever since I discovered that you can buy preformatted disks, I've had no need to venture out of my kiddie word processor into the hostile darkness of DOS. I've always known there was more up-to-date stuff to be had, but I still remember how much time it took to make the step from typewriter to computer, and I don't want to suffer anything similar.

So it was with trembling fingers that I clawed open the carton containing a brand-new Compaq Presario 425 (having been carefully chosen for this assignment as the nation's most perfect, or nearly perfect, digital idiot). If I could set this baby up and learn to work it, then lower animals—and maybe fish—could do it, too.

The machine was a beauty. Nice keyboard. Big screen—in color yet! And true to its name, it was compact, not much bigger than the monitor alone. Everything about it bespoke quality and thoughtful design. Hot dog! I was excited.

The setup went without a hitch. A four-page illustrated brochure called "Get started with your computer in eight easy steps!" showed where to plug everything in. I pressed the On button (Step 7).

The only exciting part was Step 8, where you pick a language from among all known human tongues. A not-that-prominent information bar reads: "Language selection is final. All other languages are removed." Miss that or hit a wrong key, and you may get: *Sprachenauswahl ist blebend. Alle andered Sprachen werden bei der Konfiguration gelosht.* Gelosht! I suppose, if you see that prompt, you've got no choice but to start looking around for a guy named Klaus to sell the thing to.

I got through the language choice okay. I chose English. It was a chicken choice because I already know that language, but the purpose of the exercise was to see how easy or difficult it would be for someone like me to get into this nifty state-of-the-art machine, coming as I do from the daily routine of an antediluvian PC, DOS 3.2 (not that I ever use it, mind you), and PFS:Write.

While the machine was loading programs and teaching itself English, I looked everywhere for the comic-book–style manual, maybe even with pictures of a friendly dog who would guide me through the mysteries of Windows. This book was not to be found. An oversight?

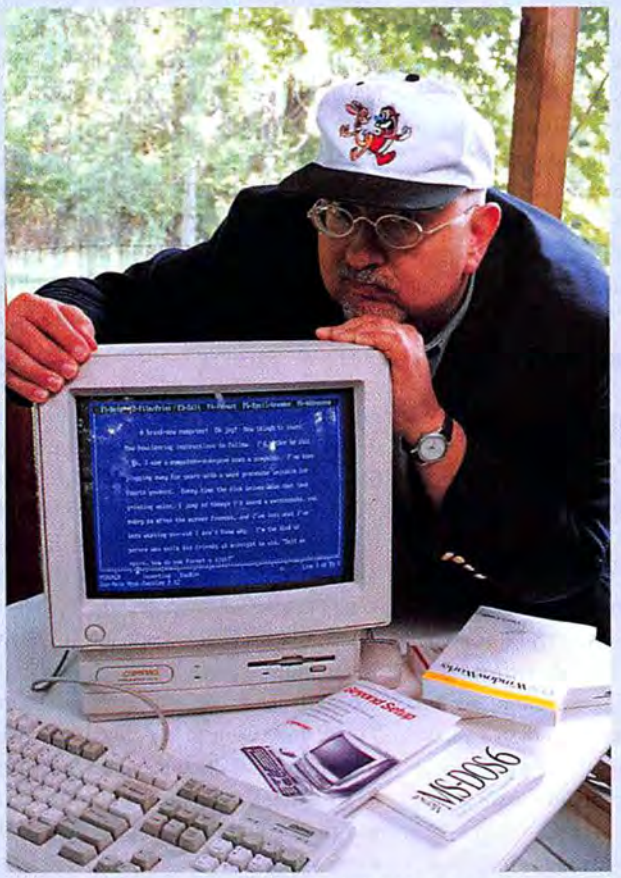
I decided not to read any of the manuals, aside from the eight-step brochure. The machine had to do all the indoctrination and teaching, or else what was the big deal? All computers come with volumes of hard-to-read manuals.

After an hour of hunt and peck, I finally blundered my way into an on-screen tutorial, and it was inadequate. Mostly I found a lot of perplexing advice about things like installing passwords. The tutorial assumed I knew something about the various features and programs on board, which I didn't and still don't.

Years ago, I worked with the first available Macintosh. It was slow and feeble and friendly. It came with an audiocassette of male and female voices talking through the process of learning the machine. They assumed I knew nothing and had never touched a computer.

Compaq, on the other hand, doesn't make this assumption. In fact, the only difference between buying the Presario and going to a computer shop where the technician loads everything is that the Presario installs everything anybody could ever need all by itself the first time you press the button. After that, it's peel the shrink-wrap off the manuals and settle down to a couple of weeks reading and learning. I'd love to do that, but who has the time?

I wound up buying the machine. It has a nice keyboard and a terrific screen, plus it's a lot faster than my old machine. With some help from a friend, I altered the AUTOEXEC.BAT file so, when I switch it on, it bypasses Windows and goes straight to my very own word processor. Maybe some rainy afternoon when I feel like avoiding work, I'll break out the manuals and find out what this little wonder can do.



KATHY McLAUGHLIN

DANIEL PINKWATER HAS WRITTEN 50 books for children and several popular books for adults. He is also a regular commentator on National Public Radio's "All Things Considered."

"Our buyer is somebody who walks into a warehouse club. But he doesn't want last year's technology," says Ransom. "At a mass merchandiser, the computer is presented as a complete offering, not as a mix-and-match situation."

PC World found, however, that it's still easy to bring home dated technology bearing Packard Bell's logo. In the mass-merchant stores we visited, many machines were clunky 386s. And even on the 486 machines, compromise was nearly inevitable. CD ROM drives, for instance, were 2-year-old, slow models, whereas new dual- and triple-speed drives rule the computer superstores. The computer sound available in the mass merchandisers was typically an 8-bit SoundBlaster—even though 16-bit is the growing standard—with dime-store speakers.

As Easy As...

One area of Packard Bell expertise may help balance the equation, however. After defining the mass market for computers in 1987, the firm pioneered a number of approaches to ensure consumers had a pleasant experience, which is a key consideration for first-timers.

When the Presario was released, Compaq was still ironing out the wrinkles in its Welcome Center, but Packard Bell systems already contained a custom Navigator front end that introduced users to their new computer. While Apple unveiled a box insert to walk new owners through setup, Packard Bell systems already contain a box-top sheet with the same information.

"Ease of use, plug and play, [these] are buzzwords, but they are things that we have done for a long time," says Ransom of Packard Bell.

Dell Computer in Austin, Texas, brings the customer and the company together before the sale is made. With its before-and-after-the-sale 800 number, Dell wants to make sure people buy the right computer to begin with, rather than fix a problem later. Dell also makes it harder to buy the wrong machine: The low-cost Dells sold in Sam's Club are the same machines sold to sophisticated mail-order buyers, with fewer frills and lower prices. Because of this, you can add the best multimedia package later, rather than finding yourself with a machine that doesn't meet your needs in six months.

Yes, but Are They any Easier?

There is some concern whether machines such as the Presario and Apple's Performa family may promise more to beginners than they can deliver. Although the Presario is one of the most accessible Windows machines available, a novice who reviewed the machine for us was lost once he landed in the Welcome Center, the gateway to Windows. (See the sidebar, "It's Just a Computer.")

"[We] need to educate the consumer and answer the question, 'Now that it is up and running, what should I do with it?'" says Compaq's Gian Carlo Bisone, vice president of marketing for Compaq North America. He adds that Compaq's surveys indicate that most potential Presario buyers have some computer experience.

"Our overall strategy is to push the envelope on ease of use," says Bisone. "We are testing internally what the best metaphor is to welcome people into a home computer," he adds, noting that ease of use and reliability are primary areas of focus and change.

"This market has three major attributes, and the first is a certain uneasiness with technology," Bisone notes. "So our name brand—Compaq—is very important. Second, support is a key ingredient; so the three-year warranty and seven-days-a-week, 24-hours-a-day support [policy] are very important. The third element is ease of use and setup."

Compaq offers an industry-leading three-year, on-site warranty. By calling a toll-free number, customers can get support for any aspect of the product, including the bundled software. Dell lacks the three-year warranty, but all their customers receive the same Dell phone support—regardless of where they buy their machines (a welcome change from the company's earlier policy of offering less comprehensive telephone support packages to customers who bought their computers through mass-market retailers). IBM also offers toll-free product support, which is becoming a welcome standard in the mass market.

Educating the Retailers

One problem 800 numbers can't solve, however, is people buying a computer that doesn't meet their needs. An educated sales force in retail stores would help.

Larry A. Berk, divisional merchandise director of hardware for Computer City, says manufacturers need to work much harder to understand the business. "The industry generally ought to be pretty embarrassed by how unsophisticated they are in selling in this environment," he says.

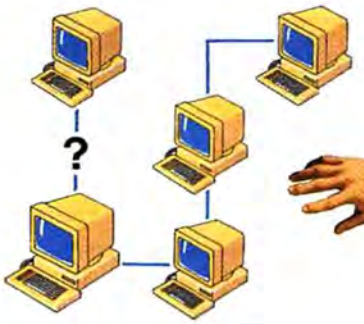
The need to do more is not lost on the industry. In fact, this void has sparked another new industry: Specialists called temp reps visit stores and educate the salespeople in how to sell computers. Alan E. Hall, president of Technology Advancement Corporation in Ogden, Utah, pioneered the practice, working with nearly every major hardware and software vendor.

In the past few months, Hall says, more and more of his company's time has been spent in the mass merchandisers. "Traditionally the temp rep has focused on the MicroAge-type stores, mom-and-pop shops, and chains such as Egghead, and we still do that," says Hall, whose company demonstrates and trains salespeople on everything from spreadsheets to PS/1s. "But now the general merchants like Sears and Wal-Mart are handling computer products, and we're going in there and beginning to educate some of those salespeople," he says.

According to Hall, salespeople in the mass merchandisers have little technical expertise and gladly welcome the assistance. "They don't want to look like idiots [when customers ask them questions,]" says Hall.

"In a regular old computer store, the salespeople know what a hard drive is. But when you go into Sears, you need to talk about what a mouse is. You need to tell them about the difference in monitors, the difference in RAM. What in the world *is* RAM?" he adds.

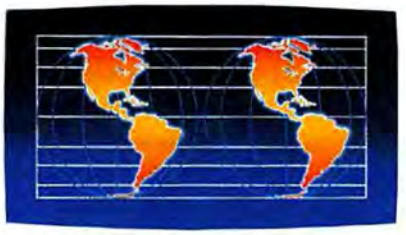
"In a regular old computer store, the salespeople know what a hard drive is. But when you go into Sears, you need to talk about what a mouse is. You need to tell them about the difference in monitors."



Find out why your PC won't talk to your LAN. And what you can do about it.

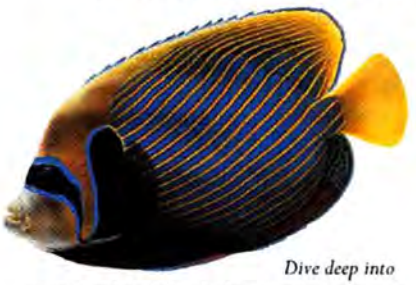
Discover a good place to dive, or get the lowdown on buoyancy compensators.

Copy down a truly delicious tofu recipe. (Really!)



Talk to twice as many people about parallel universes.

Finally, a computer information service you can't outgrow. No matter how hard you try.



Dive deep into aquarium lore. Like whether a canister or protein filter is better for a 110-gallon saltwater tank.

Shop. But don't drop. Need a 100% cotton pinpoint oxford shirt with button-down collar? In ecru? Try on our Electronic Mall®.

Find out just what the heck a zither is.

No matter what you're into, you can get more out of CompuServe.

You can range widely over a wide list of services that will help you, entertain you, teach you, and challenge you. Or delve deeply into your favorite topics, learning (or even teaching) more, meeting experts, and making friends with people who share your interests.

CompuServe lets you do everything from keeping in touch with our communication services, to getting advice from online hardware and software experts. It's the one computer information service you won't outgrow.

But you will have a good time trying.

For a low one-time membership fee and $8.95 a month, you can use our most popular services as often as you like: news, sports, weather, shopping, reference materials, our electronic mail service of up to 60 messages a month, and more. Plus there's a whole universe of other, extended options available at nominal additional charges. Your first month on CompuServe will be free, and we'll give you a $25 usage credit to explore our extended services.

To buy a CompuServe Membership Kit, see your computer dealer. For more information, or to order direct, call 800 848-8199 (614 529-1349 for international inquiries).

CompuServe®

The information service you won't outgrow.™

Circle 33 on reader service card

Tips for Buying in the Mass Market

Buying a computer couldn't be easier. But don't let the convenience lure you into making an impulse purchase. You'll need more than just a credit card to get the right PC.

Here's our advice:

• Assess your needs. What will you use the computer for? Will it be an all-purpose machine for home or your primary business computer? The answers to these questions will determine how much PC you need.

• Determine your budget. Know how much you're able to spend *before* you start visiting stores.

• Bone up on the literature. Check out the latest reviews in *PC World*. Read the ads, too—many companies offer 800 numbers for buying advice. Call them. It's their dime.

• Ask around. Talk to friends, associates, or even members of the local PC user group—anyone who will share their experiences. Ask about specific PC companies and stores.

• Know your options. How long is the warranty? What are the tech support hours? How easy is it to add memory, a larger hard disk, or a CD ROM drive?

• Narrow your choices. Settle on two or three systems that meet your needs, then start shopping around for the lowest price.

• Scan your newspaper. Check ads for computer specials. Warehouse clubs don't advertise, but most other retail players do.

• Try before you buy. Don't just load the boxes into your cart. Check out the display first. Do you like the keyboard? What about the tutorial? Does the vendor include disks and manuals with all the preloaded software? If you can't get the display computer to work, find someone who can. If the display literature doesn't answer all your questions, ask the person in the red vest.

• Unpack the boxes. Don't wait two weeks before setting up your new computer. Test all the components—modem, fax board, et al.—to make sure everything's okay. If anything doesn't work, call the store right away. You should be able to get a new system, rather than wait for a replacement part.

• Protect your investment. Make sure the PC maker *and* the store have money-back guarantees. It's the ultimate protection.

—Roberta Furger and Christina Wood

Hall's training package includes a product demonstration, information about warranty and support services, and pricing details—"everything a salesperson needs to know to sell this product," he says. "Then we take them through a little bit of sales training: Here's the profile of the customer for this product. Depending on different models, particularly on a CPU, we try to help salespeople identify the needs of the customer and try to match them with the units. It's a mistake to sell the wrong piece of equipment to someone. If the customer isn't happy, they're gonna bring it back."

Witness the experience of Packard Bell: "In 1991, Packard Bell took back $107 million worth of product, and 98 percent was not defective. About 68 percent of these machines were returned because the customer wasn't happy, didn't like the way it looked," says Lee Levitt, distribution channels analyst for International Data Corporation in Framingham, Massachusetts.

Packard Bell claims that returns have been reduced but refused to provide numbers to back up the claim. Ransom says that the high return rate is a symptom of the unique arena in which Packard Bell does business.

"You're talking to the only company in the industry that focuses only on retail channels," he says. "If you were able to break out any of our competitors' returns relative to the same channel, the returns would be the same."

Ransom says many returns are based on buyer's remorse, and that less than 2 percent of products returned are defective.

Hit the Books

Despite the potential for buyer's remorse, most of the recent buyers interviewed for this article were satisfied with the computer they chose—a testament, perhaps, to the amount of research they did before buying.

"You need to do your homework no matter where you buy," says Allen Childress, who bought his home computer at Sam's Club in Scottsville, Texas. But research becomes even more critical when you're buying for the first time—and at a self-help–style store.

Childress says mass merchandisers actually make the process easier by *limiting* your selection—a notion that most veterans would find sacrilegious. "The choices aren't infinite, like they are in a computer store," says Childress. "They have about six different computers—from a low-end system up to a 486-66, and prices range from $1000 to $3500. You figure out what you need and what you can afford, and somewhere in between you'll find the perfect computer."

It's not a bad approach for many first-time buyers and more experienced users who like the convenience of shopping at a mass merchant. It's also not unlike the way most consumers buy their home appliances.

Just like buying a TV or VCR, there is nothing like that feeling of picking out your computer, putting it in your cart, and taking it home.

Joe Abernathy is a senior editor at PC World. *Senior Editor Roberta Furger and Assistant Editor Christina Wood contributed to this article. They can be reached on PC World Online (see page 12 for contact information).*

DAVID PETERS

THE SECRET TO OUR SUCCESS IS REALLY QUITE SIMPLE.

AUSTIN
AN IPC COMPANY

THE LESS WE
THE MORE YOU

Genesis 486SX-33

- 4 MB RAM
- 212 MB Hard Drive
- 512 KB Local Bus Windows™ Accelerator
- 14" SVGA Monitor
- 5 16-bit ISA Slots
- Microsoft® Works

$1,299 Lease $49/month*

Genesis 486DX2-50

- 4 MB RAM
- 128 KB L2 Cache
- 340 MB Hard Drive
- 1 MB Local Bus Windows Accelerator
- 15" NI SVGA Monitor
- 5 16-bit ISA Slots

$1,799 Lease $67/month*

If you'd prefer not to shell out megabucks for your megabytes, you've come to the right page.

Austin specializes in computer systems that are expansive, not expensive. High performance, not high priced.

In other words, value is the name of our game. Value that starts with shrewd pricing, encompasses the hottest new technology, and extends to years of reliable service. Here's what we mean.

All systems, including those with on-the-edge 486 and Pentium™ processors, are flexible, expandable, and can be customized to your specifications. All are available with state-of-the-art CD-ROM drives or full

PC MAGAZINE EDITORS' CHOICE

PC MAGAZINE SERVICE & RELIABILITY READERS' CHOICE

MICROSOFT WINDOWS READY-TO-RUN

intel inside

yes NetWare Tested and Approved

energy EPA POLLUTION PREVENTER

CHARGE YOU, CAN SPEND.

Premier 486DX2-66

- 8 MB RAM
- 128 KB L2 Cache
- 425 MB Hard Drive
- 1280 x 1024, 2 MB VL-Bus Windows Accelerator
- 15" Digital SVGA Monitor
- 5 ISA & 2 ISA/VL-Bus Slots

$2,499 Lease $93/month*

Premier P5-60

- 60 MHz Pentium™ Processor
- 8 MB RAM, 256 KB L2 Cache
- 425 MB Hard Drive
- Sony Double-spin CD-ROM
- 1280 x 1024, 2 MB PCI Bus Windows Accelerator
- 15" Digital SVGA Monitor
- 4 ISA, 2 PCI and 1 ISA/PCI Slot

$3,149 Lease $110/month*

MediaMagic™ Sound Systems. And all are equipped with an extendable two-year limited warranty on parts and labor; free one-year on-site service; and lifetime toll-free technical support. Plus a reputation that has attracted a wall full of PC Magazine and PC World awards.

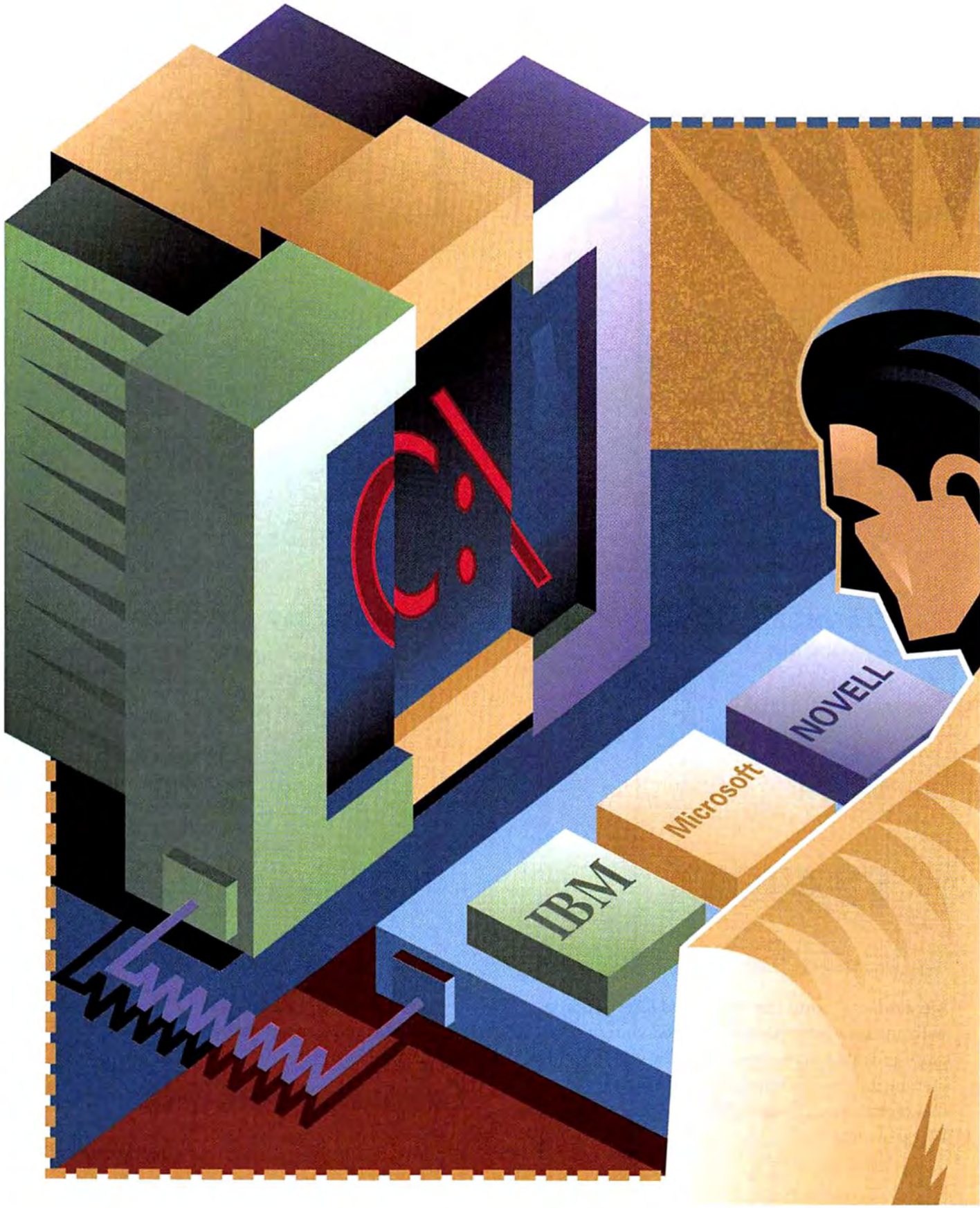
Austin Computer Systems. You'll come back for more. Because you can come back for less. Call us toll-free today.

Call Direct 1-800-331-1501

Austin Computer Systems • An IPC Company • 10300 Metric Blvd., Austin, TX 78758
FAX: 512-454-1357 • Overseas: 512-339-3500 • Canada: 1-800-338-1565

AUSTIN
AN IPC COMPANY

©1994 Austin Computer Systems. All rights reserved. MediaMagic is a trademark of IPC Corporation LTD. The Intel Inside logo is a registered trademark and Pentium is a trademark of Intel Corporation. Microsoft is a registered trademark and Windows and the Windows logo are trademarks of Microsoft Corp. All other company names and products are trademarks or registered trademarks of their respective owners. Prices and specifications are subject to change without notice. *Lease term reflects 36-month contract.


C:\
NOVELL
Microsoft
IBM

SI HUYNH

DOS vs. DOS

There are now three operating systems calling themselves DOS, and each has had a recent upgrade. But which is the best for you?

By Van Wolverton

Life was simpler ten years ago. You bought DOS from the company that made your PC: IBM. Sure, IBM was paying Microsoft for the right to sell that DOS to you, but it wasn't something you had to think about.

Life isn't nearly so simple today. Everybody makes PCs, and three companies sell their versions of DOS. There is MS-DOS 6.2, Microsoft's quick upgrade of the oft-criticized MS-DOS 6.0; PC-DOS 6.1 from IBM; and Novell DOS 7

(an upgrade of Digital Research's DR DOS) from network big shot Novell.

To see how these operating systems measure up, we took a good hard look at all three. Unfortunately, only IBM's PC-DOS 6.1 was available on store shelves when we prepared this article. Our impressions of Microsoft's and Novell's products are based on prerelease code, making it impossible to make definitive judgments about performance or reliability. Look for a sequel to this article when we have shrink-wrap versions of everything.

How should you evaluate these DOSes? Not by cost. Despite a wide range of list prices, all three are expected to sell somewhere in the $50-to-$60 range. There's one exception: If you already have MS-DOS 6.0, you can upgrade with Microsoft's 6.0 to 6.2 StepUp floppy, which will be available in stores for only $9.95 and on bulletin boards and online services—including PC World Online—for the cost of a download.

If you can't shop by price, how do you decide? To hear Microsoft tell it, compatibility with existing applications and past versions of MS-DOS is the *only* issue. But features, utilities, performance, and usability also deserve attention.

The Contestants

Any look at DOS must begin with MS-DOS, the standard. Microsoft released a major upgrade, 6.0, early last year, and quick on its heels came horror stories of lost files, locked systems, and other disasters. Most of these stories involved the disk compression utility DoubleSpace. No matter that it proved well-nigh impossible to re-create the problems, Microsoft had to face the fact it had a public relations crisis on its hands.

Hence version 6.2 of MS-DOS, which Microsoft is touting as safer than 6.0 (without actually admitting 6.0 had problems). The most notable addition is ScanDisk, a disk diagnostic and repair utility similar to those found in Norton Utilities and PC Tools that goes way beyond what the old CHKDSK program could handle. ScanDisk can repair cross-linked files, test the integrity of every sector on your disk, and repair or lock out the bad sectors. According to Microsoft, ScanDisk works equally well on compressed and uncompressed drives. There's also DoubleGuard, which verifies data in memory before writing to disk, and a diagnostic routine in HIMEM.SYS that extensively tests memory when you boot your system. Other changes to MS-DOS include the ability to single-step through AUTOEXEC.BAT and bypass DoubleSpace at start-up. All in all, it's not a major upgrade, but it may help Microsoft restore the faith of scared customers.

IBM and Novell have a more difficult problem to solve: Their products need to

Another View: Tweedledee and TweedleDOS

The closer you look at MS-DOS 6.2, PC-DOS 6.1, and Novell DOS 7, the harder it is to select one. Each has advantages that will attract some users, and shortcomings that will send others scurrying for cover. Like Van Wolverton, I dubbed Novell DOS 7 the best choice for power users willing to put up with (and work around) some minor compatibility problems. But if you're a novice, I'd recommend IBM's PC-DOS 6.1. And if you believe in taking no chances, MS-DOS 6.2 is your best bet.

MS-DOS 6.2 is little more than a public relations upgrade, intended primarily to allay user fears about data integrity. The new DoubleGuard safety features are sure to inspire some confidence, and SmartDrive's new default settings may eliminate some of the data-loss problems that arose when users turned their PCs off too soon. The ScanDisk program, however, doesn't do anything like the extensive testing you get from a professional surface tester like Gibson Research's SpinRite. Overall, these free utilities still aren't the greatest, and you may want to consider some of the better third-party alternatives.

For the most part, though, MS-DOS 6.2 is the same as 6.0. While it makes sense to upgrade to get the handful of new features, there's no urgent need to do so unless you've been experiencing problems. As the de facto standard, Microsoft's MS-DOS is the operating system under which all application software is tested and is therefore, by definition, likely to remain free of compatibility problems. I agree with Van: If compatibility is your first and foremost concern, MS-DOS is your safest choice.

Novell DOS 7, by contrast, has many outstanding capabilities, but it is the DOS most likely to have compatibility problems. Since we haven't yet seen final code, it's impossible to say if Novell DOS will have problems running the variety of DOS and Windows programs out there. Since it doesn't contain the same core code as MS-DOS and PC-DOS, the potential is surely there.

Intentional Flaws

Ironically, many incompatibilities I found in Novell DOS turned out to be intentional. For instance, while MS-DOS's MOVE command can be used to rename a directory, you must use a unique RENDIR command in Novell DOS. (As Van noted, Novell also fails to support Microsoft's multiple configuration scheme and new options in MS-DOS's DIR command.) Novell apparently thinks that since its methods are better, it doesn't need to offer compatibility with Microsoft. That's a risky stance, since some users will always demand 100 percent compatibility at any cost.

Luckily for Novell, its DOS is compelling enough to tempt many users—especially power users—to risk a few minor compatibility problems. Built-in networking, guaranteed NetWare compatibility, a special version of Stacker (which I consider the best disk-compression utility), multitasking that doesn't require the slow, resource-hogging Windows environment, protected-mode TSR support, a protected-mode CD ROM driver, and integrated security are likely to be big draws, especially at large corporate sites. And the online documentation, which includes a pleasant GUI interface, is the first totally complete online manual to ship with any DOS.

IBM PC-DOS 6.1 falls some-

be better than Microsoft's if they expect to gain a serious toehold, since most users will routinely buy MS-DOS without thinking (or get it bundled with their computers). Not surprisingly, the companies have approached this challenge in different ways.

IBM's PC-DOS 6.1 is really MS-DOS 6.0 with some support for pen computing and PCMCIA cards, and a set of third-party utilities that, unlike Microsoft's, aren't crippled or two years out of date. PC-DOS 6.1 was completed before a shared technology agreement between IBM and Microsoft expired in late September, so most of the base code is identical. It looks and feels like MS-DOS, just as all the previous releases of MS-DOS and PC-DOS have been nearly identical. But while MS-DOS comes with watered-down versions of programs like Central Point's AntiVirus and Undelete, and Symantec's Speed Disk, PC-DOS comes with the real McCoys.

Novell, on the other hand, offers major changes at the core. Sure, you'll get the usual collection of utilities that the other two operating systems offer, but how'd you like to have *real* multitasking? And are you considering a network? Here's your chance to get the software for free; just buy some network interface cards and cable, then use the Novell DOS Setup program to get connected. No extra software is needed, even if you want to hook up to a NetWare LAN.

But for IBM and Novell, being better—even much better—isn't good enough. They also must prove they're just as good—in other words, compatible.

Working With Everything

Compatibility comes in several flavors: There's compatibility with the hardware, with the commands that make up the DOSes' minimalist user interface, and, especially important for most users, with the programs—specifically Windows and major applications—that run on top of DOS. This is the hardest type of compatibility to achieve; even Microsoft has to work at it with thousands of beta sites testing each upgrade. If a DOS doesn't achieve absolute compatibility at this level, someday a program will fail, perhaps damaging data.

Unfortunately, we can't use prerelease software to judge software compatibility. Any problems we encounter may be fixed by the time the disks ship, and other incompatibilities may crop up. One statement we can make: Since Novell DOS doesn't use Microsoft's code, it faces the greatest challenge in proving itself compatible.

Then there's hardware compatibility. With 32-bit operating systems such as Windows NT and OS/2, this is a real issue. But with plain old DOS, it's not something to worry about. Everyone manufacturing DOS-compatible computers these days is taking pains to make their hardware fit the standard (the exception is IBM with its Micro Channel machines, and even they vary little in the software). Compatibility with peripheral hardware, such as CD ROM drives and video cards, comes down to compatibility with drivers—in other words, software.

Finally, there's command compatibility. If you're accustomed to using DOS at the prompt or depend on batch files to automate your work, you need a DOS that's compatible with the commands from your last version. That's a pretty simple kind of compatibility to achieve, and one we can judge from our early copies. Basically, incompatibilities at this level are a matter of choice—someone has a better idea of how a command should be used—rather than an error or inability to test all the possible circumstances.

So how command-compatible are the new DOSes? Even Microsoft doesn't get a clean bill of health. In mov-

where between the other two in terms of both features and compatibility. Because it's based on the same code as MS-DOS, it should be compatible with virtually all applications. But it lacks some utilities, such as Qbasic, and MS-DOS's Edit is replaced by IBM's "E" editor, which doesn't offer enough additional features to make the relearning process worthwhile. However, the third-party utilities bundled with PC-DOS are first-rate. They are complete third-party programs rather than the crippled versions that come with MS-DOS.

So why is PC-DOS the best option for novices? Documentation, for one thing. Along with a full set of conventional books, the package has Que's *Everyday DOS*, a good beginner's text that costs $16.95 if bought separately. You can buy MS-DOS 6.2 with special copies of Dan Gookin's *DOS for Dummies*, but you can't get MS-DOS with Gookin's book *and* complete documentation. (In fact, you can't buy MS-DOS with complete documentation.)

What's really amazing is IBM's support policy. Voice support isn't just free, it's toll-free—an incredible bargain in an age when most companies nickel-and-dime you to death when you're ill-prepared to argue. To get support for PC-DOS, you call an 800 number; if a tech can't help you right away, you'll get a call back. This by itself might be a compelling reason to pick PC-DOS. If you call more than twice, you might save more than the cost of the product on support.

Compare that to Microsoft's support policy, which provides users with only 90 days of free technical support. After that, you will have to pay through the nose—calling a $2-a-minute 900 number, charging a $25 per-incident fee to a credit card, or paying $195 annually for a support subscription.

Voice support for Novell DOS is worse. The first 30 days are free, but after that you must call a 900 number ($2.95 for the first minute, plus $1.95 thereafter) or pay a $25 flat fee per incident.

Which product would I choose?

But what's really amazing is IBM's support policy. Voice support isn't just free, it's toll-free. This by itself might be a compelling enough reason to pick PC-DOS.

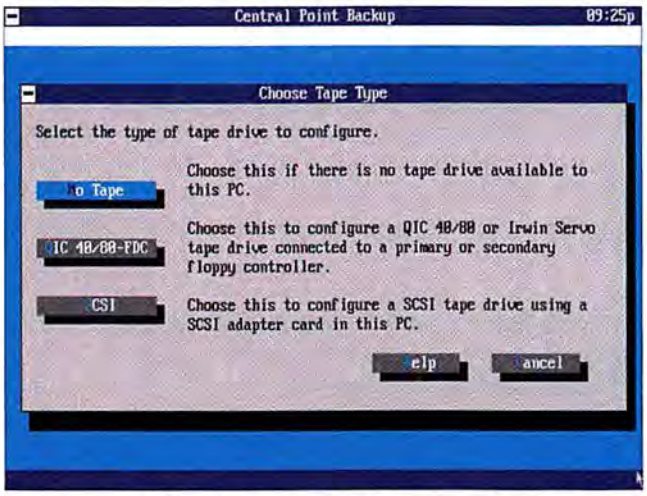
As a power user and a subscriber to CompuServe (where it's easy to get 24-hour advice), I'd go for Novell DOS, with its integrated networking, bundled Stacker, and built-in DOS multitasker.

But not everyone matches my profile. If you're a novice or expect your organization to make a large number of support calls, IBM is probably the best bargain. And if you can't risk incompatibilities, choose MS-DOS.

—Brett Glass

ing from MS-DOS 5.0 to 6.0, Microsoft dropped a dozen or so commands; in version 6.2, for example, Microsoft moved the Shell to the supplemental disk, effectively killing the Shell's opportunity to be a widely used feature. Users who like these abandoned tools must either make sure not to delete them when they upgrade, or order the supplemental disk from Microsoft.

Microsoft claims it dropped the Shell from the 6.2 distribution disks because no one used it, but either Microsoft's research was inadequate, or the company's being somewhat disingenuous. For millions of DOS diehards who hadn't yet embraced Windows, the Shell offered the easiest way to manage files and the *only* way to do task switching. A case can be made that Microsoft is purging as many remnants of IBM's partnership in DOS development as it can: Many of the programs and files dropped from the last two versions of MS-DOS—such as the COMP command, the DOS Shell, and PRINTER.SYS—were written either by or at the behest of IBM.



IBM HAS THE BEST BACKUP: PC-DOS 6.1's version of Central Point Backup is the most useful backup utility included with a DOS.

Not surprisingly, all these tools are still in PC-DOS. Because the basic code is essentially the same, PC-DOS is quite compatible with MS-DOS. If you use MS-DOS 5.0 or higher, PC-DOS 6.1 will feel like home.

PC-DOS's disk compression hasn't yet met the test of widespread marketplace use, since IBM just started shipping its bundled version of AddStor's SuperStor in late October. It remains to be seen whether it will face the same sort of negative reception that DoubleSpace encountered. But at the command and program levels, PC-DOS's compression is probably as compatible as you can get.

But IBM's DOS lacks two programs that many MS-DOS users depend on: Edit and Qbasic. PC-DOS 6.1 has its own editor and another language interpreter, but if you're used to Microsoft's tools, you'll be in for some relearning.

Novell DOS 7, on the other hand, goes its own way in a few instances. The DIR command, for example, lacks many MS-DOS 6.0 enhancements, including those that let you list files by attribute, sort your list, and include subdirectories in your search. True, Novell DOS 7 comes with a separate program that offers this same functionality, but using it could involve a change of habit—and of batch files.

As with Microsoft's and IBM's DOSes, Novell DOS 7 lets you set up CONFIG.SYS and AUTOEXEC.BAT files to provide multiple boot configuration options. Unfortunately, the commands you use to define those options don't match Microsoft's and IBM's. You could argue that Novell's commands are more flexible than Microsoft's—for example, you can paint your own menu instead of accepting the bland default of MS-DOS. But if you're already a DOS 6.0 user, you could go insane rewriting AUTOEXEC.BAT and any other complex batch files you might have. Even if you weren't using MS-DOS 6.0, that incompatibility could mean trouble if you want to share batch files with others. Technically, Novell's method may be superior, but some decisions are better made by marketing than engineering.

Managing Your Memory

None of these operating systems breaks the 640K memory barrier, but at least we're getting closer to opening all 640K to applications. All three include memory management programs that place device drivers and other RAM-resident programs in upper memory (between 640K and 1MB); Novell DOS even allows RAM-resident programs to run in extended memory (above 1MB), where there's much more room to play. The catch is that the programs must be designed to run in extended memory via Novell DOS; for the foreseeable future, the only utilities so designed will be those that come in the box.

All around, the results are impressive. On the same PC, after we loaded the required system elements into conventional memory and all other programs higher, the three DOSes left 622K to 626K of RAM.

But numbers aren't the whole story. MS-DOS and PC-DOS both include an optimizer that determines how to make the best use of your memory; in most cases you need only type a command and wait while your system is restarted a few times. When the activity finishes, you've got new CONFIG.SYS and AUTOEXEC.BAT files that know which programs to load high and in what order. Using Novell DOS 7, you must do the job yourself.

The optimizers can't handle everything, however. I achieved the numbers above, for instance, by manually fiddling with all three DOSes; the optimizers did not give me as much free room as I could achieve on my own. One feature they can't cope with is multiple configuration options; if your CONFIG.SYS brings up a menu of configurations and executes different commands depending on your choice, the optimizers won't automatically give you the best use of memory all around (interestingly, several third-party memory managers have adapted themselves to DOS 6.0 to the point where they can handle multiple configurations). Similarly, if your AUTOEXEC.BAT file calls other batch files that load memory-resident programs—this could be a continuation of the multiple-configuration process—the optimizers won't examine and alter the commands in these, either.

What's more, PC-DOS's optimizer had a few problems. It refused to load the two largest resident programs for our LANtastic network—REDIR.EXE and SERVER.EXE—into upper memory. It wasn't that we couldn't load these programs high with PC-DOS 6.1; we accomplished that just fine, but only after we manually altered CONFIG.SYS.

So there are some situations that the memory optimizers in MS-DOS and PC-

DOS can't handle, but by and large they take the mystery (and tedium) out of making the most of your available memory.

The big noise about MS-DOS 6.0 was the set of utility programs included free, especially file compression (the previous version of Novell DOS, DR DOS 6, already had disk compression, but it took Microsoft's DoubleSpace to make people sit up and take notice). Now all three of the operating systems have the same basic set of utilities: disk compression, backup, undelete, antivirus, and disk defragmenting. To this brew MS-DOS 6.2 adds ScanDisk, its disk diagnostic and repair program.

Most of these utilities are licensed from other developers, principally Central Point Software, Symantec, and Fifth Generation Systems (recently acquired by Symantec).

Central Point Software may benefit from the DOS wars more than anyone. Symantec

Novell DOS on a Network

Of the three new DOSes, only DOS 7, from network market leader Novell, has built-in networking capabilities. This is big news for connected DOS users who hunger for network software that's integrated into the operating system.

And integrated it is. Novell DOS comes with both peer-to-peer and client/server capabilities. You can use it to set up a small departmental LAN, connect to a Novell NetWare server, or do both at the same time on the same machine. And thanks to the network-aware setup program, the challenging job of turning a DOS computer into a NetWare node becomes relatively simple with Novell DOS.

Easy Networking?

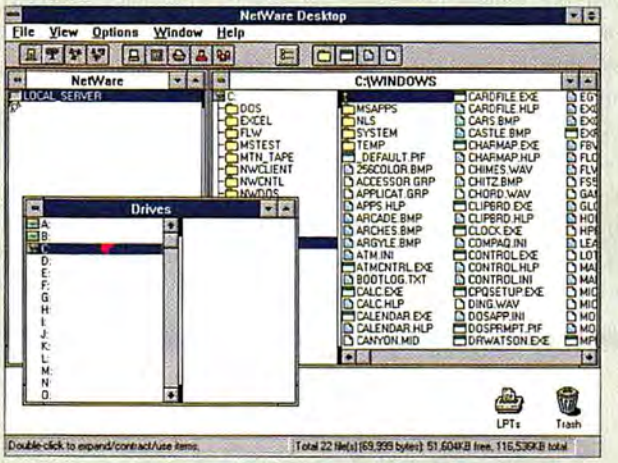
But can the average Joe or Josephine set up a network with Novell DOS without going crazy? To find out, I tossed aside the manual and attempted to configure a six-station Novell DOS LAN without resorting to the documentation. To my delight, I discovered I could install the network through Novell DOS's main setup menu, and that the process was quick and amazingly trouble-free. I did my experiments with a prerelease copy of Novell DOS; the shipping product may differ.

When you set up a network, the only information you need to provide is the model, I/O address, and the interrupt level of each machine's network interface card. The default settings for the major adapters are built into Novell DOS's installation program, so if you haven't fiddled with your board's jumpers, you should have no trouble. In contrast, Microsoft's Windows for Workgroups, which includes a peer-to-peer network, automatically tries to determine the identity and settings of your network adapter. This is convenient, but risky; Novell's more conservative approach is less likely to cause crashes or interfere with other peripherals.

As soon as I entered this information, the network drivers installed themselves with no further action on my part. Everything ran perfectly on an assortment of Artisoft AE-2 and AE-3 cards (which are enhanced Novell NE2000 clones) and Earth Computer Technology Earthnet 1E cards (inexpensive NE1000 clones). While I did no formal benchmarking, peer-to-peer performance seemed similar to that of LANtastic running on the same machines. And I had no trouble using a workstation to log onto a NetWare 3.11 server.

Novell DOS uses its advanced memory management capabilities to keep the network out of your way. Thanks to Novell's DOS Protected Mode Services (DPMS) feature, the peer-to-peer server software needn't reside in either conventional or upper memory, which are often crowded with programs trying to stay out of conventional memory, but in extended RAM, where there's bound to be plenty of room. And a number of the other network TSRs that come with Novell DOS are Virtual Load Modules (VLMs), which the operating system can swap in and out of conventional memory as they're needed.

Personal NetWare Desktop, a Windows-based configuration and administration utility whose intuitive drag-and-drop interface and extensive online help make routine network tasks a breeze. There's also an equivalent DOS-based utility and DOS- and Windows-based diagnostic programs. While I didn't perform extensive tests on all the network management features, I noted that Novell DOS included agents for the Simple Network Management Protocol (SNMP). This standard lets you manage your peer-to-peer network locally or remotely with nearly any network management software package. One glaring omission: an E-mail program. But any NetWare-compatible E-mail program should be able to work with Novell DOS.



EASY NETWORKING IN WINDOWS: Novell DOS 7 includes Windows tools that let you administer your LAN and establish access to network resources by pointing, clicking, dragging, and dropping.

All Novell DOS's networking features will also be available as a single separate product, called Personal NetWare, which eventually will replace the current NetWare Lite. Interestingly, both Personal NetWare and Novell DOS 7 list for $99.

To accommodate both large and small organizations, Novell DOS comes with everything you need for peer-to-peer networking among DOS machines, connecting to a NetWare server as a client, or doing both at the same time. Among these tools are the

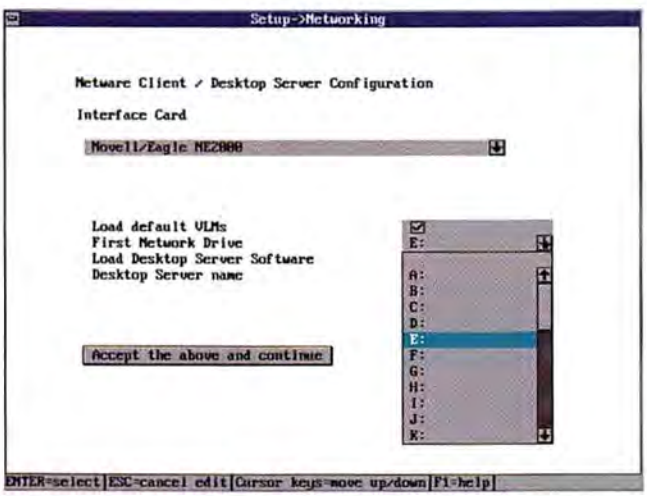
–B.G.

managed to sell its disk defragmenter to both IBM and Microsoft, but Central Point is represented by two utilities in MS-DOS 6.2 (Undelete and AntiVirus) and three in PC-DOS 6.1 (RAMBoost, Central Point Backup, and Undelete). Novell went to Fifth Generation Systems to get Fastback Express for its backup and antivirus utilities. None of these third-party companies is giving away the store; the software they licensed to Microsoft is either incomplete or out of date. IBM paid to get newer and more complete versions, but even its utilities are in many cases one level behind current versions on the market.

All the disk compression utilities use similar technology to compress and expand files as the operating system needs them. All three offer about the same performance, too, taking about the same amount of time to set up a compressed disk, achieving about the same compression ratio, and exacting the same performance penalty (negligible, in most cases). None of the programs came close to a 2-to-1 compression ratio, the figure most commonly used in promotional literature. None of the systems was noticeably faster than the others at compressing, although the entire process in MS-DOS 6.2 takes longer because of ScanDisk's more thorough check. For more information on disk compression, see "Is Compression Worth It?" in this issue.

It's worth noting that both Novell and IBM come with versions of established third-party compression programs, although Microsoft's product, DoubleSpace, quickly became the market leader when it was released with DOS 6.0. PC-DOS comes with AddStor's SuperStor, while Novell DOS has Stac Electronics' Stacker. These programs offer one major advantage over MS-DOS's DoubleSpace: They're more portable. They let you compress a floppy, copy a couple of megabytes of files onto it, and then read that floppy on a PC that does not have compression software.

The backup utilities are also similar. You start the program, it checks your system to see what sort of devices are attached, then runs through a trial backup to confirm how fast it can write to your backup drive. MS-DOS 6.2 and Novell DOS 7 let you back up only to a floppy disk or other device identified by a drive letter, such as a removable hard disk. PC-DOS 6.1, however, makes this task truly convenient by letting you back up to a tape drive, the preferred backup medium.



EASY CONNECTIONS: Novell DOS 7 includes peer-to-peer networking, a feature not available in either MS-DOS 6.2 or PC-DOS 6.1.

You undelete files much the same way with all three systems. Files can be recovered quickly if you have not written other files to the disk. The antivirus programs scan your files and build a database for comparison; after a first run that takes 10 to 15 minutes, subsequent checks take a minute or so. MS-DOS and PC-DOS use the same disk defragmenter from Symantec, but the MS-DOS version is limited to drivers no larger than about 250MB; Novell developed its own optimizer.

Doing Two Things At Once

Both IBM and Novell offer task switching, which allows you to keep more than one program up at a time. MS-DOS previously had this capability, but Microsoft's version 6.2 lacks the DOS Shell, where the feature resides. If you want task switching with MS-DOS 6.2, you'll have to either hang on

THE DOS SHELL, with its quick and simple file management and task switching, still lives in PC-DOS 6.1.

to the DOS Shell files when you upgrade from version 6.0 or order the supplemental floppy disk.

But task switching is a limited affair; programs in the background remain dormant until they're called to the front. Novell DOS 7 has gone beyond that to offer full multitasking, which allows programs in the background to continue to run on 386-compatible systems. This means, for instance, that you can start a print job in your word processor, then move over to your spreadsheet for some other task while you continue to print in the background. Microsoft critics have long complained about the lack of multitasking in MS-DOS (and, by implication, in PC-DOS). But then, Microsoft and IBM might prefer that you buy Windows or OS/2 for your multitasking needs.

The other Novell exclusive is networking. Novell DOS 7 includes its own peer-to-peer network software, allowing you to create a small network without additional software. And just as Microsoft can virtually guarantee compatibility with Windows, Novell can feel confident its DOS will provide seamless connectivity with its own NetWare network operating system—as much an industry standard as anything is. Of course, just as all three DOSes can run Windows, they all work fine with NetWare. But Novell DOS gives you the comfort of dealing with a single vendor for your entire

network. For more details, see the sidebar "Novell DOS on a Network."

Read the Documentation

All programs are easy to use if you know how to use them. It's when you don't that you need the documentation.

IBM wins the printed documentation competition hands down. PC-DOS comes with four manuals: a 430-page user's guide, a 396-page command reference and error message book, a 130-page tutorial published by Que books, and a 40-page installation guide. Novell DOS includes a 432-page user's guide but lacks a tutorial or command reference (although the online help includes the latter). Microsoft offers two similarly priced ways to buy MS-DOS 6.2, each with different documentation. You can buy the standard upgrade (not to be confused with the 6.0 to 6.2 StepUp), which comes only with the inadequate, and now dated, 354-page book that accompanied version 6.0. Or you can buy a special version of Dan Gookin's book *DOS for Dummies* (IDG Press) with upgrade disks.

Online documentation is another matter. Novell DOS leads the pack with a near-clone of the printed manual, plus the aforementioned command reference. It's exhaustive and relatively easy to search; chances are you won't really need the printed manual. MS-DOS 6.2's expanded help feature, added in 6.0, isn't bad. PC-DOS, however, lacks even that, offering just a screenful of syntax when you type a command and /?

Getting Them Going

All three systems have easy-to-use installation programs. You put the first floppy disk in drive A:, type a command, choose the features you want to install, and wait while the installation program copies files to your hard disk and then prompts you to put in the next floppy.

Because PC-DOS and MS-DOS share so much code, installing one is pretty much the same as installing the other. Novell's installation program, however, has a different feel that's only partially due to its more graphical, mouse-driven interface. Novell DOS offers many more choices, some of which require a pretty good understanding of how DOS works. Basically, if you're not a power user, get someone who is to help you install it. And if you have anything out of the ordinary in your AUTOEXEC.BAT or CONFIG.SYS, make backup copies of those files, then delete (or REM out) all the commands that depart from a plain vanilla system before you start the installation.

Novell's installation does have one nice touch: You can use the same menu and mouse interface to fiddle with your configuration *after* you've installed the operating system. This makes it easy (well, easier, at any rate) to juggle memory management parameters, set up multitasking, and set other features that would otherwise require fussing directly with CONFIG.SYS and AUTOEXEC.BAT. It may not handle all of the changes that you want to make, but it does take care of the most common ones.

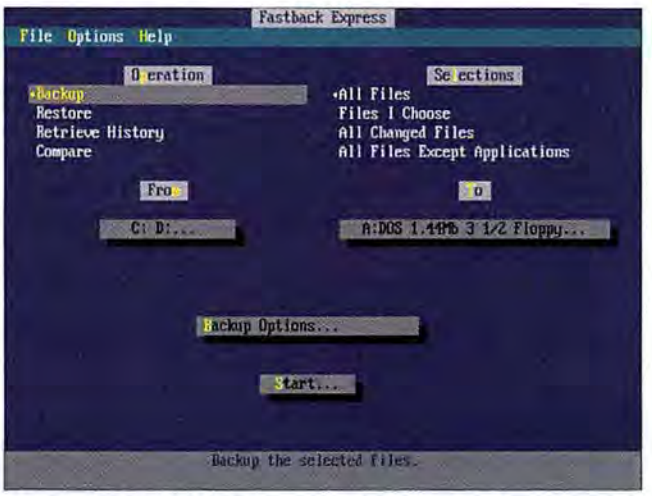
Once installed, the three systems vary in how much disk space they require—the added utilities aren't exactly free. Installing all of MS-DOS 6.2's options—including both the DOS and Windows versions of the backup, antivirus, and undelete programs—will put 7MB of files onto your hard disk. PC-DOS 6.1 with the same choices weighs in with 10MB of files. But it's Novell that takes the biggest bite: Installing everything, including the peer-to-peer networking option, puts 336 files—nearly 12MB of data—into eight different directories; omit the network, and you'll get 7.2MB in four directories.

All three DOSes come with an uninstall option that can return you to your prior operating system. If you discover a serious incompatibility after upgrading your system, it's nice to know you can easily go back to your old way of doing things.

So Who Wins?

Is there an obvious winner? MS-DOS has ScanDisk, more safety features for DoubleSpace, CD ROM caching, commas in big numbers, simple batch file debugging, safer MOVE/COPY/XCOPY commands, and some lesser bells and whistles. But what MS-DOS really has is the installed base; everyone has MS-DOS, and almost every PC comes with it. Microsoft controls Windows too, so the company defines what its competition has to be compatible with.

MS-DOS has, in fact, become the safe choice. It's not necessarily the leading-edge choice, or the risk-taker's choice, or the technology wonk's choice, but the choice you make when even a minuscule chance of downtime or lost data spells disaster. Like thirtysomethings who shriek in horror when they realize they're turning into their parents, some folks at Microsoft must be appalled to discover they've become IBM.



EASY BUT LIMITED BACKUPS: Novell DOS 7 comes with Fastback Express, a backup utility from the now defunct Fifth Generation Systems. The user interface is nice, but it can't back up to tape drives.

And today, no one is getting fired for recommending that the company buy Microsoft.

PC-DOS offers pen and PCMCIA support, portable compressed floppies, and more complete utilities. Even with the added benefit of nearly unquestioned compatibility with MS-DOS, though, PC-DOS 6.1 isn't attracting much attention. Its major market—almost its only market—continues to be the IBM installed base.

For that matter, PC-DOS can't even claim all the new IBM machines. It's amusing that IBM's Ambra and PS/1 machines come with MS-DOS and Windows. Imagine that happening a few years ago.

Novell DOS 7 brings the biggest platter of goodies to the feast, but it's difficult to visualize many people coming to the table. DR DOS built a small, fanatically loyal following, especially as it continued to beat MS-DOS to the punch with new features. But most of those customers were pretty sophisticated users, eager to stay out on the

leading edge of the curve and willing to deal with the risks out there. That's a noisy market; it's not a mass market.

Novell's networking and multitasking make this operating system a tempting choice, but its compatibility and reliability have yet to face the rigors of tens of millions of users and the myriad hardware and software environments they represent. If Novell DOS passes the compatibility test, many users—especially NetWare clients—will be tempted to make the move. That represents a lot of machines, and Novell can present a compelling case for complete integration of network and operating system technology and support. But the very size of these installations makes them the most vulnerable to operating system problems.

If your office is running NetWare, you may want to give Novell DOS a try—at least on a nonproduction system. But you probably shouldn't risk your operation on it—at least, not yet.

If you're addicted to technology, you'll probably find Novell DOS irresistible. Technophiles have traditionally been DR DOS's major market, and although this group is small, it's vocal and influential.

If you need more safety than Novell can yet guarantee, but you're looking for some utility bargains with your operating system, get IBM's PC-DOS. It has the same core as Microsoft's with a better set of add-ins.

But if you're like most people, you'll probably want to follow Microsoft's siren song of safety. There's simply no risk involved. And chances are that MS-DOS 6.2 will be the operating system on any new computers you buy this year, since PC manufacturers will be hesitant to jump ship. Competition is brutal, and none of them wants to be the first to offer something that might worry its customers. Innovation is a tough sell in a commodity market.

Life really was simpler ten years ago, but not nearly as interesting.

Van Wolverton is the author of nine computer books, including Van Wolverton's Guide to DOS 6 *(Random House Electronic Publishing, New York, 1992) and* Van Wolverton's Guide to OS/2 2.0 *(Random House Electronic Publishing, New York, 1993). Brett Glass is a contributing editor for* PC World. *He can be reached on PC World Online (see page 12 for contact information).*

WHERE TO BUY

IBM PC-DOS 6.1
List price: $189 for base product, $109 for upgrade (must already have DOS installed)
IBM
800/772-2227

MS-DOS 6.2
List price: $77.95 (upgrade only, must already have DOS installed); MS-DOS 6.0 to 6.2 StepUp $9.95 (must already have DOS 6.0 installed)
Microsoft Corp., 800/426-9400
Reader service no. 697

MS-DOS 6.2 Upgrade for Dummies, Special Edition
Estimated list price: $77.95
IDG Books
800/762-2974
Reader service no. 701

Novell DOS 7
List price: $99
Novell
800/453-1267, 801/429-7000
Reader service no. 702

FEATURES COMPARISON

What You Get With the DOSes

In the feature race, IBM and Novell have to beat Microsoft just to stay in the game.

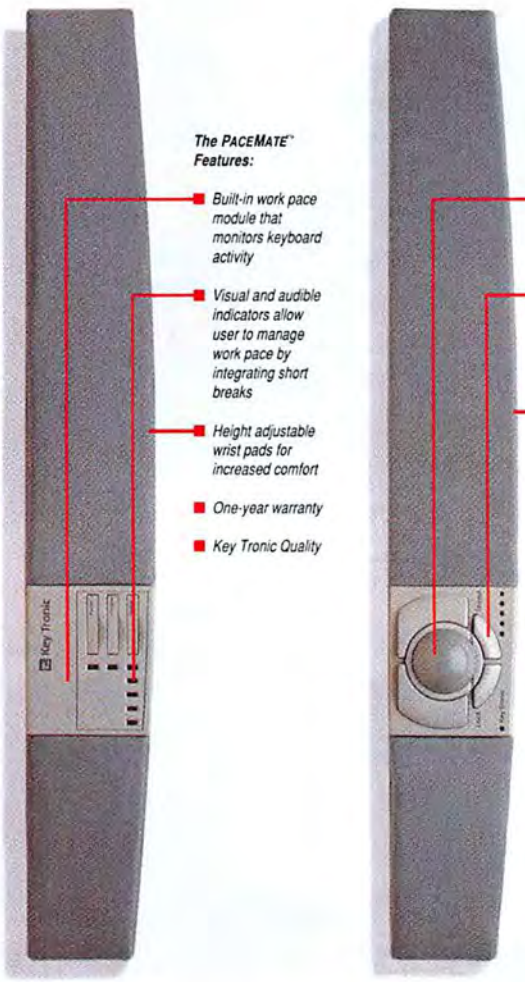
● Yes
○ No

Standard features	IBM PC-DOS 6.1	MS-DOS 6.2	Novell DOS 7
List price	$109/$189[1]	$77.95	$99
Minimum disk space required[2]	5.2	5.2	5.3
Maximum disk space required	10.0	7.0	11.6
Maximum available conventional memory (K)	620	622	626
Memory management	●	●	●
Memory optimizer	●	●	○
Reconfiguration program	○	○[3]	●
Task switching	●	○	●
Multitasking	○	○	●
Networking	○	○[3]	●
Shell	●	○	○
File compression			
Disk diagnosis and repair	●[4]	●	●[4]
Disk optimizer (defragger)	●	●	●
Automatic mount of compressed volume	●	●	●

Standard features cont'd	IBM PC-DOS 6.1	MS-DOS 6.2	Novell DOS 7
Compressed floppy usable anywhere	●	○	●
Automatic uninstall	●	●	●
Backup	●	●[5]	●[5]
Undelete	●	●	●
Antivirus	●	●	●
Disk defragmenter	●	●	●
Multiple configurations	●	●	●[6]
Printed documentation (manuals)	●	●[7]	●
Online documentation (help)	●	●	●

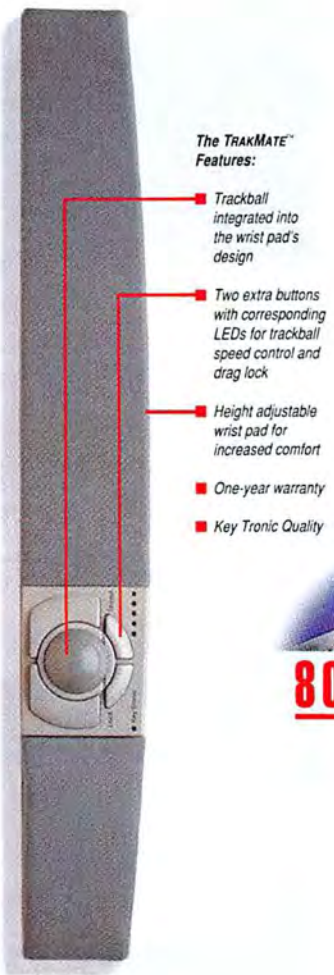
[1] Upgrade, which requires an existing version of DOS, costs $109; full version costs $189.
[2] Includes basic utility set: file compression, backup, antivirus, and defragger.
[3] Requires DOS Shell files either on supplemental disk or left over from DOS 6.0.
[4] Minimal, command-line CHKDSK program.
[5] Neither MS-DOS 6.2 nor Novell DOS 7 will back up to a tape drive, the most popular backup medium.
[6] Not compatible with MS-DOS 6.2 or PC-DOS 6.1.
[7] Documentation not updated since version 6.0.

Wrist Management.



The PACEMATE™ Features:

- *Built-in work pace module that monitors keyboard activity*
- *Visual and audible indicators allow user to manage work pace by integrating short breaks*
- *Height adjustable wrist pads for increased comfort*
- *One-year warranty*
- *Key Tronic Quality*



The TRAKMATE™ Features:

- *Trackball integrated into the wrist pad's design*
- *Two extra buttons with corresponding LEDs for trackball speed control and drag lock*
- *Height adjustable wrist pad for increased comfort*
- *One-year warranty*
- *Key Tronic Quality*

Key Tronic Offers Workplace Solutions That Add Productivity and Comfort.

Helping workers do more with greater comfort is one of the big challenges facing today's workplace. And products from Key Tronic are designed to do just that.

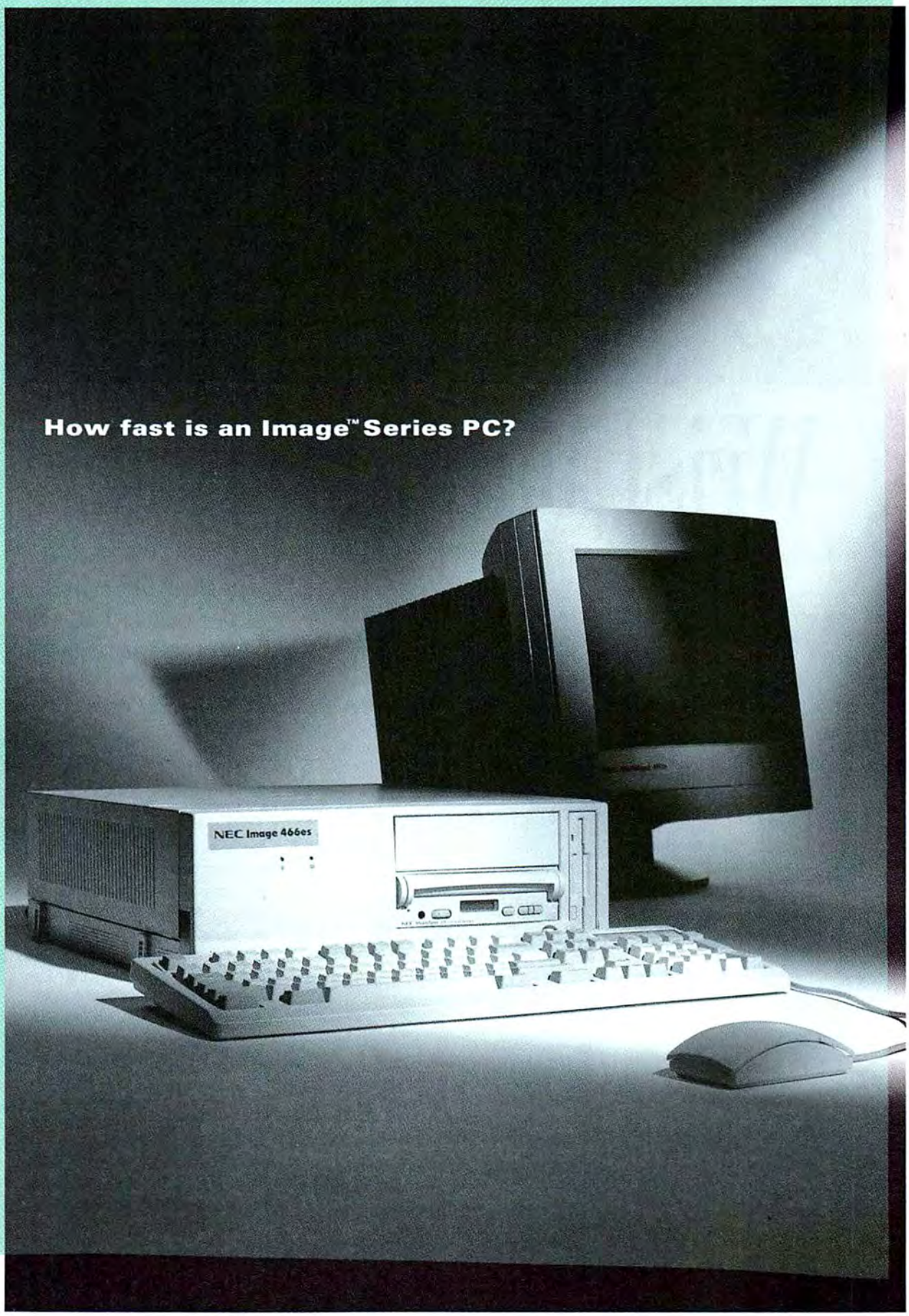
The free-standing adjustable wrist pad products from Key Tronic offer users a comfortable resting surface for wrists and palms. The TRAKMATE™ wrist pad features a powerful trackball unit for quick, easy access to point and click functions. The PACEMATE™ wrist pad features an integrated work pace module that monitors keyboard activity, work periods and rest times.

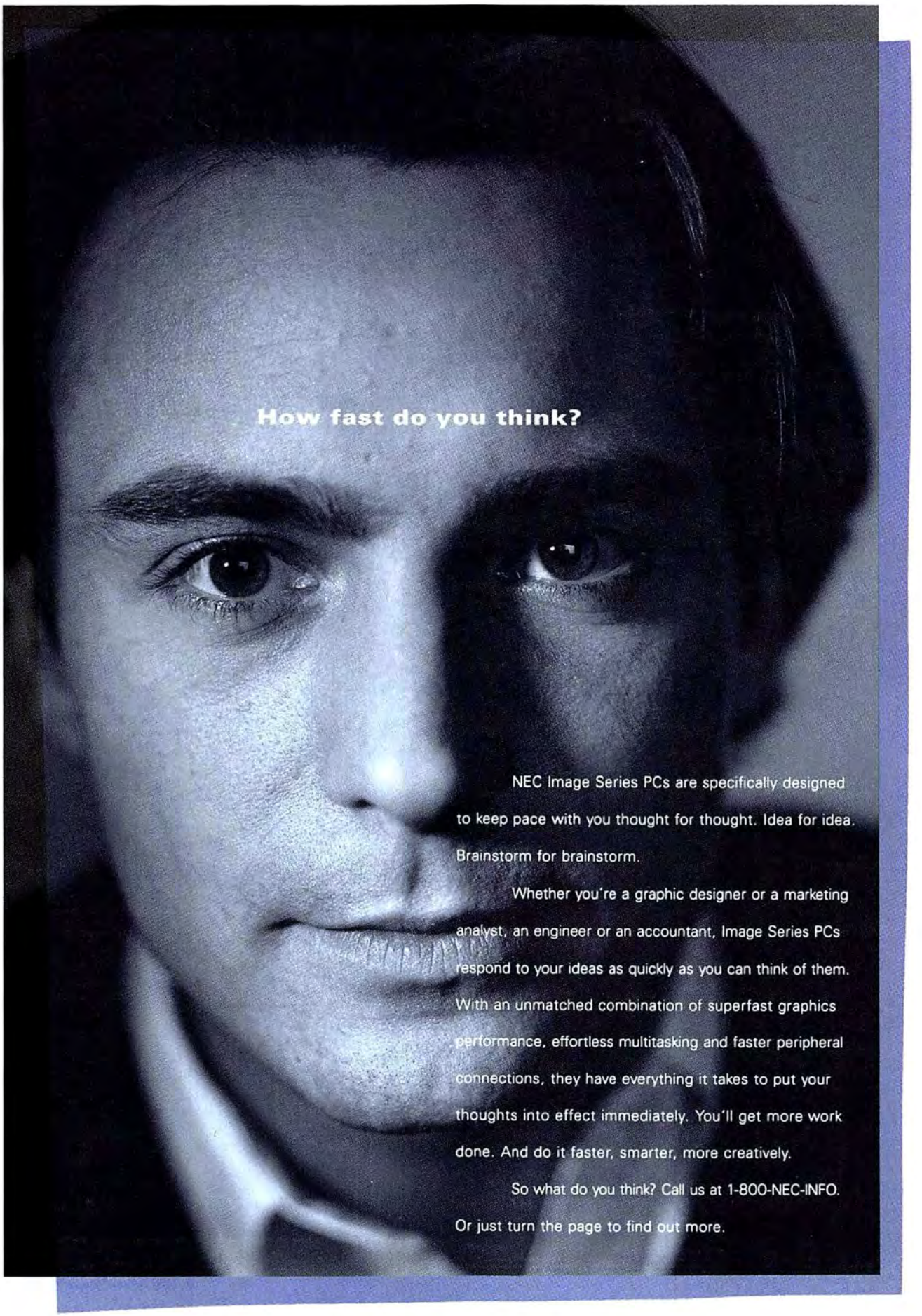
800-262-6006

Find out more about Key Tronic products and how they can help make your workplace more productive today! Just call 1-800-262-6006 in the U.S. or 1-800-348-6006 in Canada for the name of the dealer nearest you.

Key Tronic®

©1993 Key Tronic Corporation. Key Tronic is a registered trademark of Key Tronic Corporation. The Key Tronic logo, PACEMATE and TRAKMATE are trademarks of Key Tronic Corporation. All other names are registered trademarks (®) or trademarks (™) of their respective companies.


How fast is an Image™ Series PC?
NEC Image 466es



Circle 203 on reader service card

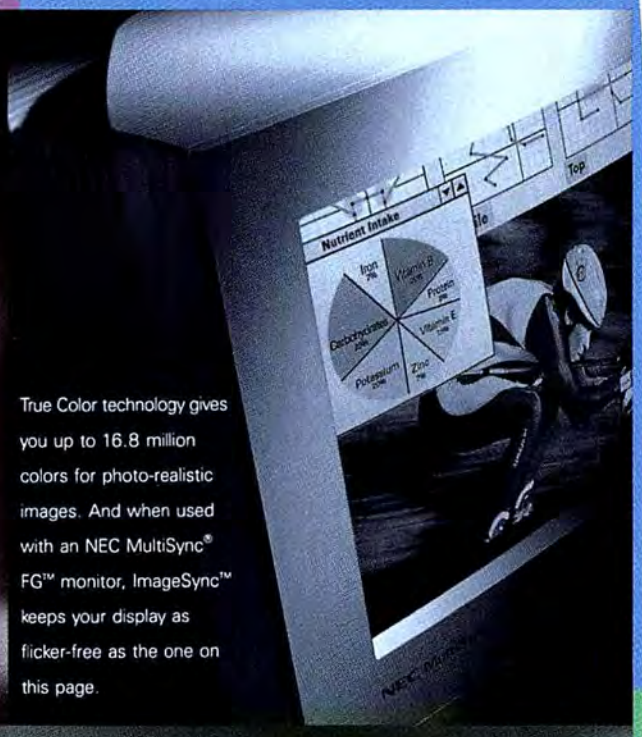
Some more information to bring you up to speed.

The Image 466es for advanced business and graphics applications.

Image 466es with optional MultiSpin® 3X CD-ROM drive.

Image Series PCs respond quickly to your ideas because every feature is designed to work fast on its own. And even faster together.

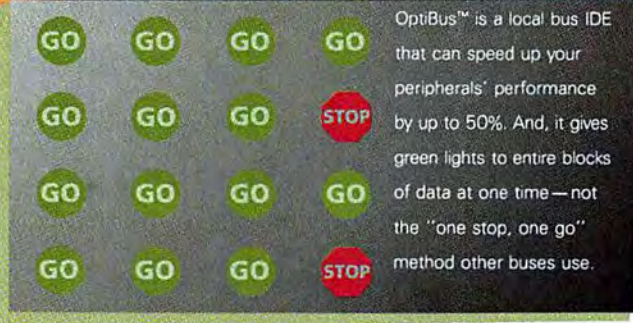
The PowerMate® 466es for general business applications.



True Color technology gives you up to 16.8 million colors for photo-realistic images. And when used with an NEC MultiSync® FG™ monitor, ImageSync™ keeps your display as flicker-free as the one on this page.

For the fastest graphics performance in this class of PCs, Image Video™ combines 32-bit VESA local bus video with a graphics accelerator, linear addressing and 1MB of superfast 45ns video memory.

At the heart of every Image Series PC is our 237-pin ZIF OverDrive™ socket, which ensures that upgrading to Pentium™ and faster processor speeds is quick and simple.



OptiBus™ is a local bus IDE that can speed up your peripherals' performance by up to 50%. And, it gives green lights to entire blocks of data at one time—not the "one stop, one go" method other buses use.

intel inside

energy
EPA POLLUTION PREVENTER

Call 1-800-NEC-INFO for a data sheet, benchmarks and white papers. For FastFacts,™ call 1-800-366-0476 and request document #46243.

MultiSync, MultiSpin and PowerMate are registered trademarks and Image, OptiBus, Image Video, ImageSync and FastFacts are trademarks of NEC Technologies, Inc. The Intel Inside logo is a registered trademark of Intel Corp. All other trademarks or registered trademarks are the property of their respective holders. The Energy Star emblem does not represent EPA endorsement of any product or service. Specifications subject to change without notice. NEC GSA#GS00K91AGS5241. © 1993 NEC Technologies, Inc.

NEC

Circle 203 on reader service card

Is Compression Worth It?

LUIS DELGADO

BY BRETT GLASS

It's a fundamental law of nature: No matter how much hard disk space you have, it's never enough. Programs are getting fatter and demanding more storage, especially Windows programs. So unless you've recently bought a system with a hard disk that—at least for the moment—still seems large enough, you probably need some way to increase capacity.

DOS 6, Stacker, and other programs increase your disk size with on-the-fly compression. But is the added capacity worth the risks?

You could, of course, buy a larger hard disk, but that can be an expensive and complicated proposition. As a result, many users are turning to on-the-fly disk compression programs such as Stacker or DOS 6.*x*'s DoubleSpace to effectively double the size of their hard disks. But are these programs a good solution to your storage woes? Some experts say that the gains are never as good as advertised, that on-the-fly compression slows down your computer, and that the whole idea is inherently unsafe. Are they right? We examined all these issues and came away convinced that compression is worthwhile—with some reservations.

For this article, we examined the two most popular products: DoubleSpace, included in every copy of MS-DOS 6.*x*, and Stac Electronics' Stacker 3.1, the best-selling disk compressor that you can buy without an operating system. There are other compression programs out there, including AddStor's SuperStor and

IIT's XtraDrive, but we decided to stay with the market leaders.

Disk compression utilities work in the background, intercepting all instructions to read from and write to the hard disk. What other programs see as a hard drive is actually a large hidden file. When you write to disk, the compression program shrinks your data and stores the slimmed-down version into this virtual drive; when you retrieve the file, the utility restores it to its original form. In theory, your other programs never know these changes are happening.

The Compression Bargain

Disk compression has one obvious virtue: it's inexpensive, and it costs the same whether you're compressing a 40MB or 2GB drive. The MS-DOS 6.*x* upgrade package, which includes a full operating system and a large set of utilities in addition to DoubleSpace, lists for $129.95 and costs about half that on the street. Stacker 3.1 has a list price of $149 and generally sells for $65 to $70. While Stacker is *only* a compression program, it has several features that make it more convenient than DoubleSpace. For instance, you can make compressed floppies that systems without Stacker can read.

If you pay $75 for compression software and with it can store 80 percent more data on your 100MB hard disk, you'll be paying less than $1 per megabyte (a good price for a hard disk). If your disk is bigger, you'll save even more.

How Much Space Do You Gain?

The first issue to consider is how much additional disk space compression offers. The answer is that there's no easy answer. Compression programs work by removing redundant data, and there's no way to predict how much redundancy a given file will have.

Certain kinds of files compress better than others. Check out "Test Report: How Much Space Do You Gain?" to see what we saved on a typical Windows PC. The most dramatic savings are in small files such as PIFs and BATs; not that those files are compressed more than others, but compression programs improve on DOS' wasteful way of storing small files. (On an uncompressed 150MB drive, a 1-byte file uses 4K of disk space).

But Windows users really need help with big files. Luckily, many of the major disk-wasting file types associated with Windows—such as BMPs, HLPs, and WAVs—get reduced substantially. But ZIP files, which are already compressed, don't get smaller. The final result for our "typical" PC: Compression ratios range from 1.6 to 1, to 1.8 to 1, and offer 60 to 80 percent more room on the hard drive.

How well a compression program does on any mix of files is impossible to predict, and that brings up another problem: The compression program can only guess how much free space you have on your compressed drive. If Stacker or DoubleSpace says you have 10MB free, don't try putting 8MB of ZIP files there.

One DoubleSpace utility, Vertisoft's SpaceManager, can improve DoubleSpace's compression until it approximates Stacker's. This add-in program can also regularly monitor your compression ratio to give you more accurate estimates of your drive's usable free space.

What's the Performance Penalty?

Constantly compressing and decompressing data is yet another burden on your computer's CPU, which can slow down your system. On the other hand, compression reduces the amount of information that must be read from the disk surface, which can speed up your system. To find out if the good effects outweigh the bad, we ran the PC World Test Center's Windows benchmark suite on a 386-33 machine with Stacker and DoubleSpace. See "Test Report: How Much Speed Do You Lose?" for details. Keep in mind, however, that your platform can also make a

PC WORLD TEST CENTER REPORT

How Much Space Do You Gain?

Stacker and DoubleSpace compress certain types of files better than others and store small BAT and PIF files much more efficiently than DOS.

Methodology

We compressed the contents of a 105MB Quantum ProDrive with about 80MB of program and data files on it. The ratios for Stacker were reported by a utility included with the program. The DoubleSpace ratios were both reported by SpaceManager, a separately sold utility that we later used to further compress the DoubleSpace drive.

Compression programs save disk space in two ways, and the ratios displayed here reflect both of them. In addition to actually compressing files, compression programs do not waste as much "slack" space between files as uncompressed DOS does. For that reason, small files show an unusually high compression ratio.

All figures show compression as a ratio to 1. For instance, if a 10K file is compressed to 5K, it's reported as 2.0, meaning that there was a 2.0-to-1 compression ratio. All ratios are averaged to a single decimal point.

difference. The faster your processor and the slower your hard disk, the more likely it is that compression will improve performance.

In all our tests, the uncompressed drive performed faster than the compressed one, although in most cases the difference was slight. The exception was our Paradox test, which slowed by factors of up to 50 percent when we used compression. Why? Databases are disk intensive and are therefore affected by anything that slows disk access. What's more, running a large DOS database under Windows is a lot to ask of a 386 with only 4MB of RAM. The added work of compressing and decompressing data may have been just too much for the computer to handle easily.

If compression slows your system as it did ours, is the performance hit worth it? The answer to that question depends on the hardware and software you're running and the amount of degradation you're willing to tolerate. "The first thing I'd do with any laptop is DoubleSpace it," says Desaware's Daniel Appleman. He's not alone; many users agree that compression is essential on laptops, no matter what the performance cost.

One resource that's even more precious than hard disk space is conventional memory—the first 640K of RAM. A compression program can use up as much as 56K of that. Fortunately, memory managers usually save the day by loading your compression program and other resident software into upper memory. If you're using DoubleSpace, you've already got DOS 6.*x*, which comes with a decent memory manager and a program, MEMMAKER, that will help you load these programs out of the way into upper memory blocks. If you find that MEMMAKER is inadequate, however, you may want to invest in a first-class memory manager such as Quarterdeck's QEMM386, Qualitas' 386Max, or Helix's Netroom.

PC WORLD TEST CENTER REPORT

How Much Speed Do You Lose?

Stacker and DoubleSpace slowed all the applications we tested, especially the disk-intensive Paradox test.

	Word for Windows 2.0	Excel 4.0	Paradox 3.5	Freelance for Windows 1.0
No Compression	4:45	4:14	5:13	4:45
Stacker	5:05 7% penalty	4:23 4% penalty	7:27 43% penalty	4:48 1% penalty
DoubleSpace	5:05 7% penalty	4:25 4% penalty	7:50 50% penalty	4:49 1% penalty

Methodology
Compression options are arranged in order of overall speed, from fastest at top to slowest at bottom. Test results are in minutes:seconds, with the percentage increase from an uncompressed time displayed under the times. (Lower is better in all situations). All tests were run on a 386-33 system with 4MB of system RAM. We used DOS 6.0 running the SmartDrive 4.0 read and write disk cache (1MB cache). We configured Windows on all systems with a Hewlett-Packard LaserJet III as the default printer driver, disabled the Print Manager, and routed the printer output to DOS's NUL: device. The system used the default VGA video driver that came with Windows. Finally, we loaded the test applications, test files, scripts, and Microsoft Test (automation software).

Word for Windows 2.0
We spell-check and scroll through a 27-page document; create, format, print, and save a single-page business letter; open a business proposal document, add a paragraph, then preview and print it.

Excel 4.0
We perform several data extracts; build and format a financial statement from scratch, then print it; open a mortgage analysis, then scroll, move blocks, change the interest rate, print preview the statement, and save it.

Paradox 3.5
Running the program in a DOS window, we perform a variety of data entry, record searching, and updating tasks. Then we generate reports against a simple customer list.

Freelance for Windows 1.0
We load a single-page starter file (built from a standard template included with Freelance) containing a U.S. map with each state as a separate object. Then we enter preformatted text on the page in preset headings, add a second page, and enter text as bullet items. We add three more pages—each containing a single 3-D bar chart—and import data from a 1-2-3 WK1 file. Next we add a sixth page containing four 3-D pie charts and preview a slide show using a vertical-louver fade effect between slides. We apply various views to the presentation and preview the slides four more times, applying a different fade effect between slides each time. Finally, we save the presentation to disk.

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

Will It Corrupt My Data?

A lot of users eschew compression because they worry about losing data, and there is some validity to that concern. Because your files are in a compressed form, you can't get to them without the compression program or another utility that supports the compression program; that's one more thing to deal with in an emergency. What's more, in order to restore a byte of data to its original form, the compression program needs to know—with 100 percent accuracy—the values of all the bytes that came before it in the same sector. So, while one corrupted byte of data on an uncompressed drive doesn't affect any of the bytes around it, one wrong byte on a compressed drive can render up to 8K of compressed data irretrievable.

With the release last year of DOS 6.0 and DoubleSpace, reports of compression catastrophes skyrocketed. While Microsoft blames these problems on user error or faulty hardware, it appears—from messages posted on CompuServe and tests conducted by *PC World*'s sister publication *InfoWorld*—that some machines that run perfectly well under normal conditions lose data when used with DOS 6.0 and DoubleSpace.

No one has isolated the source of these problems, or at least no one is admitting it. Some CompuServe users speculate that DoubleSpace overstresses hard drives, thereby overtaxing hardware that's already in danger of failing. From a technological standpoint, however, this argument doesn't hold water: A compressed disk actually moves its heads less and reads and writes less data than an uncompressed disk.

Other sources have blamed Microsoft's SmartDrive disk cache. The version of SmartDrive that shipped with DOS 6.0 returns users to the DOS prompt before writing all the data to disk. That could lead to a corrupted hard disk if you turn your system off too soon. But this doesn't explain all the problems, because some users never turn their systems off and still experience data corruption. DOS 6.2, which should be available by the time you read this, promises to fix several problems with both DoubleSpace and SmartDrive.

Nevertheless, many users remain cautious. Mike Edgerton,

owner of Central Jersey Warehousing in Avenel, New Jersey, maintains a 7-node LANtastic network. Edgerton uses compression on his personal laptop, but says, "I'm not comfortable enough with any disk compression yet to use it on my network."

Not everyone agrees that compression is dangerous. Harry Sutton, a project manager for PRC, a defense contractor in McLean, Virginia, is in charge of a submarine communications test and evaluation project. DoubleSpace, he says, "has been rock solid for me and those in my office who use it." Sutton, a strong advocate of disk compression in general and DoubleSpace in particular, says the reported data loss is due to user error or PC problems that are unrelated to DoubleSpace.

Helen Fiorentini, an independent businesswoman who runs Helena's Professional Documents, doesn't agree. She reports that, even though she followed Microsoft's instructions to the letter, she had to abandon DoubleSpace after losing programs and data on her mission-critical machine. "My PC *is* my business," says Fiorentini. "I'm not the most knowledgeable hardware-software person in the world, but for now DoubleSpace has me gun-shy about messing with my hard drive's files."

Judith Miner, a freelance writer and desktop publisher, is still using DoubleSpace despite a near-disastrous experience. After Windows crashed one day, she found her compressed drive file corrupted beyond use. The damage was so severe that the command DBLSPACE /CHKDSK froze the system instead of diagnosing the problem. Luckily, Miner was able to wipe everything off her drive, reinstall DoubleSpace, and restore the data from a recent backup. Her advice to other users: "Back up, back up, back up! If you're backed up, you have nothing to fear."

Backing up is always a good idea, but some users who back up infrequently or are concerned about losing data they generated between backups take another approach. All the disk compression programs on the market allow you to compress only *part* of your drive. By placing only programs, which can be restored from the original distribution disks, on the compressed drive, their precious data remains in a safe, uncompressed form. The downside of this method? If you lose the compressed portion, you may need to spend a long time reinstalling applications.

Harry Sutton: "DoubleSpace has been rock solid for me and those in my office who use it." Helen Fiorentini: "My PC is my business, [and] DoubleSpace has made me gun-shy."

The Bottom Line

Disk compression is a simple, quick, inexpensive way to boost your system's hard disk capacity. But is it worth the risk and the performance penalties? The answer appears, as is usually the case, to be financial. If money were no object, everyone I interviewed would have bought a larger hard drive rather than use compression. But in the real world, money is an object (unless you happen to be Bill Gates). If the cost of a new drive would hurt your wallet significantly enough to make a small performance hit bearable, you should go ahead and compress. And back up regularly.

Brett Glass is a contributing editor for PC World. *He can be reached on PC World Online (see page 12 for contact information).*

Other Ways to Expand Storage

If you're hesitant about using a disk compression program, there are other ways to increase your storage capacity. The most obvious is to bite the bullet and buy another hard drive. If you do you'll pay approximately $1 per megabyte by mail order—less if you go for a reconditioned drive, more if you need a proprietary model.

Getting a drive and having it installed (or installing it yourself) isn't always painless, however. If you buy an IDE drive, for instance, you may find that it won't coexist with your older drive or with a drive and controller that use an MFM, RLL, or ESDI interface. In fact, you might have to retire your old drive, even if it still works. Then you'll probably need to tinker with CMOS settings and formatting programs before you can use your new drive (if you're lucky).

Another solution is removable media—the cartridge drives made by SyQuest, Iomega (Bernoulli), and others. The good news about these drives is that you'll never run out of storage—as long as you keep buying cartridges. The bad news is that these drives don't save you money; they just let you spend it a little at a time. Cartridges are nearly as expensive as hard disk space—from 50 cents to $1 per megabyte after you've bought the more expensive drive. Finally, there's a speed penalty far in excess of compression's: Removable cartridge drives have access times at least twice as long as those of a good hard drive.

Finally, you can use file-archiving programs such as PKZip, which also compress your data, but not on the fly. You'll need either to decide what to compress and add it to an archive manually, or to develop clever batch files that periodically handle the task. PKZip has a notoriously difficult command-line interface, but many DOS and Windows file-management utilities—such as PC Tools, Norton Commander, XTree, and Outside In—let you handle your ZIP files almost as easily as you do directories.

WHERE TO BUY

MS-DOS 6.2
List price: $77.95
Microsoft Corp.
800/426-9400
Reader service no. 697

SpaceManager
List price: $89.95
Vertisoft Systems
800/466-5875
Reader service no. 698

Stacker 3.1
List price: $149
Stac Electronics
800/522-7822,
619/431-7474
Reader service no. 699

QEMM 7 finds room nobody else can.

Sooner or later, you'll get an "Out of Memory" message. Whether you have 1 megabyte or 16.

TSRs and network utilities need memory right where your programs need it, too. It's called 'lower' or 'conventional' memory.

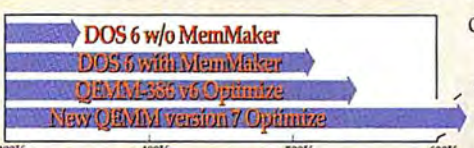
Adding RAM to your PC just gives you more expanded or extended memory — accessible to some programs, but not to TSRs like fax utilities, device drivers or network utilities like Novell NetWare. Fortunately, there's an easy software solution to 'out of memory' problems. NO VACANCY

Have Your Cake and Eat it, Too.

The more memory you have, the more flexibility and reliability you can enjoy. Thanks to our patent-pending 'stealth' technology, QEMM finds as much as 96K more high memory than other memory managers.

No one has yet been able to match our performance. No wonder QEMM outsells all the others *put together*!

QEMM™ puts the maximum memory right where your favorite programs need it so you can run them and TSRs without 'out of memory' problems or conflicts. That keeps your PC running smoothly and performance at its best.



We tested DOS with and without MemMaker and with QEMM 6 and our new QEMM 7 runs away from all of them. See details of test conditions below.

"I needed another 32K for my favorite TSR. I added 2 megabytes. I still need 32K! What gives?"

Protect Your Productivity; Keep Your Work Safe.

Any task, from programming to writing the company business plan to composing a personal letter, takes time and thought. Your PC is supposed to make that process easier; your output better. When you can't run your favorite grammar-checking TSR or have to get by without a vital network utility, you're sacrificing productivity.

Whether you're running MS-DOS, IBM™ PC-DOS, DR DOS, Novell DOS or MS Windows; one megabyte or eight, don't sacrifice; don't compromise; don't risk losing work.

QEMM comes with the new version of Manifest, the award-winning memory analyzer that helps you see how your PC works.

Managing your memory well is the best way to assure your work won't go to waste.

QEMM version 7 is the most powerful, flexible memory manager you can buy. It's the utility that finds memory when nothing else can. VACANCY

Quarterdeck

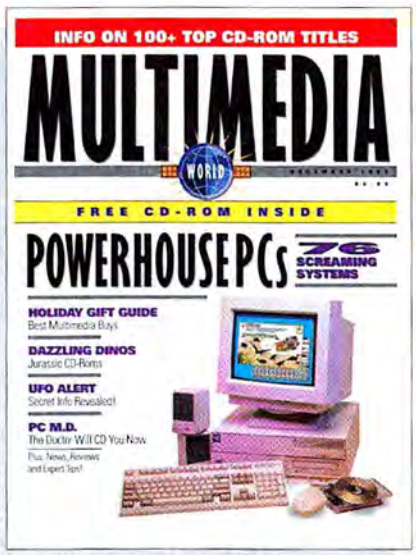
Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (310) 392-9851 Fax (310) 314-4219

How we got the chart numbers: CPU—486/33 ALR Power business VESA machine equipped with 16 megs of RAM and running MS-DOS 6. Comparisons were done using the following memory managers: QEMM 7, QEMM 6.02, MS-DOS 6 MemMaker. In addition to the driver (or drivers) required by each memory manager, the following drivers, DOS resources and programs were loaded for all comparisons in the CONFIG.SYS file: SETVER.EXE, DOS=HIGH, FILES=20, BUFFERS=10, STACKS=0,0, MVSOUND.SYS, SNDBLLSYS, SLCD.SYS, DOS SHELL=statement, in the AUTOEXEC.BAT file: VSAFE, MSCDEX, UNDELETE, LSLCOM, NE2000.COM, IPXODI.COM, NETX OR EMSNETX, MOUSE.COM, SMARTDRV.COM, PRINCAP.COM. ©1993 Quarterdeck Office Systems. Trademarks are property of their respective owners.

Circle 189 on reader service card

CONFUSION

ORDER



Multimedia computing is the most exciting, fastest growing segment of the PC market. There are hundreds of new products — both hardware and software — being introduced monthly.

Now you can let **Multimedia World** magazine bring order to the confusing choices that confront you.

Available on newsstands everywhere, each month **Multimedia World** brings you news, reviews, and buyers' guides for the latest multimedia equipment and software titles.

So order **Multimedia World** through this special offer and we'll give you 80 megs of clip art on a CD-ROM disk **free**. That's right, you can order the next 12 issues of 90+ page **Multimedia World** magazine and receive an 80 meg CD-ROM disk for free.

MULTIMEDIA WORLD

Call us on our **TOLL FREE** number and order **12 issues of Multimedia World magazine for only $9.97.** Act now and we'll give you a **FREE ARIS ENTERTAINMENT CD-ROM** with over 80 megabytes of clip art with your paid order. Call now.

1-800-766-3294 ext.205 (3AAC8)

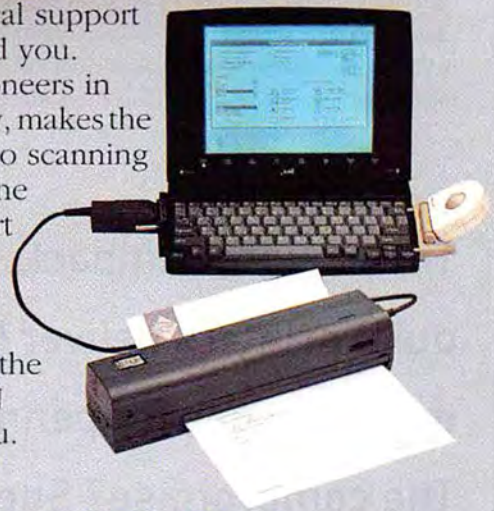
Multimedia World Magazine, 501 2nd street, 1st floor, San Francisco, CA 94107 • Fax (415) 882-0936

Our portable full-page scanner is a foot long. And cuts the mustard.

Introducing the world's first and only portable, full-page scanner: The NISCAN Page. At under three pounds, the Page is everything you've been waiting for. And less.

400 dpi resolution. 256 shades of gray. You get advanced OCR, image editing and fax-on-the-fly software for any IBM-compatible PC or notebook. And it's equipped with a rechargable battery and an AC adaptor. (Condiments extra.) Plus, there's a one year warranty, service and technical support always right behind you.

NISCA, pioneers in imaging technology, makes the Page your answer to scanning on the run. Make the NISCAN Page a part of your arsenal in the office, at home or on the go. Call (214) 242-9696 for the authorized NISCAN distributor near you.



NISCA

image is everything®

NISCA INCORPORATED 1919 OLD DENTON ROAD • SUITE # 104
CARROLLTON, TEXAS 75006 • Office: 214 / 242-9696 • Fax: 214 / 245-0942
NISCA CORPORATION, KOFU, JAPAN

GSA # GSOOK93AG56180

Circle 139 on reader service card

Ink Jet Printers

Laser Quality for $300

Dreaming of a printer to call your own? Deciding which kind of machine to buy is especially hard if you're accustomed to laser printer quality but you have a dot matrix budget. Luckily, you can get professional-looking printouts without decimating your bank account. How? Buy an ink jet printer.

Ink jets crank out professional-quality text and graphics at less than half the cost of most personal lasers—many cost less than $300. They're also smaller, quieter, and they use far less power than their toner-melting cousins. That's one reason, according to International Data Corporation, why ink jet sales are growing faster than sales of any other kind of printer.

Of course, choosing an ink jet over a laser involves trade-offs; you'll have to give up some speed and paper-handling and font capabilities. But if you need a personal printer for everyday print jobs, you're tired of being stuck in network printer traffic, or you simply want to trade in your old dot matrix for a sportier model, ink jets offer a compelling alternative. And if you're stocking a home office, an ink jet may prove the ideal choice.

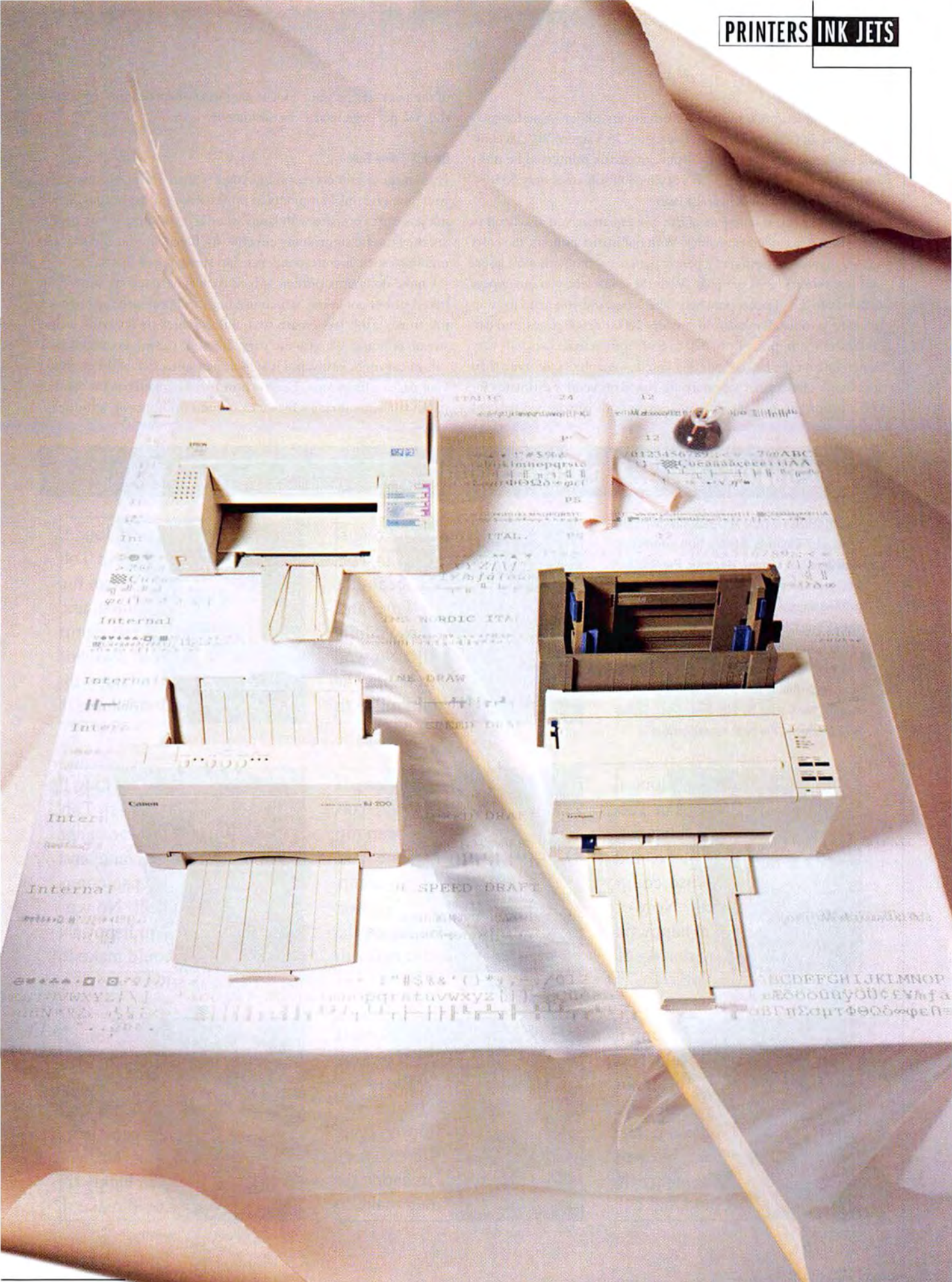
These eight compact, quiet printers deliver high-quality pages for pennies. The compromise? Speed.

By Daniel Tynan

The real question is whether an ink jet printer is the right compromise between laser quality and dot matrix price. To find out, we tested eight desktop ink jets costing from $275 to $350 on the street, from standard-setters such as Hewlett-Packard's DeskJet 500 and Canon's BJ-200 to the newest models from Lexmark, C-Tech Electronics, and Texas Instruments. All boast resolutions of 300 dpi or better, come with built-in sheet feeders, and are small enough to fit on even the most cramped desktop.

We wanted to see not only how these ink jets stack up against each other, but also how they measure up against their laser competitors. Since ink jets are budget machines, we gave top priority to price. Because they may be purchased in lieu of a laser, we demanded professional-looking output and adequate print speeds. Finally, we considered the intelligence of each printer's design, as well as its ease of use—key issues for machines aimed at individual users.

PHOTOS: GILES HANCOCK; IMAGING: MARK COOPER



CLOCKWISE FROM TOP: Epson Stylus 800, Lexmark ExecJet II, and Canon BJ-200

Prints Charming

There are at least 300 reasons for buying an ink jet—one for each dollar you save by not buying a laser. At $275, Canon's BJ-200 compares quite nicely with even 24-pin dot matrix printers. The most expensive ink jet here, Epson's Stylus 800 still costs only $350—hundreds less than the cheapest laser.

But street price is only part of the cost equation; you also need to factor in the cost of consumables. With dot matrix printers, the costs are negligible—a fraction of a penny per page—but with most lasers you pay about 3 cents per page. With these ink jets, you can expect to pay from 2 to 4 cents per page. That's because you need to swap in a new printhead–ink cartridge every 1000 to 2000 pages, and cartridges range in price from $20 to $50. Your actual costs will vary depending on the kind of printing you do—graphics cost more than text does. The figures we quote are based on vendor estimates for text documents, in which the ink covers approximately 5 percent of the page. If you print a lot of graphics (which require more ink), the cost per page increases considerably.

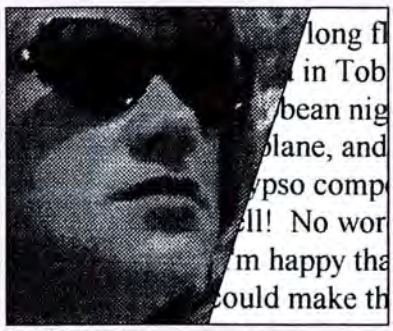
Quality Takes Time

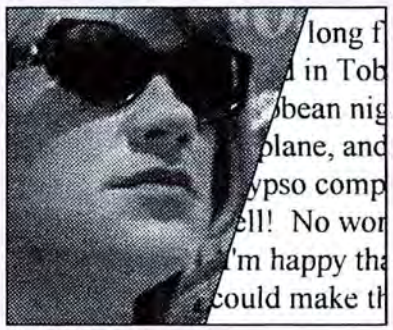
Even if these printers cost hundreds less than a laser, however, you won't use one unless it produces professional-quality output. While ink jets can't compete with lasers when it comes to printing graphics, they can be surprisingly effective for bread-and-butter business print jobs such as correspondence and spreadsheet charts.

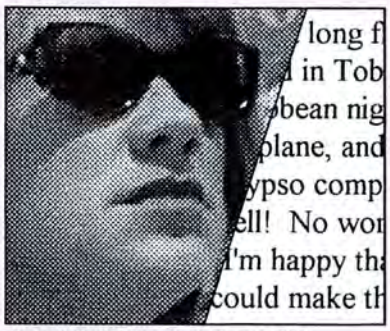
Unlike dot matrix printers, which create characters by striking an inked ribbon, or lasers, which use heat and pressure to apply dry ink (toner), ink jets create text and graphics by spraying a fine stream of liquid ink onto the page. Because the ink goes on wet, it can smear more easily and it sometimes spreads as it dries, giving your pages a fuzzy look. Exactly how fuzzy depends on the kind of paper you use—that's why we examined printouts on letterhead,

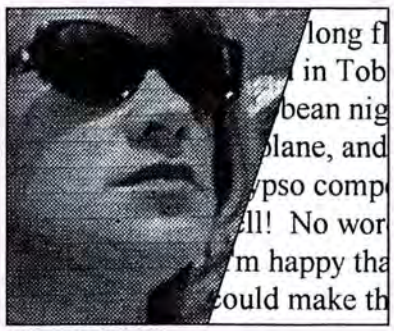
Laser Quality? You Be the Judge

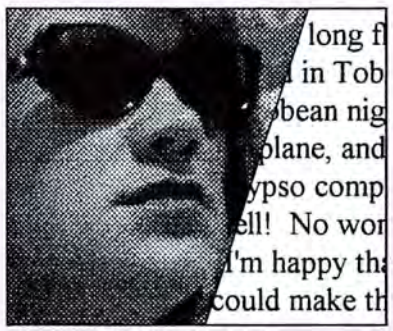
ACCORDING TO OUR JUDGES, Brother's HJ-400 and Epson's Stylus 800 produced excellent text output. However, the Brother had problems with graphics jobs; when it printed images at all, they came out muddy. The C. Itoh CJ-300 and TI microMarc, on the other hand, excelled at graphics but had trouble with text. So what do you do if you want high-quality text *and* graphics? For our money, the Canon BJ-200 and Epson Stylus 800 produced the best overall output.

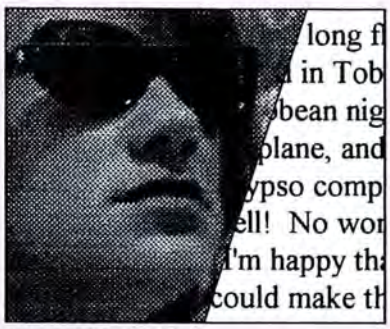

Brother HJ-400

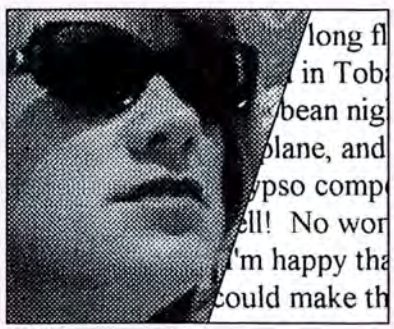

Canon BJ-200

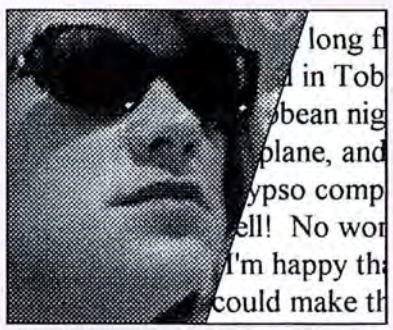

C. Itoh ProWriter SpeedJet CJ-300


Epson Stylus 800


Hewlett-Packard DeskJet 500


Lexmark ExecJet II


NEC Jetmate 1000


Texas Instruments microMarc

recycled paper, and transparencies as well as photocopier stock. We also applied the greasy digit test—running a wet thumb across the page—to gauge smearing.

Because rating output quality is subjective, we asked a panel of users to look at and rate some print samples from these ink jets—a typical business letter and a full-page scanned photo. As a basis for comparison, we slipped in a few printouts from standard 300-dpi HP lasers.

The results: Several of our judges actually preferred ink jet output to laser output. The Brother HJ-400 and Epson Stylus 800 cranked out the sharpest text, while the C. Itoh CJ-300 and TI microMarc produced the slickest graphics on all kinds of paper. Although no ink jet output was completely free from smearing, the HP DeskJet did the best job when the going got wet.

While you need adequate output quality, you also want your printouts quickly. It turns out some ink jets are actually faster than lasers when printing single-page text documents. That's because lasers need more time than ink jets to process the first page of a document. However, once the laser's print engine gears up—especially when printing longer documents or graphics—the ink jet's advantage evaporates quickly.

The fastest ink jet here, the Texas Instruments microMarc, cranked out a one-page Excel worksheet in less than 30 seconds—a better speed score than all but two of the personal laser printers we reviewed in July (see "Laser Printers From $700"). But this same printer was almost 30 percent *slower* than the most laggardly laser when it came to printing a three-page WordPerfect document.

It turns out that some ink jet printers are actually faster than laser printers when it comes to printing single-page text documents.

In general, you sacrifice speed when you choose an ink jet. Of course, performance varies depending on the drivers and fonts you use, as well as the amount of printer memory. And because a ink jets (like dot matrixes) have far less RAM capacity than lasers, they often slow down your system as their memory buffer empties and refills, especially with graphics (a good reason to add more memory to your ink jet). Windows is particularly sluggish while printing to an ink jet.

Print and Play

Even a fast printer is too slow if you have to dig into the manual to figure out how it works. Ideally, you should be able to unpack a printer, plug it in, install the software drivers, and start printing—without even glancing at the user manual. The front panel controls should be easy to use and able to alert you when things go sour. While none of these ink jets provide the LCD screen found on most lasers, the best feature buttons for reset and manual-feed modes and LEDs indicating when the ink is low or you're out of paper. Nobody can touch Lexmark's ExecJet II for intelligent, easy-to-use design.

A personal printer should also be, well, personal—and that means small and quiet. As a rule, ink jets are easier on the ears than either lasers or dot matrix machines, and no other desktop printer can match the 6.6-pound Canon for size.

Fonts Upon a Time

In the not-too-distant past, a printer's built-in fonts made the difference between professional-quality pages and amateur productions. Now, thanks to Windows 3.1 and TrueType, you can print snazzy-looking typefaces regardless of which fonts are inside the printer. However, if you use DOS apps, you'll still want lots of fonts and a big memory buffer that can handle downloaded soft fonts, as well as spool print jobs. The NEC comes with the most bit-mapped fonts, but only Epson and Lexmark offer scalable typefaces.

All of these ink jets come with paper feeders that handle 100 cut sheets or more—a bit less than most lasers. But in a personal printer, variety is more important than volume: The printer should accept letter- and legal-size paper, envelopes, labels, and transparencies (you'll have to use special ink jet transparency film). While all the printers offer comparable paper capacity, the Canon and Lexmark get high marks for their ability to feed envelopes and transparencies.

Finally, when disaster strikes, your best defense is a solid warranty and reliable tech support. Many vendors now offer two-year warranties, but only HP offers three years of protection. Overall, Epson offers the best combination of toll-free phone help, long support hours, and short turnarounds on repair.

Inkredible Deals

Picking a winner out of this crew was no easy task. Ultimately our Best Buy came down to the smallest contes-

Best Buy

For just $275 on the street, the Canon BJ-200 does everything you could ask of an ink jet printer. Its output is closer to that of a laser than any other printer here, its speed is acceptable, it won't take up much room on your desk, and it features the lowest price in the review. That combination of skills makes the BJ-200 our choice as Best Buy.

THE CANON BEAT out some stiff competition—including the well-designed Lexmark and HP's perennial DeskJet—to earn a Best Buy.

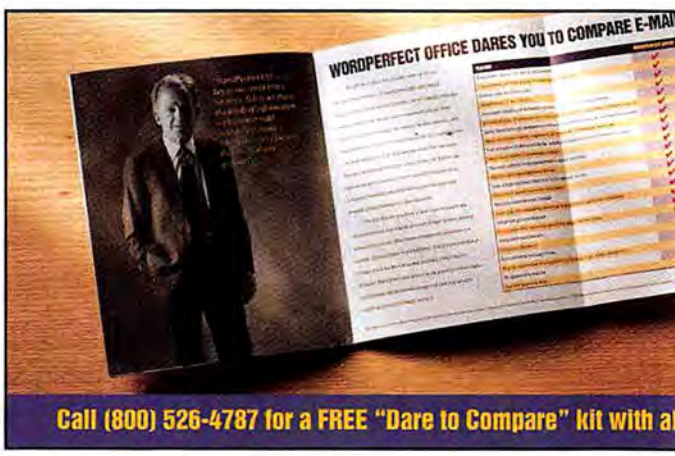
MICROSOFT AND LOTUS E-MAIL PRODUCTS TO

HERE'S WHY.

DARE TO COMPARE

WordPerfect Office

Microsoft and Lotus aren't going to publicly compare their e-mail products to something substantially better. That's why they never mention WordPerfect® Office in any of their e-mail comparison advertising. But while Microsoft and Lotus won't compare their products to WordPerfect Office, you should. Because choosing a workgroup application is a strategic decision that will affect the way your organization works for years to come.



Dare to compare more than just e-mail.

Even if you just compare e-mail features, WordPerfect Office 4.0 beats everything in its class. But it takes a lot more than

NEVER COMPARE THEIR WORDPERFECT® OFFICE.

	E-MAIL	INTEGRATED GROUP SCHEDULER	INTEGRATED CALENDAR	INTEGRATED TASK MANAGEMENT
WORDPERFECT OFFICE	YES	YES	YES	YES
MICROSOFT MAIL	YES	NO	NO	NO
LOTUS CC:MAIL	YES	NO	NO	NO

WordPerfect is a registered trademark, and WordPerfect Office is a trademark of WordPerfect Corporation within the United States and other countries. All other brand and product names are trademarks or registered trademarks of their respective companies. © WordPerfect Corporation 1993.

e-mail to run a business these days. WordPerfect Office is the *only* leading workgroup application that integrates group scheduling, a personal calendar and task-management functions with the industry's most powerful cross-platform e-mail engine. And WordPerfect Office gives you the complete package for what others generally charge for e-mail alone.

Call (800) 526-4787 for a FREE "Dare to Compare" kit

There are more than 100 different features you should compare when choosing a workgroup productivity product, and we can't begin to mention them all here. So we've prepared a free Dare to Compare demonstration kit, with a working copy of WordPerfect Office 4.0 and a detailed comparison guide. Find out for yourself why Microsoft and Lotus won't compare their e-mail products to WordPerfect Office. Call (800) 526-4787 for your free kit.

WordPerfect® Office

tant: the Canon BJ-200. While it didn't dominate any category, the BJ-200 offers the best combination of output quality, speed, and design—as well as having the lowest price. We also liked the Lexmark for its excellent design and the Epson, which garnered the best output scores overall. Machines like the Canon prove that you can find the personal printer of your dreams without depleting your budget. For just a few hundred dollars you can get professional-quality output, and you'll sleep better at night knowing that the extra cash is sitting in the bank, not on top of your desk.

Daniel Tynan is a contributing editor for PC World.

For more information about all products in this article, circle reader service no. 903.

Brother HJ-400

VITAL STATISTICS

Estimated street price: $299
PROS: Sharp text output, compact design
CONS: Slow, erratic graphics output
Contact: Brother Int'l Corp., 800/284-4357, 714/859-9700
Reader service no. 601

At times, Brother's HJ-400 is one terrific printer. This handsome $299 unit churned out the sharpest text in the bunch, and it comes with 30 TrueType fonts on disk. It's the only ink jet with both a built-in Macintosh port and a parallel port, and it switches between them automatically.

When it came to graphics output, however, the HJ-400 acted like the Brother from another planet. Some of our graphics print jobs came out as a jumble of alien-looking ASCII characters, and images that did print often looked muddy or bleached. The Brother's Windows driver offers minimal control over contrast and ink density, and the HJ-400 can't use drivers for any other printers.

The HJ-400's control panel is deceptively complicated, and instructions in the manual are not always accurate. To top it off, the HJ-400 is the slowest in the group. If you want to share a printer between a Mac and PC, the HJ-400 is a solid, low-cost option. Otherwise, we advise you to look elsewhere.

Canon BJ-200

VITAL STATISTICS

Estimated street price: $275
PROS: Tiny, cheap, fast, good-looking output
CONS: Limited control panel, noisy
Contact: Canon, 800/848-4123, 714/438-3000
Reader service no. 602

Canon's BJ-200 is proof that good things come in small packages. Despite being the lowest-priced printer in the roundup, our $275 Best Buy was good at just about everything, ranking in the top three for speed, output, and design.

Thanks to Canon's unique super-high-quality mode (SHQ), this 6.6-pound marvel produces some of the most laserlike text output we've seen from an ink jet. Characters look as sharp on letterhead as they do on plain bond. We found some slight banding in gray shades on graphics jobs, but blacks are dense and evenly colored, and lines are free from jaggies. The downside: Printing with SHQ takes 30 to 60 percent longer than in normal mode.

Of course, no printer's perfect. Despite its low 42db rating, the BJ-200 was noisier to our ears than most ink jets (though it's still quieter than a laser). Also, the control panel is a little too spare and lacks a reset button. But we can live with these faults. Canon's BJ-200 makes a fine addition to any desktop—and an excellent alternative to a laser—at a price that's hard to beat.

C-Tech Electronics C. Itoh ProWriter SpeedJet CJ-300

VITAL STATISTICS

Estimated street price: $329
PROS: Fast, excellent graphics
CONS: Inconsistent text output, erratic behavior
Contact: C-Tech Electronics, Inc., 714/833-1165
Reader service no. 603

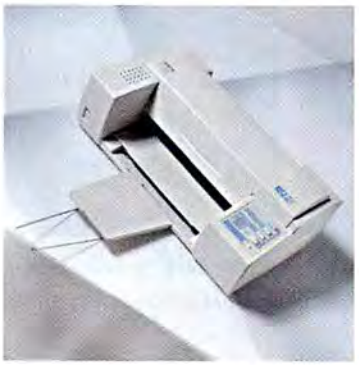
The $329 C. Itoh CJ-300 bears a striking resemblance to the NEC and Texas Instrument printers. No wonder: The three share the same TEC-designed engine, which results in similar overall designs. From the outside they look like triplets, but inside they differ significantly. For example, the CJ-300's small 16K buffer can be increased to 512K—larger than the NEC's or the Texas Instruments'—to make room for spooling print jobs and downloading fonts. DOS users will need it because the C. Itoh comes with only four internal bit-mapped typefaces.

The CJ-300 cranked out some great-looking images, tying TI's microMarc for top graphics output on our judges' scorecards. Text output was shakier, with characters looking a bit wiggly. The aptly named SpeedJet is also fast, especially with graphics; it ranked second overall in our speed test.

Unfortunately, the CJ-300's front panel controls are less than intuitive. And, like the Brother, it's prone to erratic behavior, such as spewing out pages of garbage characters after a canceled print job.

The SpeedJet's graphics skills are mighty attractive. But if you're picky about text quality and you want a printer that's easy to use, the Canon is a better deal.

Epson Stylus 800



VITAL STATISTICS

Estimated street price: $350
PROS: Excellent output, scalable fonts
CONS: Paper-handling problems, relatively expensive
Contact: Epson, 800/289-3776, 310/782-0770
Reader service no. 604

Epson knows printers. The company has long ruled the dot matrix market, and it's won two *PC World* Best Buys for its personal lasers. No wonder the $350 Stylus 800 impressed us.

The Stylus 800 received the best overall score for text and graphics. Type is sharp and readable, whether printed at 6 or 127 points. And line art and scanned photos printed almost flawlessly, without requiring that we fiddle with the driver's darkness or contrast settings.

Like the Lexmark, the Stylus comes with DOS drivers on disk, plus built-in scalable fonts—good news for non-Windows users. While installing the ink cartridge is a little tricky, the Epson is otherwise easy to get up and printing, and its front panel is nicely straightforward.

Unfortunately, the Stylus chewed up paper like it was on a high-fiber diet. It suffered frequent misfeeds and jams when printing on plain paper and was even fussier when it came to transparencies and labels. Considering these problems and the printer's high price tag, the Epson falls a bit short of the mark set by the Canon. But if you want high-quality output and don't mind some paper hassles, the Stylus is a great choice.

Hewlett-Packard DeskJet 500

VITAL STATISTICS

Estimated street price: $300
PROS: Easy to use, good paper handling, three-year warranty
CONS: Mediocre output, relatively large
Contact: Hewlett-Packard, 800/752-0900
Reader service no. 605

Every couple of years, HP releases a new version of the DeskJet and sets a new standard for ink jet printers. So no review of desktop

PC WORLD TEST CENTER REPORT

Ink Jet Speed? They're No Lasers

	Excel 4.0	Word for Windows 2.0	WordPerfect 5.1 for DOS	PageMaker 4.0
Texas Instruments microMarc	:29	:23	1:27	:54
C. Itoh ProWriter SpeedJet CJ-300	:28	:27	1:40	:56
Canon BJ-200*	:30	:24	1:30	1:17
NEC Jetmate 1000	:31	:27	1:27	1:09
Lexmark ExecJet II	:35	:23	1:53	1:28
Hewlett-Packard DeskJet 500	:37	:24	1:50	1:18
Epson Stylus 800	:36	:26	3:07	1:24
Brother HJ-400	:44	:36	2:37	1:27

*Best Buy

Printers are arranged in order of overall speed, from fastest at top to slowest at bottom. Test results are in minutes:seconds, measured from the time we issued the Print command to the time the completed page ejected from the printer.

Methodology
All printers were tested as configured by the vendor. Unless otherwise noted in text, we used the recommended drivers that shipped with the printer.

Each test was run twice on each printer. The first test was run right after the printer was turned on, before anything else was printed. The same test was then repeated to measure benefits from font and other types of caching. Scores are the average of both tests.

Excel 4.0
We printed a simple one-page spreadsheet file.

Word for Windows 2.0
We printed a single-page business letter.

WordPerfect 5.1 for DOS
We printed a three-page text document. The score is the total for all three pages.

PageMaker 4.0
We printed a text page in landscape orientation, with three columns of text, a black bar with reversed text, and a halftone image.

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

ink jets would be complete without the current standard—the $300 DeskJet 500. The problem is, the 500 has been around so long that other vendors have had a chance to catch up with it.

Once considered petite, the 14-pound DeskJet is the bulkiest printer in the roundup. Fortunately, HP's control panel is still a model of simplicity. The printer generally handled paper like a pro, though you have to feed envelopes by hand and it won't accept transparencies.

The HP faltered more seriously on print quality. Text sometimes appeared fuzzy due to ink splatter, reversed type (white on black) was barely readable, and graphics were occasionally marred by horizontal white streaks. On the bright side, the DeskJet survived the greasy digit test with barely a smear.

While still a decent value, the DeskJet 500 is overdue for an overhaul. Don't be surprised if a spiffier model comes out later this year. If we were set on buying an HP, we'd wait until then.

Lexmark ExecJet II

VITAL STATISTICS

Estimated street price: $299
PROS: Excellent design, good paper handling, scalable fonts
CONS: Blurry text and streaky graphics
Contact: Lexmark Int'l Inc., 800/358-5835, 606/232-2000
Reader service no. 606

In a perfect world, all personal printers would be designed as well as Lexmark's $299 ExecJet II. This toaster-oven–size printer is truly a plug-and-print machine.

Lexmark's intelligent design starts with a DOS-based utility that installs drivers for applications it finds on the hard disk. The ExecJet's clever front panel is clear and informative, with buttons for controlling fonts and page orientation placed under a flip-up panel.

The ExecJet offers 12 built-in scalable fonts and lets you add up to 1MB of flash memory for storing more typefaces. Paper handling is also impressive: An easy-to-fill sheet feeder holds 150 pages—the most of any printer in this review—and 15 envelopes.

Unfortunately, the nice design isn't reflected in the ExecJet's output quality. A black-and-white scanned photo printed dark purple and was streaked with horizontal white lines. Text output was only slightly better—characters looked overinked and blurry, especially on letterhead. It's too bad, because the ExecJet is a printer truly designed with users in mind. If the output looked better, it would be an easy Best Buy.

NEC Jetmate 1000

VITAL STATISTICS

Estimated street price: $299
PROS: Excellent graphics, 24 built-in fonts
CONS: Inconsistent text output, poor telephone support
Contact: NEC Technologies, 800/632-4636, 508/264-8000
Reader service no. 607

NEC's Jetmate 1000 may be a dead ringer for the C. Itoh and Texas Instruments printers, but this $299 unit has a personality all its own—or, to be accurate, *two* personalities.

The split personality showed up in the output; like the microMarc and C. Itoh, it excelled at graphics but had trouble with text. Solid black areas printed without overinking and reversed type was crisp. But on text jobs, the printhead sometimes seemed to jog sideways in the middle of each line, giving the page a wavering, heat-mirage effect.

NEC's customer support is equally schizophrenic. We like the company's two-year warranty, toll-free number, and long support hours. But to get a human being on the phone we had to call three times—spending a total of 40 minutes on hold.

Still, the Jetmate boasts features such as 24 bit-mapped fonts and 20 Windows TrueType fonts on disk. It does a fine job with envelopes and suffered nary a paper jam. Unfortunately, it's just a little too inconsistent for our tastes.

Texas Instruments microMarc

VITAL STATISTICS

Estimated street price: $289
PROS: Fastest in review, excellent graphics
CONS: Printing errors
Contact: Texas Instruments, 800/527-3500
Reader service no. 608

Stop us if you think you've heard this one before: Texas Instruments' $289 microMarc shares some of the benefits and many of the liabilities of its NEC and C-Tech Electronics kin.

The microMarc's biggest benefits are speed and high-quality images. It received our judges' highest scores for printing scanned photos, and it was the fastest printer overall. Unfortunately, the microMarc also produces the wavy characters that bedevil the text output of the NEC Jetmate and C. Itoh SpeedJet.

In a perfect world, all personal printers would be designed as well as Lexmark's $299 ExecJet II. This printer is truly a plug-and-print machine.

We encountered some familiar problems with the microMarc—ASCII characters strung across the top of some pages, for example—as well as a few new glitches all its own. We were unable to print an envelope and experienced difficulty when printing PageMaker 4.0 text and graphics using the Texas Instruments–supplied Windows printer driver (we had to install a DeskJet 500 driver).

The Texas Instruments microMarc topped our judges' lists for printing scanned photos, and it was the fastest printer overall.

In other words, the microMarc involves some work. If you want fast and good-looking graphics output, this printer could be your cup of ink. Just be sure to keep the manual close at hand.

FEATURES COMPARISON

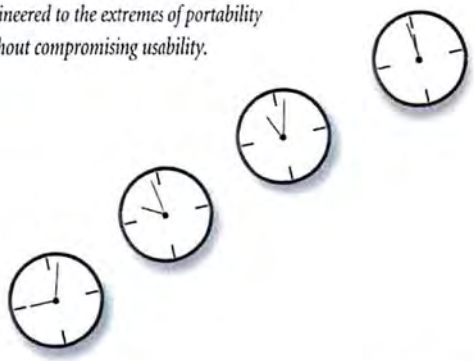
Near-Laser Quality at a Fraction of the Price

● Yes
○ No
n/a = not applicable

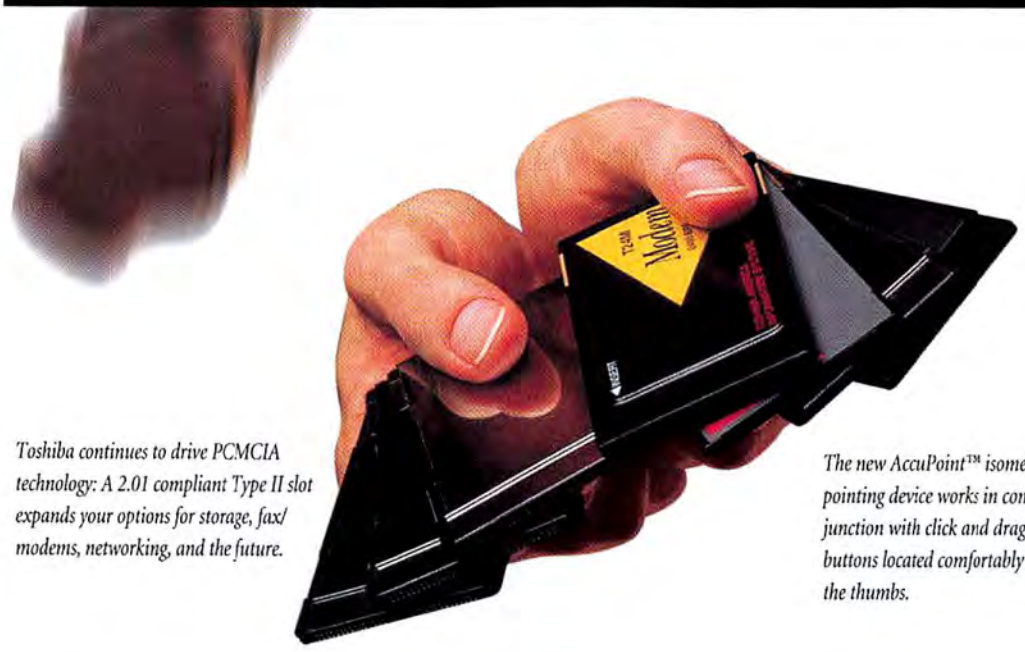
	Brother HJ-400	BEST BUY Canon BJ-200	C. Itoh ProWriter CJ-300 SpeedJet	Epson Stylus 800	Hewlett-Packard DeskJet 500	Lexmark Execjet II	NEC Jetmate 1000	Texas Instruments microMarc
Standard features								
Estimated street price	$299	$275	$329	$350	$300	$299	$299	$289
Estimated cost per page [1]	$0.02	$0.02	$0.04	$0.03	$0.04	$0.03	$0.03	$0.02
Maximum resolution (dpi)	360	360	300	360	300	300	300	300
Rated speed in draft/letter quality mode (characters per second)	110/110	248/173	300/300	n/a / 180	240/120	360/200	300/300	300/300
Standard memory (K)	64	49	16	8 [2]	16	21	128	24
Fonts and emulations								
Internal fonts (bit-mapped/scalable)	12/0	7/0	4/0	5/4	4/0	2/12	24/0	12/0
Font cartridge slots	0	0	2	0	2	0 [3]	2	2
Emulates HP DeskJet series	○	○	●	○	●	●	●	●
Ships with drivers for								
Windows 3.1	●	●	●	●	●	●	●	●
WordPerfect 5.1 and 6.0 (DOS)	○ [4]	○ [4]	○	●	●	●	○	●
Lotus 1-2-3 2.x and 3.x (DOS)	○	○ [4]	○	●	○ [4]	●	○	●
Design and paper handling								
Footprint (square inches)	174	104	204	175	256	159	204	204
Weight (pounds)	8.6	6.6	12.1	11	14.3	11	12.1	12.1
Reset button	●	○	●	●	●	●	●	●
Incoming data indicator	●	○	●	●	●	●	●	●
Paper-out indicator	○	○	○	●	○	●	○	○
Low-ink indicator	○	○	○	●	○	●	○	○
Serial port	●	○	○ [4]	○	●	○ [4]	○ [4]	○
Standard input capacity (sheets)	100	100	100	100	100	150	100	100
Maximum output tray capacity (sheets)	20	100	20	30	50	75	20	20
Prints transparencies and labels	●	●	●	●	○	●	●	○ [5]
Service and support								
Warranty (years)	2	2	2	2	3	2	2	1
Toll-free tech support	●	●	●	●	○	○ [6]	●	●
Daily support hours (weekdays)	9	11	8	12	11	9	12	12
On-site service	○ [4]	○	○	○	○	○	○	○
Average turnaround on repairs (days) [1]	2	none	10	2	1	1	1	2
Fax/BBS support	●	●	●	●	●	●	○ [7]	●

[1] According to vendor.
[2] Upgrade to 32K available.
[3] Optional flash RAM available for storing fonts.
[4] Optional.
[5] Transparencies only.
[6] Call-back service.
[7] BBS only.

Compact and lightweight —less than 4.4 lbs. The Portégé T3400CT has been engineered to the extremes of portability without compromising usability.



FINALLY, COMPUTER SCIENCE EMBRACES THE LAWS OF MOTION.



Toshiba continues to drive PCMCIA technology: A 2.01 compliant Type II slot expands your options for storage, fax/modems, networking, and the future.

The new AccuPoint™ isometric pointing device works in conjunction with click and drag buttons located comfortably beneath the thumbs.

INTRODUCING THE NEW ULTRAPORTABLE PORTÉGÉ.

Toshiba engineers haven't just redesigned the portable computer, they've reinvented it: The Portégé™ T3400 Series. Never before has a computer so perfectly balanced mass and speed.

Now you can travel with a system smaller than a notebook, yet graced with the feel of a full-size system. Portégé is driven by the full force of an i486™ SX/33 processor, and shines with Toshiba's renowned color active matrix or high-contrast backlit monochrome displays. Toshiba designers have even created the optional Port Replicator for simple, single-point connection to your desktop environment. See how far Toshiba has taken every aspect of portable computing. And think where it can take you.

PORTÉGÉ

Call 1-800-457-7777 for the dealer nearest you.

intel inside

THE SHAPE OF THINGS TO GO.℠

Toshiba discovers the secret to longer life: The ultra-lightweight Li-Ion battery, with up to 8 hours of battery life, is the ultimate in power-per-ounce.

T3400CT
- 7.8" color TFT-LCD active matrix display—256 color SVGA
- 7.9" x 9.9" x 1.8"
- 4.4 lbs.

T3400
- 8.4" STN monochrome display
- 7.9" x 9.9" x 1.7"
- 4.1 lbs.

Both Models
- 33MHz SL Enhanced i486™SX
- 120MB HD
- 4MB RAM (expandable to 20MB)
- Lithium-Ion battery
- Type II (5mm) PCMCIA 2.01 slot
- AccuPoint™ integrated pointing device
- Integrated BitBLT graphics accelerator
- VL-local bus video
- Ports: serial, parallel, FDD, Port replicator, and VGA adapter
- Windows™ 3.1, DOS™ 6.0, CommWorks™ for Windows

3 YEAR LIMITED WARRANTY

In Touch with Tomorrow

TOSHIBA

© 1993 Toshiba America Information Systems, Inc. All products indicated by trademark symbols are trademarked and/or registered by their respective companies.

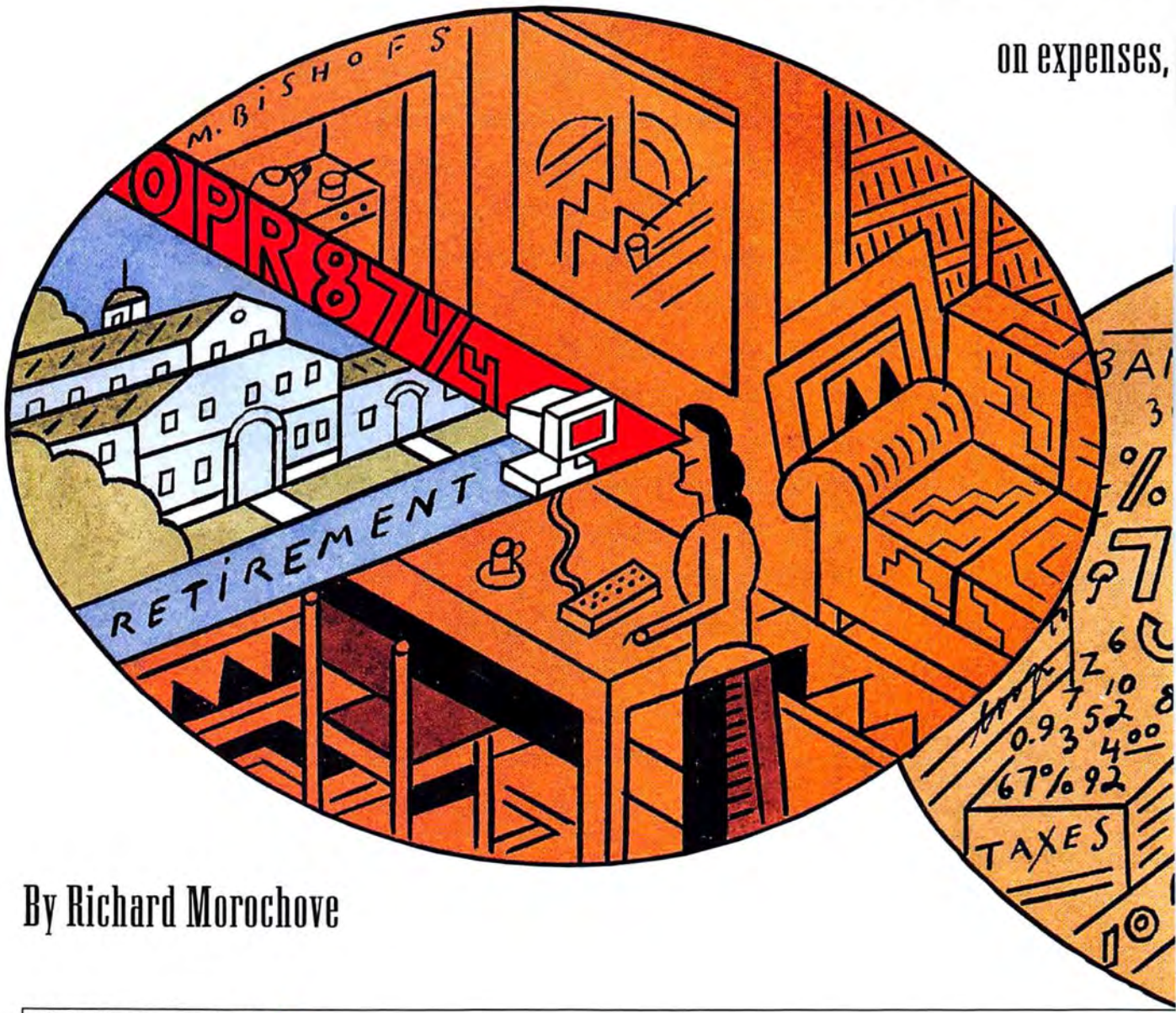
Circle 228 on reader service card

Sound Investments

Personal Finance

Want to get rich quick? These

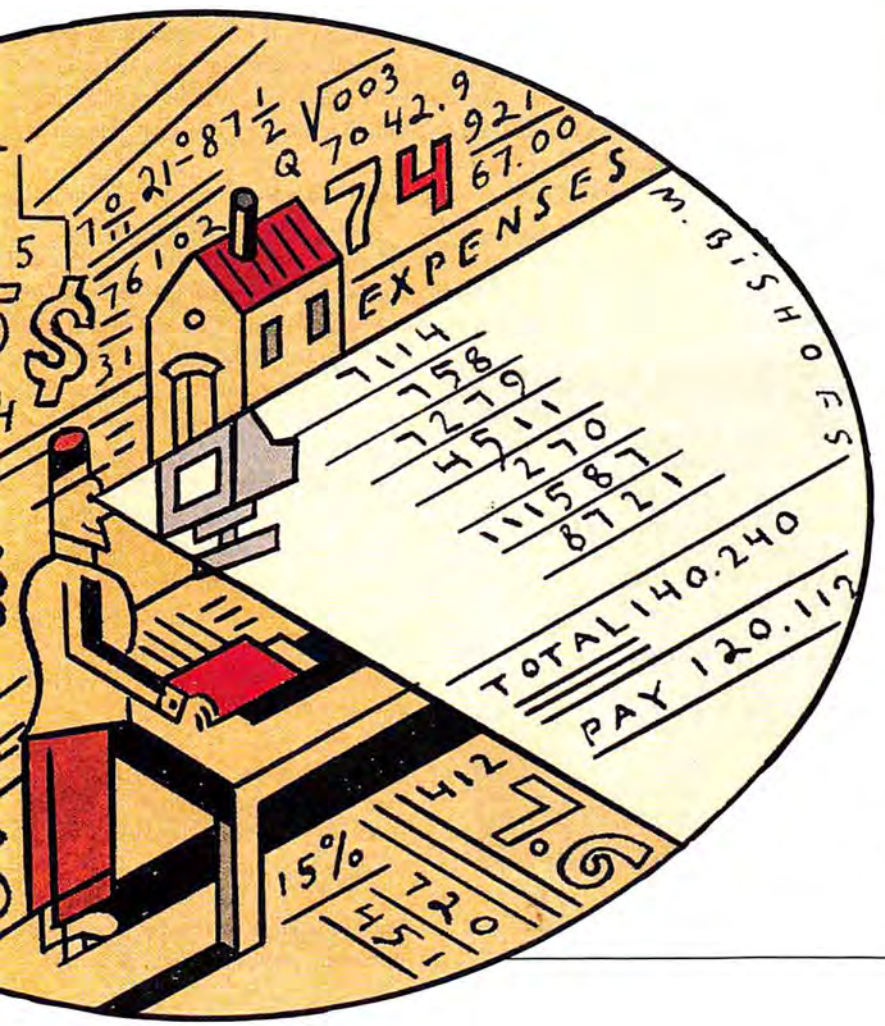
on expenses,



By Richard Morochove

Software

seven packages don't promise that, but they will help you keep tabs manage investments, and plan for college, retirement, and other financial goals.



MARIS BISHOFS

Quick: What's your checking account balance? Where does all your money go each month? If, like most people, you don't know for sure until your bank statement arrives, personal finance software can help you keep tabs on your money.

The new crop of programs makes it easier than ever to track your finances, print checks, and reconcile your checkbook records with your bank statement. Even better, these programs provide more insight into your expenses than a traditional manual system ever could. You can set up a budget, for example, and then compare it against your actual expenses every month. Or you can get a jump on paying your taxes by having all your expenses categorized neatly by the end of the year.

Of the seven personal finance packages we look at in this article, five are for Windows and two are for DOS. All of these packages are reasonably priced at under $80, and all handle the basics of tracking expenses, reconciling accounts, and printing checks. Basic packages such as WinCheck limit themselves to these activities. At the

other end of the spectrum are packages such as Managing Your Money, which also include the capabilities to manage, track, and help you increase your financial portfolio.

Paying Your Dues

All of the programs let you print checks. Since you probably write a group of checks to the same merchants every month, this feature will save you time, once you enter basic payment data. However, you'll need special check forms for your printer, and it pays to shop around. For cost-comparison details, see "A Consumer's Guide to Printed Checks." Even if you don't want to print your checks, a personal finance program can offer a quick way to track your bank balance. Alternatively, you can pay bills without even using checks. Most of the programs offer links to electronic payment services such as CheckFree (see "Money on the Wire").

Analyzing Your Expenses

All of the programs here can track your bills, but the capability to analyze your spending patterns is another story. Better programs let you compare this year's expenses with last year's, as well as against a preset budget you provide, so you can see where spending is out of whack. Microsoft Money and Quicken make it easier to create a budget by using your historical spending patterns as a guide.

One of your biggest expenses is the one you settle every spring—your income taxes. It's important that a package allows you to identify which expenses are deductible. Some personal finance programs, such as Managing Your Money, even give you a fair estimate of how much you'll pay. None actually prints a 1040 form you can sign and file, but all except WinCheck allow you to transfer accumulated data to an income tax program.

Managing Your Portfolio

Only four of the programs reviewed do a reasonable job of managing your financial assets. Simply Money, Managing Your Money, and both versions of Quicken offer portfolio management capabilities that help you track the costs, income, and current market values of your securities. Better programs keep track of the historical trends of securities prices, not just the most recent quote. If you own many different securities, using a facility to import current market prices from an online service is much less time-consuming than keying in prices from newspaper stock tables.

People who depend on the income from their investments will want to be able to measure the current yields from their securities. Probably the most important measurement is the return on investment, a calculation of the annualized return that includes dividend and interest income, as well as any unrealized capital gains. Simply Money, Managing Your Money, and both versions of Quicken provide this capability.

Planning Your Future

Financial planning involves making the right decisions today so you can achieve your financial goals. Will you have enough spare cash to take that European vacation? Will you have enough money to retire in style? Is your financial net worth sufficient to start a new business?

Only two programs, Simply Money and Managing Your Money, come right out and give you financial advice, letting you know if you're on the right track or if you're neglecting some important financial considerations. Simply Money's financial adviser is a standout with its pop-up comments that are triggered as you complete key actions. But only Managing Your Money does a thorough job in this area because it also estimates future cash flow and net worth.

Buying Advice

Is there one personal finance program that has it all? Unfortunately, no. Both the DOS and Windows versions of Quicken are our Best Buys for managing your checkbook because they make it so easy. The Windows version features a few more capabilities and an easier-to-navigate graphical interface. But even with the improved portfolio management capabilities in these latest versions, Quicken stumbles when it comes to managing your financial assets.

Venerable, DOS-based Managing Your Money may look like it just escaped from the Jurassic Park for software, but it does an outstanding job of managing your assets and giving you financial advice. It's our Best Buy for managing your portfolio. But this isn't an easy program to learn; the archaic menu interface won't win many fans. A Windows version is in the works and will help make this powerhouse more approachable. If you need just the basics, look no further than WinCheck. It handles only your checkbook, but it's good at what it does.

None of these packages is suitable for full business use. If you need a small-business accounting program, take a look at "Point-and-Click Accounting Software" (*PC World*, October 1992) for information about some of the best packages in that category.

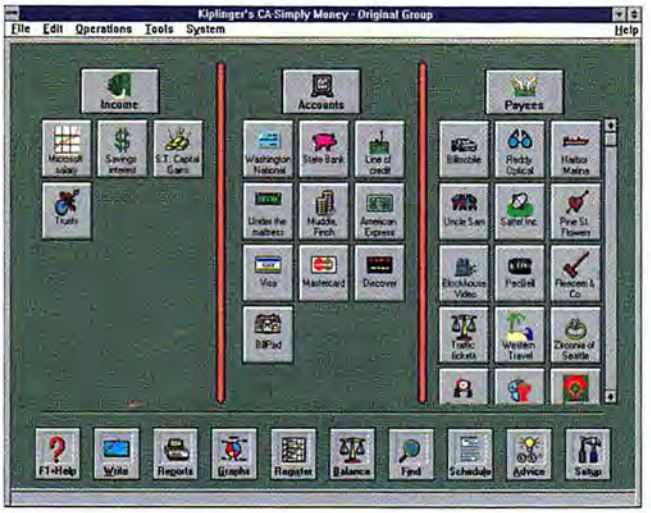
Richard Morochove is a chartered accountant and president of Morochove & Associates, a Toronto consulting firm specializing in financial applications.

For more information about all products in this article, circle reader service no. 901.

Best Buys

Both versions of Quicken clearly win our Best Buy for checkbook management and for tracking the basic flow of your money. They also excel at budgeting and depicting graphically what happens to your money. But the Quicken packages stumble when it comes to investment advice, an area in which they fail to provide guidance on how to manage your finances better. Here Managing Your Money picks up where Quicken leaves off and wins a Best Buy for portfolio management. Kiplinger's CA-Simply Money is also a solid program, but it doesn't quite match the Best Buys in these areas.

QUICKEN IS BEST for checkbook management; Managing Your Money excels at financial advice.



CUSTOMIZED ICONS REPRESENT different accounts and expenses in Kiplinger's CA-Simply Money.

Kiplinger's CA-Simply Money 3.1

PROS: Judicious advice on how to manage your money better, knockout visual design, speedy navigation

CONS: Modifying account and payee details is awkward

WINDOWS Kiplinger's CA-Simply Money doesn't need its big name to make a big impression. It's one of only two personal finance programs that provides advice on how to manage your money, and its excellent design makes navigation simple.

Right off the bat, you notice the stunning visuals. The program's icons are simply marvelous, including miniature representations of credit cards, boats, and, of course, money. You can select from more than 200 icons to represent your sources of income, expenses, and bank and credit card accounts visually. This makes it easy to find the right category or account at a glance.

Simply Money's beauty is more than skin deep. The program offers financial advice that is both context- and goal-sensitive. You specify your security goals, such as growth, high return, low risk, income, or a college fund. When you set up accounts or enter other information, you may trigger the adviser. One item, for example, discusses how to establish your investment goals. If you aren't able to read the advice immediately, you can close the window and review it at another time.

Simply Money is easy to learn and help is readily available. If you float the cursor over an icon button, a line of help appears at the bottom of your screen. However, a few operations could be more intuitive. For example, to change an address for a payee, you must enter the setup portion of the program. It would be handier if you could simply click on the payee's icon and modify it directly.

Simply Money's portfolio management isn't quite as sophisticated as Managing Your Money's. For example, you won't find asset allocation modeling, which recommends the mix of stocks, bonds, and other securities you should hold to maximize your return for a specific degree of risk. However, as a Windows program, it's a lot friendlier to use. Simply Money also doesn't go quite as far as a program such as Quicken in helping determine your financial projections—future cash flow, for instance.

Overall, it's an impressive debut, just a few features shy of the leading programs and moderately priced at $69.99. Its ease of use makes it particularly suitable for managing your financial assets if you don't need the heavy-duty power of Managing Your Money but you do require solid financial advice. *Computer Associates Int'l, 516/342-5224.* **Reader service no. 609**

Managing Your Money 10.0

PROS: Top-notch portfolio management

CONS: Complicated to use, complex DOS interface

Managing Your Money is an everything-but-the-kitchen-sink type of program that provides advice based on the philosophy of financial guru Andrew Tobias. In this latest version, which carries a list price of $79.95, Meca Software decided to throw in the sink. This approach makes the program a bit unwieldy, but if your primary need is managing your financial assets, Managing Your Money is our Best Buy.

The program is particularly strong in portfolio and investment management. For example, you get a sophisticated asset allocation module that selects a mix of securities types to help you achieve your desired rate of return. A new automated setup procedure guides you gently through the process of establishing a portfolio.

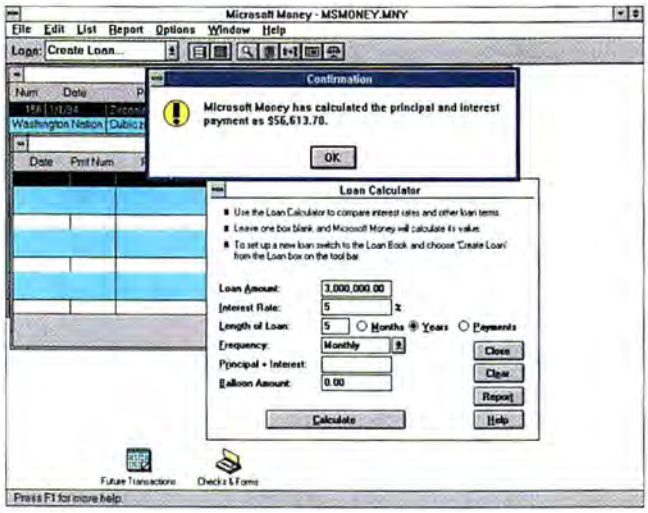
Another key new feature is a debt-reduction module that helps you prepare a strategy for paying off your loans as quickly as possible. (No, Andrew Tobias doesn't recommend bank robbery.)

Tobias's pithy online comments are useful, and they give Managing Your Money an idiosyncratic flair. He even dares to criticize several program features.

With all the menu options, though, it's tough to discern what's where. The online help isn't completely indexed, so you must either know or guess which section of the program includes a particular feature.

Furthermore, the menu interface of this DOS program is a relic of the eighties, and it operates inconsistently. For example, when you scroll through a list of pulldown menu options, you hit <Enter> to select the option. But when scrolling through a list of help options, <Enter> doesn't work; you must use <F10> instead. Thankfully,

IS BUYING IBM one of your financial goals? Managing Your Money lets you develop a what-if plan for investments.



MICROSOFT MONEY'S LOAN CALCULATOR lets you see if you can afford to take out that big loan.

Meca Software is working on a Windows version that should be available sometime this spring.

Managing Your Money has the most comprehensive tax planning module of the programs we reviewed. Most other packages limit their involvement to tracking tax-related spending categories and exporting a data file to an income tax program. Managing Your Money goes well beyond that with a 1040 worksheet that actually estimates your income taxes. But you still need a tax program such as Meca's TaxCut to print a return you can file.

Managing Your Money also offers some small-business features, including P&L statements, balance sheets, and the capability to print invoices. The Social Security estimator is a unique tool that lets you determine just how little Uncle Sam will give you to live on when you retire.

You can even use the program as a kind of personal management system. It tracks scheduled appointments, telephone calls, to-do lists, and so on. Managing Your Money's only weak spot is that you really have to work to use it. It doesn't make it easy to pay your bills like Quicken does. But if Managing Your Money's superior portfolio management is most important to you, it's your Best Buy. *Meca Software, 800/820-7457, 203/255-1441.* **Reader service no. 610**

Microsoft Money 2.0

PROS: None

CONS: Lacks portfolio management and financial planning capabilities

WINDOWS Microsoft Money does an adequate job of checkbook management, but it isn't anything special. It handles all the standard operations: printing checks to pay your bills and tracking expenses so you can see where your money went at the end of the month. Unfortunately, they're all "me, too" features, implemented without flair. Although Money handles little more than WinCheck, it's considerably more difficult to use.

Budgets are usually tedious to set up, but Money's automatic budgeting feature can create a budget based on your previous spending patterns. This feature is also available in other personal finance programs, such as Quicken.

Loan tracking is another improvement in version 2.0. A Loan Wizard guides you through the steps to set up a loan. This feature handles calculations for either borrowing from or lending to others. If the Loan Wizard only filled out the loan application, too.

Money has reasonable graphing capabilities to show you trends in your expenses. Reports can be customized and saved in their modified form for regeneration in subsequent months.

As for financial planning, Money is a washout. Moreover, if you have a securities portfolio, the program isn't able to keep track of the details of your trades.

Investment tracking has been added to version 3.0 of Money (due out this month). With 3.0, you'll be able to pay your bills and check your stocks online. Microsoft has also teamed up with three banks—U.S. Bank, Michigan National, and First Chicago—to offer online banking services in the new version.

Money isn't a bad personal finance program; it does a workmanlike job of tracking your expenses. But if you need just the checkbook basics, WinCheck is easier to learn, less expensive (at list price), and more economical because of its cheaper check forms. If you want full-featured bill-paying capabilities, you'll be happier with Quicken for Windows. Microsoft Money just doesn't stand out as a leader in any area, and it's not a bargain at its $69.95 list price. *Microsoft Corp., 800/426-9400.* **Reader service no. 611**

MoneyCounts for Windows 1.0a

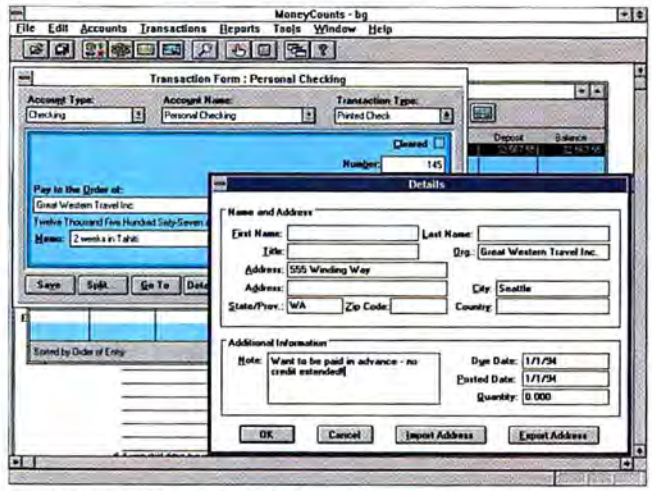
PROS: Good financial reports for home businesses

CONS: Uses jargon only an accountant could love

WINDOWS MoneyCounts for Windows tries to straddle the needs of two distinct users: home-business owners and individuals who just want to track their personal finances. That the program almost manages to pull it off is a tribute to MoneyCounts' developers.

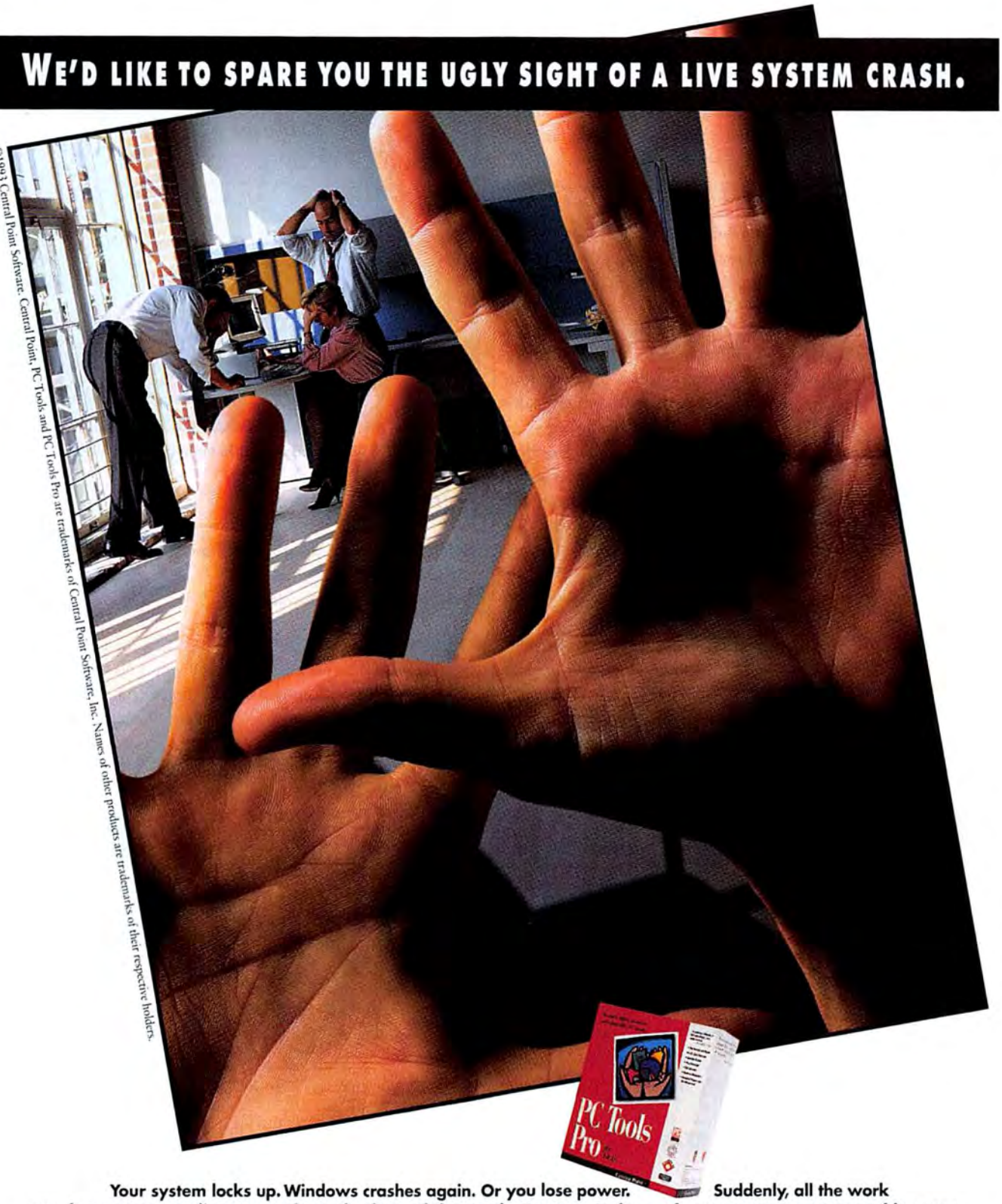
It's the only package here that comes set up for double-entry bookkeeping, the same system businesses use. However, you can turn off this option and revert to a simpler, single-entry method that better suits home users who aren't accountants.

MoneyCounts is one of the few packages that comes with business financial reports such as a general ledger and a trial balance.



MONEYCOUNTS' EXTRA NOTES FEATURE allows you to set reminders for each merchant you pay.

WE'D LIKE TO SPARE YOU THE UGLY SIGHT OF A LIVE SYSTEM CRASH.



©1993 Central Point Software. Central Point, PC Tools and PC Tools Pro are trademarks of Central Point Software, Inc. Names of other products are trademarks of their respective holders.

Your system locks up. Windows crashes again. Or you lose power. Suddenly, all the work you forgot to save disappears from the face of the earth. Forever. Unless, of course, you're protected by new PC Tools Pro for DOS. It has an ingenious new recovery feature called CPR, that can even bring back your unsaved work. (Norton Utilities can't.) PC Tools Pro also repairs and optimizes compressed drives and diagnoses the most elusive hardware problems. And protects you from all computer viruses known to man. (Norton won't.) It even lets you do automatic backup. (Norton doesn't.) But that's not all. For a more revealing comparison of PC Tools Pro vs. Norton, call FAXBACK at 1-800-847-8766 and ask for document 97529. For all upgrades, just call 1-800-277-3946.

UPGRADE FROM PC TOOLS, NORTON OR FASTBACK ONLY $49.95* 1-800-277-3946

*Upgrade from PC Tools, Norton Utilities, Fastback or XTree. Offer expires February 28, 1994. Offer good only in U.S. and Canada. Shipping and handling extra.

CENTRAL POINT

Circle 52 on reader service card

However, it can't prepare other key business documents, such as invoices or customer statements.

This program won't help you manage your personal financial assets, such as stocks and bonds, nor will it assist in planning your financial future. However, it does have a better-than-average income tax section, including a facsimile 1040 that links to the company's Tax at a Glance program.

To prepare a bill payment, you fill in the familiar check facsimile on screen. Unfortunately, for a deposit, a credit card payment, or any other transaction, you fill in a form that looks like a check, which I found somewhat disconcerting. You'd think a visually oriented package could be a bit more creative in its design of screen forms.

The biggest knock against MoneyCounts is its use of accounting terminology, such as "posting to an account." This is consistent with full-fledged business accounting software but will confuse many individuals who have no desire to bone up on accounting jargon.

If you're starting a home business, MoneyCounts could provide a nice way to track your financial records. However, a business of any size will soon outgrow its limited capabilities. It will quickly get tedious using your word processor to prepare invoices for your customers, for example, and this capability should be part of an accounting program. For personal use, it's suitable for paying your bills and estimating your income taxes, but it lacks the facility to manage your financial assets properly.

At $49, MoneyCounts is perfect for a very specific market: the small businessperson who pays a lot of expenses, doesn't prepare many sales invoices, and doesn't need to track assets. These circumstances may be common in budding businesses today, but they don't match the aims of most business owners. *Parsons Technology, 800/223-6925, 319/395-9626.* **Reader service no. 612**

SCREEN FORMS IN QUICKEN FOR DOS make preparing checks a snap.

Quicken for DOS 7.0

PROS: Almost-automatic bill payments, financial planning calculators help you reach savings goals

CONS: Doesn't provide financial advice

The newest incarnation of Quicken for DOS makes it easier than ever for you to pay your bills. You now have two different options for creating checks, for example, or you can even choose to avoid them altogether by paying merchants electronically.

Tracking expenses is easier with a new service that allows you to

A Consumer's Guide to Printed Checks

Personal finance software is cheap; it's the checks that can be expensive, and they must be compatible with your software. Most personal finance software packages include order forms so you can buy compatible check forms from an approved printer. The approved printers, however, don't always offer the best deals.

We priced a starter kit of forms that included 500 tractor-feed checks for dot matrix printers and 250 double-window envelopes, which is about a two-year supply. Prices ranged from $70.40 for WinCheck to $117.90 for Kiplinger's CA-Simply Money. The double-window envelopes display your preprinted name and address at the top; the merchant name and address fit in the lower, main window. (You probably won't need as many envelopes as checks because many merchants supply their own return envelopes, which you can use instead.)

If you need a duplicate of the check, an attached descriptive voucher stub, or sheet-fed checks for a laser printer, the check forms will most likely cost more.

Approved printers don't always offer the best deals on check forms. Shopping around can save you a considerable amount of money.

It pays to look into prices from other printers such as New England Business Service (800/999-9394); you may be able to find a better deal than the one that is offered through your personal finance package.

Your bank will accept virtually any computer check, but make sure check forms ordered from "nonapproved" printers are compatible with your software. Most programs don't allow you to adjust their check-printing templates to fit just any old check.

One notable exception is WinCheck, which allows you to customize on-screen check forms that print on any form. It's probably not coincidental that WinCheck offers the lowest price for a starter kit of check forms.

Since laser printers print only when a full page is complete, I recommend buying laser checks that come one to a sheet. Three-to-a-sheet laser checks allow you to print checks only in multiples of three, so if you use them, resign yourself to an incomplete number sequence in your check register when you destroy the odd-number check.

For today's best jobs, you need high-tech training...

Get the new skills you need for a high-paying career in computer programming!

Only NRI at-home training gives you real-world programming skills in *three* in-demand languages: QBasic, C, and Visual Basic, today's hot new language designed for writing popular Windows applications. Best of all, you get hands-on training with a powerful 486sx-based computer system, complete with Super VGA color monitor, 200 meg hard drive, Windows, and professional programming software you keep!

▶ NRI, the leader in at-home computer training, shows you how to take advantage of today's newest programming opportunities

Get in on the ground floor of computer programming, one of today's fastest-growing career fields. The Bureau of Labor Statistics forecasts that job opportunities for programmers will increase *much* faster than average over the next 10 years, with as many as 400,000 *new* jobs opening up by 2005.

And the fastest-growing segment of programming jobs will be PC programming, fueled by the phenomenal popularity of Windows and the rise of exciting new languages such as QBasic, C, and Visual Basic.

Now, with NRI at-home training, you can get the new skills you need to build a top-paying career — even a full- or part-time business of your own — in this high-growth, high-opportunity field.

▶ Get hands-on experience with today's programming tools: a powerful 486sx-based computer, Windows, Visual Basic, and more —all yours to keep!

Right from the start, NRI gets you actively involved in the challenge of real-world programming. Step by step, you learn to create the kinds of full-featured, powerful programs today's employers and clients demand... including programs designed for use in a Windows environment!

Only NRI gives you first-hand programming experience with a state-of-the-art, Intel-based 486sx computer system, complete with Super VGA color monitor, 200 meg hard disk drive, a full megabyte of RAM, 3.5 inch floppy drive, mouse, and more — all yours to train with and keep!

Plus you explore the extraordinary capabilities of *three* in-demand programming languages. You learn to design, code, run, debug, and document programs in QBASIC, C, and Visual Basic. Best of all, since Visual Basic is specifically designed for creating Windows applications, you learn to generate fully functioning Windows programs, complete with text boxes, command buttons, and other sophisticated graphical interface elements.

▶ No previous experience necessary

Train with NRI, and immediately start getting the money-making job skills you need to be a computer programmer — no matter what your previous background.

NRI's step-by-step lessons and hands-on programming projects help you first master the programming design concepts used every day by successful PC programmers. With your experienced NRI instructor on call and ready to help, you go on to learn programming in three of today's hottest languages.

By the time you complete your course, you have a clear understanding of programming methods, languages, and techniques...and you're ready to handle any programming task with confidence.

See other side for highlights of your NRI hands-on training in computer programming

SEND CARD TODAY FOR FREE NRI CATALOG

NRI Schools
McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW, Washington, DC 20008

For career courses approved under GI Bill, ☐ check for details

YES! Send me the FREE catalog I've checked and show me how NRI can give me the skills and confidence to earn good money in an exciting new career or business of my own.

✓ Check one FREE catalog only

- ☐ **Computer Programming**
- ☐ PC Applications Specialist
- ☐ Programming in C++ with Windows

Other Computer Career Courses

- ☐ Microcomputer Servicing
- ☐ Database Management
- ☐ Bookkeeping and Accounting
- ☐ Multimedia Specialist

Name (please print) Age

Address

City State Zip

Accredited Member, National Home Study Council

5497-0194

Learn computer programming as you train with the latest programming tools… a 486sx-based computer system, Windows, Visual Basic, and more!

"I couldn't believe NRI gives you a computer, loads of reference material, and professional software. The course has taken my knowledge of computers and my self-confidence to new levels!"

Rob A. Chappa, *NRI Student*

Here's what makes your 486sx mini-tower computer system the ideal programming tool:

- Full IBM PC/AT-compatibility
- High-speed Intel 80486sx CPU with 25 MHz clock
- 200 megabyte hard disk drive
- 1 meg RAM installed, plus 4 meg additional RAM; 64K ROM
- Windows graphical interface
- NEW! 14" Super VGA color monitor with tilt-swivel base
- High-density 3.5 inch floppy disk drive
- DOS operating system with QBasic interpreter
- Professional compilers for programming in C and Visual Basic

▶ Now, as never before, you can succeed as a computer programmer

NRI at-home training gives you everything you need to build a high-paying career as a computer programmer. Designed around a state-of-the-art 486sx computer system, your training guides you smoothly from fundamental principles through coding in three of today's most widely used computer languages: QBasic, C, and Visual Basic, the language designed exclusively for programming in a Windows environment. With NRI, you get the hands-on experience and the confidence it takes to master today's programming challenges. And, by creating and running your own full-length programs, you build skills you'll be proud to show any prospective employer or client.

▶ Send today for your FREE catalog

Prepare now for a high-paying career as a computer programmer! See how NRI at-home training in Computer Programming gives you the experience and the know-how, the computer and the software you need to get a fast start in this top-growth field. Send today for your FREE catalog.

If the card is missing, write to us at NRI Schools, McGraw-Hill Continuing Education Center, 4401 Connecticut Avenue, NW, Washington, DC 20008.

IBM PC/AT is a registered trademark of the IBM Corporation. Windows, QBasic, and Visual Basic are trademarks of Microsoft Corporation. Intel Inside logo is a registered trademark of Intel, Inc.

Card 72

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 10008 WASHINGTON, D.C.

POSTAGE WILL BE PAID BY ADDRESSEE

NRI Schools

McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20078-3543

receive detailed credit card statements via modem or disk.

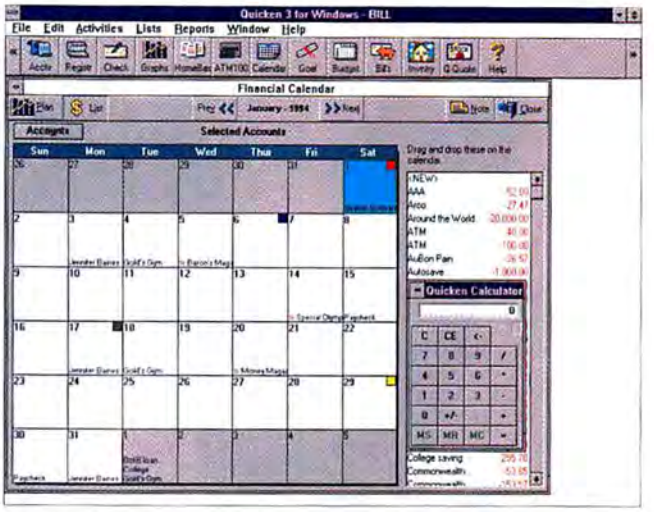
Quicken makes it so easy to pay your bills, track your expenses, budget your income, and graph the results that it earned a Best Buy for checkbook management.

A key new feature is a financial calendar that lets you schedule bill payments. You can select from among the bills you pay regularly, assign them to specific dates, and pay them at intervals. Quicken gives you the option of creating the check entry automatically or just reminding you when the payment is due.

The financial planning calculators and portfolio management enhancements in the latest release make it easier to manage your financial assets. However, Quicken still lacks the asset management depth of Managing Your Money. For example, Quicken won't perform a detailed analysis of a rental property to calculate its projected rate of return.

Quicken lets you select from seven portfolio views showing your holdings; investment performance, including percentage ROI (return on investment); current valuation; and latest pricing changes. The program has five financial planners you can use for calculating loans, savings goals, a college education fund, a retirement nest egg, and for refinancing existing obligations. Each planner is flexible. For example, the loan planner calculates either the payment for a given loan or determines the principal amount of the loan you can afford with a stated periodic payment. This lets you see how large a mortgage you can take out if you can afford to pay $1500 a month, for instance.

Quicken's already good online help has been improved. Qcards offer automatic online help if you linger too long without acting, and Coaches offer shortcut tips. You also have a comprehensive tutorial for learning the program and the usual context-sensitive online help. If you're still firmly wedded to DOS computing, this bill-paying program is as good as it gets. Otherwise, you might want to consider switching to the even more capable Windows version. *Intuit, 800/624-8742, 415/322-0573.*



QUICKEN FOR WINDOWS' NEW FINANCIAL CALENDAR lets you drag previous payment items and drop them on their scheduled due dates.

Quicken for Windows 3.0

PROS: Almost-automatic bill payments, financial calendar shows future payments at a glance

CONS: Doesn't provide financial advice

WINDOWS Quicken for Windows is a Best Buy for managing your checkbook and for tracking the basic flow of your money. Like the DOS version of the program, Quicken for Windows makes it easy to pay your bills and track expenses according to your budget. But the Windows version offers more features and is easier to use.

Even with its improved portfolio management capabilities, however, Quicken falls a little short of the high standard for managing your financial assets established by Manag- **continued on page 218**

Money on the Wire

Want to pay without paper? Most of the packages we reviewed (except for MoneyCounts and WinCheck) offer electronic bill-paying through BillPay USA, a service on Prodigy, or CheckFree. These services let you pay your bills electronically.

To use CheckFree, for example, you simply enter payments into Quicken or Managing Your Money as usual; the software then creates payment information and sends it via your modem to the CheckFree processing center. A few days before the payment due date, the service charges your bank account automatically and transfers the funds to the supplier.

CheckFree pays some merchants electronically using the Federal Reserve network, the same network banks use to transfer funds. Merchants who don't accept electronic transactions are paid with a laser-printed check, prepared and mailed by CheckFree.

A subscription to the CheckFree service costs $9.95 per month and covers up to 20 payments. Additional payments cost $3.50 for each block of ten. BillPay USA, which you can use with Simply Money, Managing Your Money, and Microsoft Money, costs $9.95 for 30 payments; extra payments are $3.50 per block of ten. The first month is free. To access BillPay, you also have to pay $14.95 a month to connect to Prodigy.

The paperless office is a step closer with new services that allow you to pay your bills electronically via personal finance software.

Considering what you'll save in postage, check forms, and envelopes, either BillPay or CheckFree is a sweet deal. But make sure the merchants you buy from regularly are equipped to accept electronic payments. If they aren't, they'll still receive your payment by check, but the service may not be worth setting up.

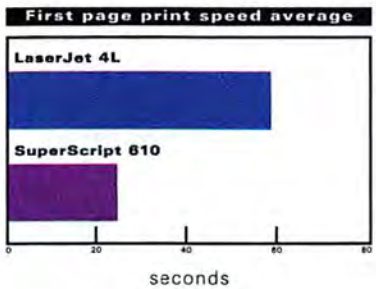
Wai
sec

If you have to wait much longer to print, you need

You see, the NEC Silentwriter SuperScript 610 is the only laser printer that begins printing the second you press "Print." So you don't have to wait. And the only laser printer with a first page print speed that's three times faster than the HP® LaserJet® 4L.

The first Windows™ printer.

In fact, the SuperScript 610 is a whole new way of printing. It's the first personal laser printer that gets its processing power directly from Windows and your PC. That means it's as upgradable as your PC. So as your PC gets faster, so does your printer. In fact, this printer prints exactly what you see on your screen. Fonts, DOS applications, everything. And at less than $700 it's an even better value than you thought.

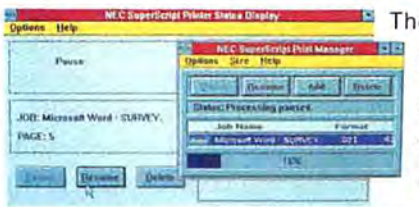


Based on 486-66 MHz PC with 8MB RAM. Average speed based on printing one-page documents from word processing, spreadsheet, presentation and graphics applications. The Energy Star emblem does not represent EPA endorsement of any product or service. Silentwriter is a registered trademark of NEC Corporation and SuperScript and FastFacts are trademarks of NEC Technologies, Inc. All other trademarks are property of their respective owners. © 1993 NEC Technologies, Inc. NEC GSA# GS00K91AGS5241.

it a ond.

a Silentwriter® SuperScript™ 610.

See what's happening, while it's happening.



The SuperScript 610 even sends an on-screen status display to your PC that tells you exactly what's going on. So screaming, cursing and kicking your printer are no longer necessary.

And it comes with a 2-year replacement warranty. So, if by some remote chance your Silentwriter 610 runs into bigger problems than an empty paper tray, have no fear.

We'll get you a new one overnight. If you can wait that long.

For more information on this exciting new technology, call 1-800-NEC-INFO. Or via fax, call NEC FastFacts™ at 1-800-366-0476. Request document #SW610.

NEC

Circle 205 on reader service card

Two w
make a

If patience is a virtue, it would be tough to find anyone more virtuous than a 386 user.

Of course, you're not waiting to be canonized. You just want to get your spreadsheet crunched, printed and e-mailed before your boss's boss calls you looking for it.

Performance Benchmarks		
(figures indicate relative performance)	**Intel i386**	**Cyrix 486 Upgrade**
MS Excel 3.0	1.0x	2.1x
MS Word 2.0	1.0x	2.8x
Micrografx Designer 3.1	1.0x	2.6x
Benchmark tests run on IBM PS/2 Model 70/20MHz		

The new Cyrix 386-to-486 Upgrade Microprocessor delivers application performance that's twice as fast. And that's twice as smart.

Now if you had a 486, you wouldn't have this problem. But all that wishful thinking goes out the window when you consider the double-knots on your company's purse strings.

Fortunately, there's a smarter alternative to the downward migration path pictured above. It's called the 386-to-486 Upgrade Microprocessor.™ And it's only available from Cyrix,® the smarter microprocessor company.

It's smarter because it's the only single-chip upgrade solution of its kind. And as such, the most cost-conscious way to replace the pedestrian 386 computer you have, with the searing 486 power you want.

Our upgrade chip acts just like a 486, and with good reason. It has Clock Doubling, a 1K on-chip cache

© 1993 Cyrix Corporation. Cyrix is a registered trademark, and Cyrix instead is a trademark of Cyrix Corporation.

ays to 386 fly.

Now available for 386SX models!

and enhanced Cx486 technology. Which means it delivers *twice* the application performance, and 100 percent compatibility with all your software. Like DOS, Windows and OS/2. Even Windows NT. It's also certified software compatible in Novell, Banyan and Lan Manager nodes.

MICROSOFT WINDOWS COMPATIBLE

yes It runs with NetWare

Here's how to get an instant 486. Just use the chip removal tool provided to pull out your 386DX chip (16, 20, and 25 MHz versions), and plug our Cyrix Upgrade Microprocessor into the empty socket. Installing the SX version is even easier. It just clips on over the existing chip.

What's more, it's easy to install (it takes all of 15 minutes), and costs under $400. So it's also easy to justify to even the stingiest bean counters.

Every Cyrix upgrade chip comes with the reassurance of a limited lifetime warranty, toll-free telephone support, and a money-back guarantee.

So do the smart thing. Call any dealer. If they don't have it, they can order it. Or call us directly at 1-800-46-CYRIX for the dealer nearest you.

Cyrix® instead™

All other brand or product names are trademarks or registered trademarks of their respective holders.

Circle 92 on reader service card

ing Your Money. For example, it can't update securities prices automatically by calling up an online data service at prespecified intervals. Furthermore, while it can calculate your net worth, Quicken (unlike Managing Your Money and Simply Money) lacks the ability to advise you on how to maximize your financial assets.

Like its DOS counterpart, Quicken for Windows includes a new financial calculator that makes it easier than ever to pay bills. In the Windows version you can select a previous transaction with your mouse and drag it onto the calendar, then drop it on the payment day. When you specify the frequency of payment, Quicken projects future payments as far ahead as you need.

The calendar in the Windows version displays details down to the name of the payee on each date. It also allows you to color-code days for special events, adding a red-letter day for a birthday or a queasy green day for a medical appointment. Unfortunately, Quicken's calendar can't be printed.

FEATURES COMPARISON

Personal Finance Packages: Not Created Equal

● Yes
○ No

	Kiplinger's CA-Simply Money 3.1	BEST BUY Managing Your Money 10.0	Microsoft Money 2.0	MoneyCounts for Windows 1.0a	BEST BUY Quicken for DOS 7.0	BEST BUY Quicken for Windows 3.0	WinCheck 3.0p
Standard features							
List price	$69.99	$79.95	$69.95	$49	$69.95	$69.95	$39.95
Operating environment	Windows	DOS	Windows	Windows	DOS	Windows	Windows
Disk space required (MB)[1]	4.5	5	2	3.5	2.5	5	1
Number of initial setups	3	0	3	5	3	3	1
Calendar	●	●	○	○	●	●	○
Calculator	●	●	●	○	●	●	●
Checkbook management							
Memorizes regular payments	●	●	●	●	●	●	●
Splits categories	●	●	●	●	●	●	●
Budgets	●	●	●	●	●	●	●
Reconciles bank account against statement	●	●	●	●	●	●	●
Cost of check starter forms[2]	$117.90	$101.85	$99.90	$91.05	$86.90	$86.90	$70.40
Customizes check printouts	○	●	○	○	○	○	●
Electronic payment interface	●	●	●	○	●	●	○
Tracks credit card expenses	●	●	●	●	●	●	●
Credit card interface	○	○	○	○	●	●	○
Income tax							
Tax categories	●	●	●	●	●	●	●
Interface to tax software	●	●	●	●	●	●	○
Reporting							
Compares actual to budgeted expenses	●	●	●	●	●	●	●
Compares this year to last	○	●	●	●	●	●	○
Customizes reports	●	●	●	●	●	●	●
Generates business financial reports[3]	○	○[4]	○	●	○	○	○
Loan amortization	●	●	●	●	●	●	○
Portfolio management							
Displays securities price history	●	●	○	○	●	●	○
Imports securities prices	●	●	○	○	●	●	○
Measures return on investment	●	●	○	○	●	●	○
Measures investment yields	●	●	○	○	●	●	○
Financial planning							
Provides financial advice	●	●	○	○	○	○	○
Estimates future cash flow	○	●	○	○	●	●	○
Estimates future net worth	○	●	○	○	○	●	○
Estimates retirement income	●	●	○	○	●	●	○

[1] Rounded up to the nearest ½MB.

[2] Includes 500 standard-size voucherless checks, 250 double-window envelopes, and shipping and handling charges.

[3] For double-entry bookkeeping including trial balance.

[4] Prints invoices and tracks accounts receivable.

Quicken for Windows offers a useful financial planning graph that isn't duplicated in any other program, not even its DOS sibling. This takes into account recurring payments and projected income and shows the ups and downs of your cash balances for up to two years at a glance. The planning graph clearly shows when your projected account balance falls into an overdraft. Then it's time for you to arrange a bank loan—or head for the border. On the brighter side, you'll also be able to see if you'll have enough cash to afford that fancy new projection TV set by summer or to take that vacation you've been dreaming of.

Although both Quicken programs provide similar capabilities, the Windows version has a slight edge when it comes to financial capabilities. For example, the portfolio manager offers 18 different measures of investment performance in the Windows version, compared with 14 in the DOS software.

The Windows version also allows you to customize the scrolling icon bar to include one-click access to frequently used reports and functions. There are more than 40 icons you can select from to represent as many as 25 different actions. And custom reports are easier to create since Quicken for Windows lists many check-off options on one screen.

So which version of Quicken should you buy? Both packages cost $69.95, but the added capabilities and easier custom reporting of the Windows version make it the better choice—assuming, of course, you have at least a 386-based machine. *Intuit, 800/624-8742, 415/322-0573.*

WinCheck 3.0p

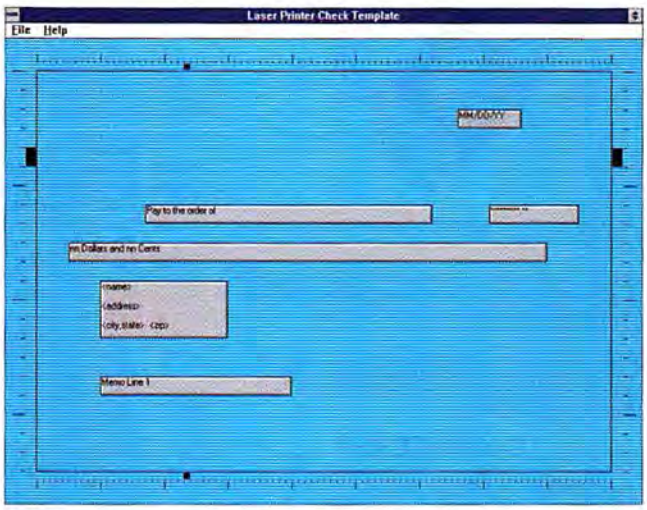
PROS: Easy to use, includes custom check-form designer
CONS: Lacks financial features

WINDOWS WinCheck is a plain-vanilla checkbook manager, the bargain of the personal finance software lot at a list price of just $39.95. The program handles the basics of creating checks and tracking expenses, but it does little else.

Don't look to this package for any help in planning your finances or for assistance in managing your portfolio of stocks, bonds, and so on. It doesn't even include any financial graphs, which is unusual for a Windows-based program. Still, its elegant simplicity means you won't need to fight your way through complicated menus. WinCheck is the most straightforward and the easiest to learn of the personal finance programs we looked at in this review.

WinCheck's check register displays the transactions for just one month, defaulting to the current month. You can also view transactions from prior months if you like, but you have to retrieve them one month at a time.

Even though it's limited to displaying a single month, WinCheck's check register view gives you a fairly complete picture of your cash assets. It shows you the running cash balances calculated by the program for both checking and savings accounts as well as the balances recorded on your bank statements for both accounts.



WINCHECK ALLOWS YOU TO CUSTOMIZE YOUR own checks. The program's forms-design capability makes it compatible with just about any preprinted check form.

It's easier to record transfers between savings and checking accounts in WinCheck than it is in most other personal finance programs. All it requires is a simple menu command: Just click and transfer the funds. (Now if only dealing with financial institutions could be that painless.)

Surprisingly, WinCheck comes with an easy-to-use forms designer. This allows you to drag and drop elements such as payee name, amount, and date anywhere on a check. Managing Your Money is the only other program that lets you modify check layouts, but its character-based orientation makes it rather difficult to visualize what you're changing.

This forms-design capability should make WinCheck compatible with most check forms. It's no surprise that Wilson Window Ware also charges less for checks than any other company.

If what you're looking for is an inexpensive, no-frills check-writing package, WinCheck is the ticket. *Wilson Window Ware, 800/762-8383, 206/938-1740.* **Reader service no. 615**

Stop! Don't Type in Those Expenses

Got a lot of credit card transactions you want to track? Then take a look at IntelliCharge, a Visa credit card offered by Quicken. With this card you receive your monthly statements on floppy disk or via your modem. Quicken reads the statement data, then categorizes the expenses according to your preset preferences. This saves you the tedium of having to enter and categorize the expenses manually every month.

There's no charge for the credit card, and the first six months of electronic statement delivery is free. After the six-month period is up, it costs $3 per month for modem delivery and $4.50 per month for floppy disk, which is billed annually.

If you have a lot of credit card transactions, IntelliCharge could prove worthwhile. Unfortunately, the credit card is available only for Visa from Primerica Bank. But other software developers are working on electronic statements that will be available from many different banks and credit card issuers.

1990, 1991 and 1992 World Class Awards for Best Mail-Order Company

All software is not copy-protected, unless indicated otherwise by *(CP)*.

The four- or five-digit number next to each product is the product's ITEM NUMBER. Please refer to this number when ordering. Thank you.

We carry only the latest versions of products. Version numbers are current at press time. Products listed here in red are Microsoft Windows Applications.

COMPUTERS

Compaq Computer ... 3 years
9031 ProLinea 4/33S Local Bus, 120 MB, Win. $1099.95
8984 ProLinea 4/33S Local Bus, 240 MB, Windows 1249.95
10894 ProLinea 4/50 Local Bus, 240 MB, Windows, PFS: WindowWorks, fax modem 1759.95
13553 Concerto 4/25 with pen, 250 MB, Windows for Pen Computing..... 2649.95
11420 Contura 4/25 with 209 MB, Windows 2199.95
11417 Contura 4/25C with 209 MB, Windows 2879.95
11646 DESKPRO 4/66M with 510 MB, Windows.. 3599.95
2016 LTE Lite 4/25 with 120 MB, Windows 2049.95
3029 LTE Lite 4/25E with 209 MB, Windows..... 3099.95

NEC
13347 Ready 425es Local Bus, 170 MB, Windows.. 999.95
13346 Ready 433es Local Bus, 210 MB, Windows 1229.95
13345 Ready 466es Local Bus, 250 MB, Windows 1729.95
Monitors not included with Systems.

Texas Instruments
13312 TM4000E WinDX 2/50 Mono w/200 MB 2739.95
6441 TM 4000E WinDX2/50 Active Matrix 200 MB 3799.95
8934 TM 4000E WinSX/25 Notebook with 120 MB 1899.95
4696 TM 4000E WinSX/25 Passive Color 120 MB 2149.95

Toshiba
13954 T1950CS Passive Color 120 MB ..... 2499.
13953 T1950CS Passive Color 200 MB ..... 2699.
13952 T1950CT Active Matrix with 340 MB..... 3399.

BUSINESS APPLICATIONS

3-D Visions
8883 Stanford Chart for Windows..... 58.95

Borland International
6788 Quattro Pro 5.0 for Windows *(3½" only)*..... 44.95
10710 Paradox 4.5 for Windows *(3½" only)*..... 145.95
11915 Borland Office for Windows 1.5 *(3½" only)*... 239.95

Caere
4277 OmniScan 289.95 8933 OmniPage Pro 2.1 489.95

ChipSoft
8798 DOS Headstart State Pkg. 24.95 8415 Win. 24.95
1663 TurboTax 1040 DOS *(Headstart Edition)*..... 39.95
3517 TurboTax 1040 for Win. *(Headstart Edition)* .. 39.95
6221 Turbo Tax/Quicken DOS Bundle..... 54.95
3080 Turbo Tax/Quicken Windows Bundle..... 54.95

Claris Corporation
6022 ClarisWorks for Windows with Quicken Bundle 119.95
5257 FileMaker Pro Win. 119.95 5228 Comp. Upgrd. 95.95

Intuit
2426 Quicken 7.0 $39.95 5596 3.0 for Windows $39.95

LaserTools
6882 PrintCache 3.1 ..... 59.95

Lotus
10108 SmartSuite 2.1..... 439. 6233 Upgrade..... 289.
2756 1-2-3 4.0 for Windows *(2755 5¼")* ..... 299.
3428 1-2-3 4.0 for Windows Upgrade *(3424 5¼")*..... 95.
13578 Ami Pro with Quicken Bundle..... 249.
13577 Ami Pro with Quicken Competitive Upgrade .... 109.
5005 Freelance Graphics 2.0 for Win. *(3523 5¼")*.... 335.

MECA
2798 Managing Your Money 10.0 ..... 34.95
4603 TaxCut for DOS *(Headstart Edition)*..... 12.95
3885 TaxCut for Windows *(Headstart Edition)*..... 12.95
11124 TaxCut State Packages *(Headstart)* ..... *ea.* 29.95

Microsoft
11325 MS-DOS 6.2 Upgrd. *(3½")* *while supplies last* 47.95
7009 Windows 3.11 *(7010 5¼")*..... 95.95
12707 Windows NT *(3½" & CD included)*..... 299.95
7811 Word for Windows 6.0..... 299.95
2931 Access for Windows 1.1 *(2932 5¼")*..... 299.95
8138 Office 4.0 for Windows *(8137 5¼")*..... 479.95

MicroTac Software
13380 Spanish Assistant Win. 54.95 13377 Italian. 54.95
13379 French Assistant Win... 54.95 13378 German 54.95

Peachtree
12287 Accounting for Windows Release 2 ..... 115.95

Polaris Software
4395 PackRat 5.0..... 179.95

Software Marketing
5145 BodyWorks 3.0 39.95 12714 PharmAssist Win. 39.95

Software Publishing
4402 Harvard Graphics 2.0 for Win. *(4403 5¼")*... 269.95

Toshiba
13954 *T1950CS Color Notebook w/120 MB*—i486DX2 40MHz, 9.5" dual scan Dynamic STN Color LCD VGA display, 4 MB RAM (upgrad. to 20 MB), Ballpoint Mouse **$2499.**
13953 *T1950CS with 200 MB* ..... **2699.**

Symantec
1625 ACT! DOS 2.11 259.95 7435 Windows 1.03 259.95

WordPerfect Corporation
3445 Presentations 2.0 Win. 299.95 7582 DOS 279.95
3795 WordPerfect 6.0 DOS 279.95 6274 Ver. Upgrd. 99.95
12914 WordPerfect Win. 299.95 12963 Ver. Upgrd. 99.95

GRAPHICS & DESIGN

Abracadata, Ltd.
13046 Design Your Own Home -Architecture Windows 31.95

Microsoft
10154 *Visual Basic for Windows Standard Ed.*—Fast object oriented programming language & access to data make this the most productive way to go from idea to application **$129.95**
10437 *Visual Basic 3.0 Pro. Edition* .. **319.95**

Adobe Systems
10774 Adobe Photoshop.. 548.95 6439 Illustrator .. 429.95
5475 Adobe Illustrator & Photoshop Bundle 599.95

Aldus
1085 FreeHand for Windows *(3½" only)* 395.95
11667 PageMaker 5.0 Win. 579.95 6678 Upgrade 139.95

Altsys Corporation
12551 Fontographer & Typestry Bundle 279.95

Ares Software
8582 Font Workshop 149.95 8584 Font Chameleon 179.95

Corel Systems
11896 CorelDRAW! 4.0 .. 389.95 7923 Upgrade. 225.95

DeltaPoint
3435 Graphics Tools! 1.0 for Windows *(3½" only)*.. 99.95

Fractal Design
4356 Painter 2.0.... 259.95 13218 PainterX2 ..... 93.95

HSC Software ... 30 day MBG
12867 Digital Morph 1.0 *(3½" only)*..... 67.95

Micrografx
3628 Windows Draw! 3.0 *(3627 5¼")*..... 49.95

Microsoft
10051 Font Pack 2Win. 45.95 6103 Arcade 1.0..... 27.95

North Coast Software
6992 PhotoMorph 1.0 for Windows..... 89.95

Shapeware
5426 Visio 2.0 for Windows *(3½" only)*..... 119.95

T/Maker
4680 Incredible Image 2000 Win. 89.95 3148 DOS 89.95

SYSTEM UTILITIES & PROGRAMMING

Avery Dennison
6006 Label Pro 1.65 *(Laser)* 45.95

Berkeley Systems
6642 Disney Collection Screen Saver *(3½" only)*.... 29.95
3528 After Dark 2.0 for DOS *(3½" only)*..... 29.95
12030 More After Dark (M.A.D.) for Win. *(3½" only)*.. 23.95
6649 Star Trek: The Screen Saver *(3½" only)*..... 29.95

Central Point Software
9555 Anti-Virus 2.0 *(9751 5¼")* or 8114 Backup 8.0 *ea.* 89.95
12833 PC Tools 9.0.. 94.95 11395 for Windows... 84.95

Claris Clear Choice
13219 Imaginaria for Windows *(screen saver)*..... 34.95

Computer Associates
2970 CA-Clipper 5.2 for DOS..... 489.95

Borland International
6788 *Quattro Pro 5.0 for Windows (3½" only)*—A revolutionary spreadsheet for Windows. Features Spreadsheet Notebooks and Object Inspector to manage your spreadsheets quickly and effectively **$44.95**

Fractal Design
4356 *Painter 2.0 for Windows*—Turns your computer into an expressive fine-arts tool. Texture, color, or Artists' Technique, this program accommodates your needs **$259.95**
13218 *PainterX2*—Expert extension.. **93.95**

NEW!

Berkeley Systems
6642 *Disney Collection Screen Saver (3½" only)*—Over 15 colorful animated Disney displays with classic Disney voices & sounds **$29.95**
3528 *After Dark 2.0 DOS (3½" only)*—Invite flying toasters & more to your PC!.. **29.95**

Computer Associates

2970 *CA-Clipper 5.2 for DOS*—A robust language, efficient linker, flexible preprocessor & high-performance compiler. Incl. an editor, debugger and make utility for creating PC and LAN-based applications. **$489.95**

DataViz, Inc.
6508 Conversations Plus for Windows 1.0 *(3½" only)* 89.95
Delrina
9853 Opus 'n Bill Screen Saver 29.95
Hewlett-Packard
8731 Dashboard 2.0 for Windows 45.95
Micro Logic Corporation
6787 Info Select for DOS 87.95
12145 Info Select for Windows 87.95
Microsoft
10154 Visual Basic 3.0 Windows Std. Ed. *(3½" only)* 129.95
10437 Visual Basic 3.0 Windows Pro. Ed. *(3½" only)* 319.95
11444 Visual C++ Standard Edition *(3½" only)* 125.95
Pacific Microelectronics
13089 Mac-In-DOS for Windows 109.95
PC-Kwik
8004 PC-Kwik Power Pak 3.1 w/Power Disk *(4925 5¼")* 45.95
Qualitas
12541 386MAX 7.0 *(3½" only)* 49.95
Quarterdeck
3217 QEMM 7.0 *(3221 5¼")* 63.95
Stac Electronics
1409 Stacker 3.1 ..... 95.95
Symantec
2360 The Norton Desktop 3.0 for Win. *(2359 5¼")* 115.95
5136 The Norton Utilities 7.0 *(3146 5¼")* 115.95
8535 pcANYWHERE DOS 119.95 11303 Windows 129.95
6250 Speedrive 4.0 *(3½" only)* 65.95
TouchStone Software
11665 CheckIt Pro: Set *(Volumes I & II included)*.. 79.95
XTree
8957 XTree 2.0 Win. 49.95 6161 XTree Gold 3.0 95.95

NETWORKING/COMMUNICATIONS

3 Com ... lifetime (conditional)
3453 EtherLink II/16.. 159.95 3469 II/16 TP ... 169.95
Asanté Technologies ... 5 years
2775 8 Port Hub 249.95 2772 12 Port Hub.... 499.95

Ares Software

8582 *Font Workshop Windows*—FontMonger, FontMinder, & FontFiddler bundled **$149.95**
8584 *FontChameleon Windows*—Synthetic font technology lets you build billions of fonts from one master font outline **179.95**

Artisoft
2234 Lantastic AE-2 EtherNet Starter Kit DOS 5.0 $459.95
2452 AE-2 EtherNet Adapter Card 199.95
BOCA Research ... 5 years
8397 M1440I FaxModem 119.95 8398 M1440E 149.95
CoActive Computing
1174 Connector DOS 134.95 1143 Connector Win. 134.95
1184 Coactive Connector Mac 29.95
Data Storm
4798 PROCOMM PLUS 2.01 69.95 2006 Windows 95.95
DCA/Crosstalk
5611 Crosstalk 2.0 for Windows 119.95
Delrina Technology
2446 WinFax PRO 3.0 79.95 5974 DOSFax PRO 49.95
Hayes ... 2 years
11396 ACCURA 144 + FAX 144 *(external)* 229.95
11397 ACCURA 144 + FAX 144 *(internal)* 199.95
7395 OPTIMA 144 + FAX 144 389.95 8167 PCMCIA 389.95
Hilgraeve
12081 HyperAccess Win.... 109.95 8204 DOS 59.95
IBM
13207 Internal Fax/Modem *(P/N MOD531)* 49.95
Intel ... 3 years
2994 EtherExpress 16 or 3021 16 TP ..... *ea.* 99.95
1531 FaxModem 14.4/14.4 *(int.)* 159.95 1536 *(ext.)* 179.95
5994 SatisFAXtion Modem/400 ..... 285.95
12934 14.4 PCMCIA FaxModem 299.95
8903 2400 bps Wireless Modem *(for cc:Mail)* 649.95
Megahertz ... 5 years
10515 C5144 14.4 Fax/Modem *(Compaq LTE/Contura)* 419.95
12763 XJ1144 14400 Fax/Modem *(PCMCIA)* 319.95
Microcom
6234 CarbonCopy Plus 6.1 129.95 4410 Windows 129.95

ChipSoft

3517 *TurboTax 1040 Win.*—Easy, fast, accurate. Features EasyStep & includes over 90 forms, schedules, & worksheets, IRS instructions, tax help, & itemizations..... **$39.95**
1663 *TurboTax 1040 for DOS*..... **39.95**

Microsoft
5743 Windows for Workgroups *(6207 5¼")* 159.95
Novell
12058 NetWare 4.0 *(10 user)* 1899.95
12056 NetWare 4.0 *(25 user)* 2799.95
Practical Peripherals ... lifetime
10570 PM14400FX MT 215.95
9234 PM14400FXPPM Pocket Fax/Modem 359.95
6123 PractiCARD 144 (PCMCIA card) 389.95
Shiva
NetModem/E for Win. for Workgroups.. *ea.* 1479.95
Solectec
13083 AirLan Bridge 344.95
Starter Kit *(ISA or MCA)* ..... *ea.* 1369.95
Supra ... 5 years
5252 SupraFaxModem 144LC 149.95
11441 SupraFaxModem V.32bis External 209.95
Technology Concepts ... 2 years
6315 Fax Line Manager 203 ..... 124.95
Traveling Software
4407 LapLink V 99.95
U.S. Robotics
11923 Sportster 14.4 FaxModem Internal 159.95
11924 Sportster 14.4 FaxModem External 184.95

800-800-0003

MEMBER DIRECT MARKETING ASSOCIATION

PC Connection **194PCW**
6 Mill Street
Marlow, NH 03456
SALES 603-446-0003 **FAX** 603-446-7791

Texas Instruments

6441 *TravelMate 4000E WinDX2/50 Active Matrix Color Notebook*—6.3 pounds, 200 MB, 16 ms IDE Hard Drive, 8.4" Active Matrix Color Display, 4 MB RAM (upgradeable to 20 MB), 1.44 MB Floppy, Trackball **$3799.95**

6631 WorldPort 14.4 PMCIA FaxModem 319.95
11922 WorldPort 14.4 Pocket FaxModem 329.95
Zoom Telephonics ... 7 years
3386 FaxModem AFC 24/96/48 *(internal)* 49.95
9519 FaxModem VFP 24K *(internal)* 175.95
9522 FaxModem VFX 24K *(external)* 199.95
13172 VFP V.32bis with CoSession Remote 134.95
13171 VFX V.32bis with CoSession Remote 169.95

VIDEO & SOUND

Adobe Systems ... 120 day MBG
12891 Premiere 1.0 for Windows *(3½" only)* 179.95
Aristosoft, Inc.
6780 Wired for Sound Pro 2.0 ..... 39.95
ATI Technologies ... 5 years
12296 Stereo FX-CD 114.95 12720 VGA Wonder GT 174.95
3886 Graphics Ultra + 2 MB 249.95 3871 Pro 2 MB 369.95
11022 Graphics Ultra Pro EISA *(with 2 MB)* 399.95
Claris Clear Choice
13907 Alice to Ocean *(Book & CD)* 46.95
Creative Labs ... 1 year
5770 Sound Blaster 16 MCA ASP 209.95
Diamond Computer ... 5 years
1569 Stealth 24 VLB.. 159.95 1585 Viper VLB.. 414.95
Hauppauge
10593 Win/TV with Microsoft Video for Windows ... 419.95
IBM
13199 16 bit Audio Card *(P/N AC 523)* 169.95
Intel ... 3 years
11587 Smart Video Recorder 499.95
KOSS Corporation ... lifetime
11323 HD-4 speakers 54.95 11700 HD-6 speakers 79.95
Logitech ... 2 years
12421 AudioMan .. 89.95 11462 SoundMan 16.... 109.95
Media Vision ... 3 years
5637 ProAudio Spectrum 16 169.95 12028 Studio 219.95
NEC ... 2 years
11949 MultiSync 3FGE... 629.95 11948 4FGE... 749.95

CoActive Computing

1143 *CoActive Connector for Windows*—Connect PCs or Macs in 5 min., guaranteed. Plugs in parallel port for file & printer sharing with up to 32 sys. Incl. hardware, software, & cable **$134.95**
1174 *for DOS* **134.95** 1184 *for Mac* **29.95**

PC CONNECTION®

© COPYRIGHT PC CONNECTION, INC., 1993. PC CONNECTION, PCTV AND THE RACCOON CHARACTER(S) ARE REGISTERED TRADEMARKS OF PC CONNECTION, INC., MARLOW, NH. ALL OTHER TRADEMARKS REMAIN THE PROPERTY OF THEIR RESPECTIVE COMPANIES.

Qualitas

12541 *386MAX 7.0 (3½" only)*—New 386MAX version 7 makes DOS under Windows better than DOS itself. Get more conventional memory, a comprehensive memory tester and special support for DOS 6..... **$47.95**

Sony ... 1 year

6803 CDU-31A-02 Internal CD-ROM Drive 159.95
10530 CPD-1430 14" Multiscan Trinitron Display..... 689.95
6802 Interface Kit *(OPA-4741)*..... 54.95

INPUT/OUTPUT

Caere ... 1 year

4277 OmniScan *(with OmniPage Direct)* 289.95

Canon ... 1 year

7809 BJ-200 BubbleJet Printer 315.95
9614 BJC-600 Color Inkjet 599.95

CoStar ... 1 year

1814 LabelWriter II Plus 239.95

Epson ... 2 years

11800 LQ570+ *(80 col., 269 cps)*..... 269.95
10784 Action Laser 1500 *(2 MB)* 699.95
13110 Action Scanning System 849.95

Hewlett-Packard ... 1 year

6442 LaserJet 4 *(with toner)* 1479.95 12212 4L 699.95
7620 DeskJet 550C 629.95 13682 LasrJet 4P 1059.95

IBM

13210 Joystick *(P/N JOY 575)*..... 19.95
13485 Professional Keyboard *(P/N KB571)*..... 89.95

Kensington Microware ... 1 year

7899 Expert Mouse 4.0 *(Serial)* 99.95 7900 *(Bus)* 114.95

Kraft ... 5 years

8346 Thunderstick with JetFighter 2 ..... 39.95

Logitech ... limited lifetime

3996 Trackman2 *(combo)* 79.95 2343 Portable.. 99.95
3295 Mouseman *(combo)* 59.95 9766 *(cordless)* 89.95
2468 ScanMan256 with OmniPage Direct 199.95
7463 ScanMan Easy Touch for Windows 229.95
13934 Cyberman 3D Controller 79.95

Microsoft ... lifetime

7597 Microsoft Serial Mouse 69.95 2898 with Win. 145.95
1896 Ballpoint Mouse..... 79.95

MicroSpeed ... 1 year

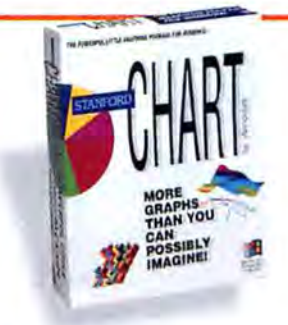
6007 PC-TRAC Trackball..... 59.95

Microtek ... 1 year

13362 SCANDEX..... 279.95 13361 Scooter 419.95
5187 ScanMaker II 879.95 5175 ScanMaker IIxe 1099.95
13359 ScanMaker IIG.... 489.95 13360 IISP 749.95

Mouse Systems ... lifetime

7878 PC Mouse III *(serial)*.. 69.95 9082 Mouse!.. 19.95



3-D Visions

8883 *Stanford Chart Win.*—Provides over 165 2-D and 3-D graph types for business, statistical, and technical users, plus a sophisticated built-in spreadsheet and floating assortment of drawing and annotation tools .. **$58.95**

Mustek ... 1 year

8452 Gray Artist for Win. *(256 GS hand scanner)* $165.95

Okidata ... 1 year

6174 OL400E Laser Printer 549.95

Pacific Data

13040 ProTracer II 1399.95 13041 with HP-GL 1849.95

Seiko ... 1 year

1069 Smart Label Printer Plus *(Windows or DOS)* 145.95

ACCESSORIES

American Power ... 2 years

3819 Back-UPS 250 115.95 3858 Back-UPS 400 179.95
7107 Back-UPS 450 215.95 7105 Smart-UPS 600 439.95

Curtis ... lifetime

7654 Command Center Plus..... 78.95

Cyrix

10538 486 DRX2 25/50 Microprocessor Upgrade .. 339.95

Intel ... lifetime

4750 80387SX..... 79.95 5409 80387DX 85.95
6418 Intel 486 DX2 OverDrive Processor 486SX-25 369.95

Kensington Microware ... 1 year

Full line available. Partial listing.

7060 MicroSaver Security System..... 38.95

PC Power & Cooling ... 2 years

9537 CPU Cooler *(for 386/33 up to 486)* 29.95
3203 Turbo Cool 200 149.95 7915 Turbo Cool 300 159.95

Targus ... lifetime

7369 Notepac..... 35.95 1305 Universal..... 69.95

Tripp Lite ... 2 years

6199 Isobar 4-6..... 43.95 6200 Isobar 6-6 ..... 49.95
5550 BC250 Battery Backup 119.95 9312 BC500 219.95

DRIVES

Colorado Memory Systems ... 1 year

4354 Jumbo 250 Tape Backup 179.95
1073 Trakker 250 Tape Backup *(parallel)*..... 349.95

ON CD-ROM

DeltaPoint

3435 *Graphics Tools! 1.0 Windows (3½" only)*—Organize your graphics in a drag and drop thumbnail viewer, convert files, autotrace, image editing, painting, screen capture, 700 pieces of clip art & dozens of photos **$99.95**

Conner Peripherals ... 1 year

2339 CP30104H 120 MB IDE HD *(19 ms)*..... 199.95
1337 CP30204 210 MB IDE HD *(16 ms)* 256.95
13503 CP30540 540 MB SCSI Drive 699.95

Iomega ... 1 year

10452 Transportable MultiDisk 150 ..... 559.95
6344 PC Powered 90 PRO 489.95 10537 150 479.95
2530 90 MB Cartridge... 100.95 2467 Tripak... 289.95
8481 Tape250 Insider Half-Height Tape Backup .. 209.95

MDS Removable Hard Drives

11851 MDS 105 MB 3.5" Internal Removable IDE . 429.95

NEC ... 2 years

13339 CDR-400 MultiSpin 3Xp 13341 CDR-500 3Xi *ea.* 499.95
13340 CDR-600 MultiSpin 3Xe 599.95

TEAC ... 1 year

6951 1.2 MB Drive for AT 55.95 7371 1.44 MB Drive 45.95
4414 3.5"/5.25" Dual Floppy Drive 145.95

MEMORY

1411 1 MB x 9 SIMMs *(70 nanosecond)* ..... call
3702 4 MB x 9 SIMMs *(60 ns)* 2497 4 MB x 9 *(80 ns)* call
5746 1 MB Chips *(80 nanosecond, set of 9)* ..... call

DISKS/MEDIA

Fuji ... lifetime

2215 3.5" HD Disks *(10)*.... 11.95 2241 *(50)*.... 49.95
5692 3.5" HD Preformatted Disks *(20)* w/storage case 24.95

Kao

11870 3.5" HD Disks *(10)*.... 10.95 11869 *(30)*.... 31.95

Sony ... 1 year

6375 3.5" HD Disks *(30)*.... 32.95 11871 *(100)*..... 89.95
1603 DG60M *(2 yr.)* 11.95 2520 DG90M *(2 yr.)* 14.95

3M ... lifetime

1581 DC2120 Cartridge 18.95 11013 *(3 pack)* 49.95

Includes OmniPage Direct

Logitech ... limited lifetime

13934 *CyberMan 3D Controller*—Input device for games that lets you move freely in 3 dimensions **$79.95**

7463 *ScanMan EasyTouch Windows*—Personal scanner with 256 gray-scale..... **229.95**

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order (in the U.S.).
- No sales tax, except Ohio residents (please add applicable tax).
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail.
- International orders: U.S. $100 minimum, add 2% surcharge and $2.30 insurance. Manufacturer support and upgrade eligibility may be limited outside the U.S.A. Some products not available for export, call or fax information.
- Upon receipt and approval, personal and company checks clear the same day for immediate shipment of your order.
- Corporate P.O.s accepted subject to approval.
- COD max. $1000. Cash or cashier's check. COD orders require an additional $4.50 charge. COD orders ship via UPS and may require additional UPS charges.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice (e.g. SIMMs).
- We are not responsible for typographical errors.
- Order lines opened continuously from 8 a.m. Monday until 5 p.m. Sunday ET. Business offices at 603-446-3383 Monday through Friday 9 a.m. to 5:30 p.m. ET.

SHIPPING

Continental U.S.: The total freight charge on any order placed with PC Connection is only $5. Barring events beyond our control, all credit card orders (no COD orders) phoned in weekdays by 3 a.m. ET will ship Airborne Express for delivery the next business day. Which means *same day* delivery for orders placed between midnight and 3 a.m. ET. (Some orders may ship by UPS Ground for next day delivery). Saturday delivery available to many areas upon request at no additional charge. Order all day Saturday through noon on Sunday for Monday delivery. (Some areas require an additional day delivery).
Hawaii, Alaska, Canada, Puerto Rico and the U.S. Virgin Islands: Shipping to these areas may require additional time and charges. Call 800-800-0003 for information.
All other areas: Please call 603-446-0003 or FAX 603-446-7791 for information.

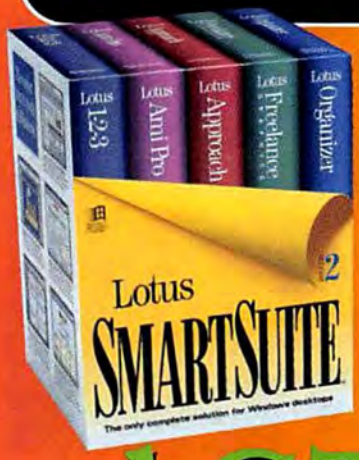
MicroTac Software

13380 *Spanish Assistant for Windows*—Gives you fast, understandable translations to or from Spanish. Incl. powerful reference tools **$54.95**
13379 *French Assistant for Windows*..... **54.95**
13378 *German* **54.95** 13377 *Italian* **54.95**

PC CONNECTION

YOUR SOURCE FOR SYSTEMS, SOFTWARE AND PERIPHERALS

We carry over 3500 products! Call for our latest catalog!



SMART

SUITE UPGRADE INCLUDES IMPROV BONUS

$289

ACTIVE

COLOR MATRIX DISPLAY FROM TI

$3799.95

TURBO

SHOW THE IRS YOU MEAN BUSINESS

$34.95* *With $5 rebate coupon!*

WIRED (NOT!)

NEW WIRELESS MODEMS FROM INTEL

$649.95

800-800-0003

COPYRIGHT 1993 PC CONNECTION, INC. PC CONNECTION, EVERYTHING OVERNIGHT, PCTV, AND THE RACCOON CHARACTER(S) ARE REGISTERED TRADEMARKS AND ONE-MINUTE MAIL ORDER IS A TRADEMARK OF PC CONNECTION, INC., MARLOW, NH.

Here's How

Contents: Spreadsheets 228 | Word Processing 234 | Windows 240 | OS/2 244

HELP LINE Q&A

Tip of the Month

DISABLING CALL WAITING: If you have call waiting service on your phone line, you'll want to disable it before making a call with your modem or fax-modem. Call waiting's beeps can disrupt a fax or modem session and even cause a disconnection.

Most local phone systems let you enter a code—often *71 or *70—to disable call waiting prior to a call. Contact your local company to learn the right code. Add the code to your modem's dialing string in your communication software's modem setup screen so the string begins ATDT*70. After your modem or fax-modem hangs up, call waiting will be reactivated.

If your local phone system doesn't offer a way to disable call waiting temporarily, you'll need to tell your modem to tolerate call waiting's beeps and not to hang up in the middle of a telecommunications session or fax transmission. You'll want to increase the value of its S10 memory register, which sets how long, in tenths of a second, the modem will wait after the loss of the carrier before hanging up. Try adding S10=55 to your modem's initialization string, which is also in your communication software's modem setup screen.

Judy Heim, Contributing Editor

Legal Noise

Q I bought a Pro AudioSpectrum 16 sound card a few days ago, but when I try to use it with almost any of my DOS-based applications, my system locks up. I tried using my 386-33 to play music, sound effects, and voice through the board, and the system halted immediately. Please help.
Geoff12P via America Online

A Your problem has two possible sources: one technical, one legal. First, the technical issues: The Pro AudioSpectrum 16 sound board causes conflicts when installed in many PCs because it takes up two DMA channels, two interrupts, and two blocks of I/O port addresses. (It uses a third interrupt and another port address block if you want it to emulate the Roland MPU-401 MIDI interface.) If other components try to use any of these system resources simultaneously, the system could lock up. In the answer to the next question, I'll describe a product that might help.

Your problems may also be due, at least in part, to a glitch that caused a lawsuit between Creative Labs and Media Vision (the company that made your Pro AudioSpectrum). About two years ago Creative Labs gave software developers a kit intended to help them produce programs that work with the SoundBlaster sound card. Media Vision later filed suit, claiming that the software in the kit *intentionally* crashed users' systems if the board was a SoundBlaster compatible such as the Media Vision board. The lawsuit was settled out of court, so no one knows what the parties agreed to—however, one would hope that later versions of the developers' kit do not have this problem. If you can't find a resource conflict in your PC, and SoundBlaster software crashes on your Media Vision board, call the software vendor and ask for a version that's known to work with your board.

Configuration Conundrum

Q My 486DX-50 has a hard drive, two floppy drives, a CD ROM drive, a sound card, VESA local bus video, and a fax-modem. With all of this hardware, I can't keep track of the DMA and IRQ assignments. What is an easy way to list which DMA and IRQ settings are assigned to a particular board? Is there a standard list of which type of boards should have a particular setting?
Enzo H20 via America Online

A Some software products claim to be able to sniff out which resources are claimed by which peripherals, but I have yet to see one that can identify peripherals such as CD ROM drives and fax-modems. Network installers, who need to maintain multiple systems, use a hardware product such as The Discovery Card. Made by AllMicro of Clearwater, Florida, this card turns on a light each time a DMA channel or interrupt request line is used. Such a card may be able to find out what's going on inside your system. It won't catch I/O port conflicts, so for those you'll still have to keep a list (I use a spreadsheet for this purpose).

If you want to know the standard ports used by AT-compatible peripherals (including those on the motherboard), one of the best books to get is Thom Hogan's *PC Sourcebook*. It contains a wealth of information about

ILLUSTRATIONS: DAVID TILLINGHAST

every aspect of the de facto PC "standard" and will help you pinpoint the resources used by most peripherals.

- **The Discovery Card** $249; AllMicro Inc.; 800/653-4933, 813/446-6660
  Reader service no. 660
- **PC Sourcebook** (ISBN 1-55615-321-X) $39.95; Microsoft Press; 800/677-7377

Mixing Memory

Q I just purchased 4MB of 80ns RAM, but my PC came with 70ns chips. I have not experienced any problems yet. Do you know of any problems that might be lurking over the horizon?
Mr Rodsky via America Online

A Return that memory if you can. You're taking a big chance using memory that's slower than what came with your PC. Since PC clone vendors have such low profit margins, they count every penny. They usually use a particular speed of memory chips because they couldn't get away with using cheaper, slower ones.

In general, it's best to match the speed of the memory already in your system as closely as possible. Believe it or not, adding memory that's significantly *faster* than what came with your machine can also cause problems. This is because faster chips don't just *get* data faster—they also take it away faster at the end of a memory cycle. If the motherboard is expecting a longer hold time, you could wind up with an unreliable system. My motherboard, for instance, will work with 80ns SIMMs but not with 60ns. That's fine with me; it saves me money.

BASIC on the Blink

Q When I run a QBASIC program in DOS 5.0, the text editor screen appears with the name of the BASIC program I am running. The command I use is QBASIC /RUN C:*filename*. Is there a way of running the BASIC program without the annoying text editor screen appearing?
Thomas M. Jones, Derry, Pennsylvania

A The QBASIC interpreter, which comes free with DOS, wasn't designed to look professional or replace commercial compilers. If you need professional-looking code, I recommend that you consider Bob Zale's PowerBASIC (which used to be Borland's Turbo BASIC). The company will even give you a special discount price if you're upgrading from any other BASIC, including QuickBASIC.

- **PowerBASIC 3.0** $149 (competitive upgrade, including QuickBASIC, $99); PowerBASIC Inc.; 800/780-7707, 510/516-7700
  Reader service no. 661

Now You Need It, Now You Don't

Q I once read that the file WINA20.386 had to be in your hard drive's root directory if you wanted to run Windows—unless you specified another location where Windows could find it. Not being particularly observant, I only recently noticed that I had deleted this file from my disk and that no other copy was anywhere on the disk. Yet I have been running Windows just fine without it!

To be on the safe side, I dug out my DOS 5.0 disks and expanded WINA20.386 back into my root directory. Does Windows 3.1 need this file or not?
Ron Wickert, Virginia Beach, Virginia

A WINA20.386 was designed to make DOS 5.0 (and later versions of DOS) work with Windows 3.0. It's a VxD (32-bit virtual device driver) that goes in and patches large chunks of Windows 3.0 to fix memory management and compatibility problems. WINA20.386 isn't necessary if you're running Windows 3.1, but some memory managers and drivers check for its presence. It's therefore a good idea to keep it in the root directory to avoid problems.

Which Way Does the Wind Blow?

Q All modern PCs seem to be ventilated by a blower that pulls air out of the case through the power supply. This blower causes air to enter through

USER GROUP OF THE MONTH

ACGNJ

The January user group tips are supplied by the Amateur Computer Group of New Jersey. ACGNJ holds monthly meetings in Scotch Plains, New Jersey. The group publishes a monthly newsletter featuring hardware and software reviews, tips, industry insights, and a list of support volunteers. The organization sponsors the annual Trenton Computer Festival and maintains an electronic BBS with 500MB of shareware and public-domain software. ACGNJ includes special interest groups for 1-2-3 users, Visual Basic and C programmers, new users, people interested in genealogy, and others.

For more information, contact Bill Farrell, membership chair, at P.O. Box 135, Scotch Plains, NJ 07076, or call 908/572-3481. ACGNJ's BBS is available by calling 908/752-9285 (14.4 kbps) or 908/752-9388 (2400 bps). Membership costs $20 per year for individuals, $25 for families, and $15 for students and seniors.

Reader service no. 662

MAKING YOUR KEYBOARD BEHAVE: Are you having problems with <Caps Lock>, <Num Lock>, <Shift>, <Alt>, or <Ctrl>—for example, Caps Lock won't engage or Num Lock won't release—and using DOS 5.0 or later? Some programs conflict with the ROM BIOS keyboard handler, which tells the processor which keys have been pressed. Add the command C:\DOS\KEYB US,,C:\DOS\KEYBOARD.SYS to your AUTOEXEC.BAT. KEYB.COM replaces the keyboard handler with its own routine and doesn't have these conflicts.

Bob Todd
Amateur Computer Group of New Jersey

the various openings in the case—including the slots of the floppy and CD ROM drives. This air brings with it all the dust and dirt in the surrounding air and eventually makes your disk drives filthy. Wouldn't it be simple to reverse the direction of the blower so that the case would be pressurized, and filter the incoming air with some sort of a quick-change filter? Is a modification kit for this purpose available?
John F. Brunfield, Lynnville, Tennessee

A The makers of some of the best CP/M computers once advertised positive ventilation through the floppy disk drives. However, when IBM came out with the original PC—which was the standard for everything else—it chose the ventilation scheme that's used in all PCs today. I suspect IBM made its design decision because it was concerned that a filter could become clogged, causing the PC to overheat.

Reversing a PC's ventilation would require nonstandard parts—and since the commodity parts in today's PCs enjoy tremendous economies of scale, a machine with a different ventilation system could be much more expensive.

You Must Be Fast to Go Faster

Q I am interested in the chips Cyrix offers as upgrades or replacements for 386DX PCs. My 386DX-16 is slow by today's standards, but its 10MB of RAM, excellent hard drive, and decent video card make it a good system.

Will a Cyrix chip speed up my PC? Will it work with my math coprocessor? Or should I spend more money and buy a 486DX-25 or 486DX-33?
Patrick Buchanan, North Richland Hills, Texas

A Yes, Cyrix's upgrade chips for 386 PCs certainly make them run faster. But your motherboard is limited to 16 MHz, so any CPU upgrade you install will be stuck at that speed, even though it's capable of replacing a 386-25. I recommend either upgrading the motherboard to a 486-33 or 486-66 or buying a new system and finding another use for your older one. Today's systems have so much bang for the buck that your money may be better spent on new hardware than on upgrading what already works.

Double Shuffle

Q If DOS 6.0 or 6.2 is installed with the DoubleSpace compression turned on, will I still be able to copy files onto a floppy and use them on another computer that has DOS 5.0?
J. A. Shepard, Cleveland

A If the floppy is not compressed with DoubleSpace (you have to do this intentionally), data written to it will be uncompressed and can be read by any DOS system. However, if you want to create compressed floppies that are readable by any system regardless of which version of DOS it runs, you can do it with a third-party utility. Vertisoft's SpaceManager and AddStor's DoubleTools give a DOS 6.0 system the capability to produce compressed floppies that can be read by any system (when you make the disk, the compression program comes along for the ride). And all the major brands of compression software other than DoubleSpace (including Stacker, SuperStor, and XtraDrive) have this capability built-in.

- **DoubleTools for DoubleSpace 1.0** $99, **SuperStor Pro 3.0** $149; AddStor Inc.; 800/732-3133, 415/688-0470
  Reader service no. 663
- **SpaceManager 1.5** $89.95; Vertisoft Systems; 800/466-5875
  Reader service no. 698
- **Stacker 3.1** $149 (competitive upgrade for DOS 6.0 $79.95); Stac Electronics; 800/522-7822, 619/431-7474
  Reader service no. 699
- **XtraDrive 3.0** $79.95; Integrated Information Technology Inc.; 800/832-0770, 408/727-1885
  Reader service no. 665

Power Windows

Q I often use two or three Windows programs together. I have to start one program and then get Program Manager to the top and start the other one. Is there an easier way? And can I make programs like Notepad start in the same place every time?
Luke Gedon, Amory, Mississippi

A If you simply want the applications to open every time you start Windows, the answer is simple: Hold down the **<Ctrl>** key and drag their icons to Program Manager's StartUp program group. Each application in that group will automatically be launched when Windows starts. But if you want to preserve the *arrangement* of your programs, you'll need a third-party utility. One of the best for this purpose is XSoft's Rooms for Windows, which can set up several arrangements of applications and switch between them.

- **Rooms for Windows** $59; XSoft; 800/428-2995
  Reader service no. 667

Adding a Second Hard Drive

Q I am considering buying another hard drive for my system. The current drive is a 120MB IDE Western Digital. I have found a used (two-month-old) 212MB IDE Seagate for sale. Will the two work together? If so, how should they be configured?
BOBLANE via America Online

A It depends on the drives. Before the industry developed a standard for IDE, different vendors' drives would not always work together on the same cable. And many vendors, as they gradually brought their products into compliance with the standard, did so without changing model numbers. This makes it almost impossible to tell if two drives will work together without actually testing them. Your best bet is to get a money-back guarantee on the new drive, then try it out.

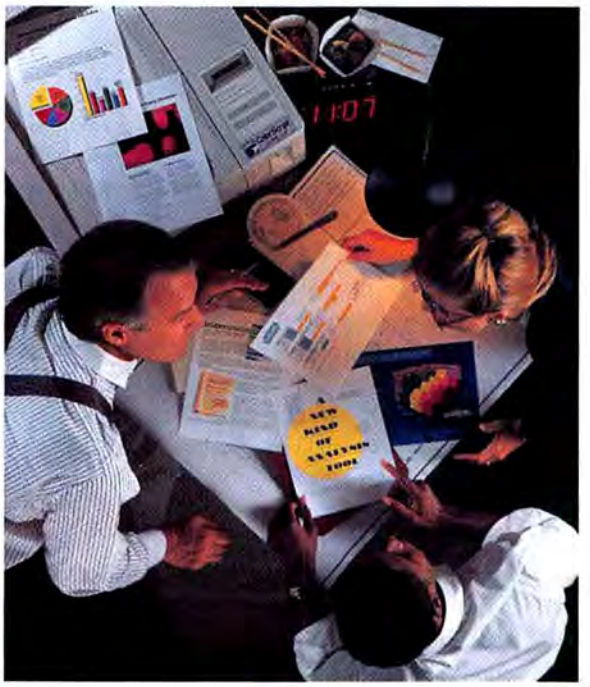
To get correct jumper settings for the drives, call Seagate's tech support at 408/438-8222. It also has a BBS at 408/438-8771 and a 24-hour fax service at 408/438-2620. Western Digital's tech support is at 714/932-4900, and its BBS is at 714/753-1234. Unlike most disk drive companies, WD does not have a fax service, at least at this writing.

By Brett Glass

Brett Glass is a contributing editor for PC World. Help Line *welcomes your questions. See page 12 for contact information.*

June 14, 1963.
Cindy Smith plays with color.

Thirty years later her business
depends on it.



Introducing the QMS ColorScript Laser 1000. Now your business has total freedom of expression.

For Cindy, communicating decision-critical information quickly, flawlessly and in brilliant color is now her livelihood. That's why she depends on the QMS ColorScript® Laser 1000 Print System. It frees her to print entire forms and letterhead with color logos, images and high quality text without changing paper. It saves her the cost of stocking special forms, letterhead and multiple sets of supplies and uses standard paper and transparencies. It improves her message by highlighting key data with color in multipage presentations and documents. Add direct connection to a variety of networks and anyone can realize both greater productivity and a per user cost that rivals personal printers. Plus, our easy software loadable upgrades virtually eliminate obsolescence.

Save money. Save time. Free yourself from limitations. Discover the advantages of the QMS® ColorScript Laser 1000 Print System.

• Laser color and monochrome printing • Compatibility with PostScript™ Level 2 and Level 1, HP PCL®5C and HP-GL® • TrueType font scaling • Automatic collation • Simultaneous input and automatic emulation switching • 65 resident type fonts • EfiColor™ and Colorimetric color dictionaries and Apple ColorSync™ device profile • Supports DOS, Windows,™ Macintosh® and Unix® applications • Software loadable system upgrades

Expression is a serious business.
Call QMS today at 800 972-6695 or 205 633-4300
for the name of a reseller demonstrating
the QMS ColorScript Laser 1000 in your area.

QMS

PCW INFO HOTLINE: INSTANT FAX BACK
1-800-234-0455 ext. 158

Now being demonstrated at resellers in major cities in the U.S.

QMS, QMS ColorScript and the QMS logo are trademarks or registered trademarks of QMS, Inc. PostScript is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other product and company names mentioned are trademarks or registered trademarks of their respective companies.

SPREADSHEETS Q & A

Loans in Any Spreadsheet

Q I have a monthly payment schedule for a loan that shows the amount due, the amount paid toward interest, and the amount paid toward principal. Some months I can pay extra toward the principal, but other months I can't. My understanding is that the amount of interest I pay should decrease when I make extra payments. How can I set up my spreadsheet to show the changes?
Dorothy Parrill,
Northfield, Massachusetts

A Take a look at **FIGURE 1.** I've set up this example in Excel, but it will work in any spreadsheet. The data entry cells, containing the principal, interest rate, and term of the loan are shown in B3:B5; the formulas in D3:D5 give the required payment and the nominal cost of the loan if you paid the required amount each time. The table beginning at A8 contains the history of payments, the principal and interest amount of each payment, the principal remaining after each payment, and the cumulative interest paid.

To set up the model, start by entering the labels and values shown in A3:C5 and in A7:F7. Format cell B4 for percent, cells B8:F17 for two decimal places, and cells B3 and D3:D5 for currency. Enter the payment numbers and amounts shown in the payment schedule in A8:B19. Then enter the following formulas:

D3: **@PMT(B3,B4/12,B5*12)** If you're using Excel: **=PMT(B4/12,B5*12,-B3)**
D4: **+D3*B5*12**
D5: **+D4-B3**
C8: **+B8-D8**
D8: **+B4/12*B3**
E8: **+B3-C8**
F8: **+D8**
C9: **+B9-D9**
D9: **+B4/12*E8*(E8>0)**
E9: **+E8-(C9*(B9>0))**
F9 **+D9+F8**

Finally, copy the formulas in cells C9:F9 into C10:F19 to complete the schedule of payments for a 12-month loan. Copies of this worksheet, in Excel and 1-2-3 form, are available on PC World Online.

If the numbers on your worksheet agree with Figure 1, you've entered the formulas correctly. (In 1-2-3, don't worry if some of the zeros near the bottom of the worksheet appear as negative zeros; see "1-2-3 in the Round" in December 1993 for an explanation.) To apply this to an actual loan, reenter your own numbers in B3:B5, and copy the formulas in C8:F19 into as many additional rows as the length of your loan requires. Then enter your own payments in column B from row 8 down; you will probably want to enter the amount after every payment.

AMORT.XLS

	A	B	C	D	E	F
1	AMORTIZATION SCHEDULE					
2						
3	Loan Principal:	$20,000.00	Required Pmt:	$1,749.03		
4	Interest Rate:	9.000%	Est. Total Pmts.:	$20,988.35		
5	Term (years):	1	Est. Total Int.:	$988.35		
6						
7	Payment Number	Payment Amount	Principal	Interest	Remaining Principal	Cumulative Interest
8	1	1,749.03	1,599.03	150.00	18,400.97	150.00
9	2	1,749.03	1,611.02	138.01	16,789.95	288.01
10	3	1,749.03	1,623.10	125.92	15,166.84	413.93
11	4	1,749.03	1,635.28	113.75	13,531.57	527.68
12	5	2,500.00	2,398.51	101.49	11,133.05	629.17
13	6	2,500.00	2,416.50	83.50	8,716.55	712.67
14	7	2,500.00	2,434.63	65.37	6,281.92	778.04
15	8	2,000.00	1,952.89	47.11	4,329.04	825.16
16	9	2,000.00	1,967.53	32.47	2,361.51	857.62
17	10	2,379.22	2,361.51	17.71	0.00	875.34
18	11		0.00	0.00	0.00	875.34
19	12		0.00	0.00	0.00	875.34
20						

FIGURE 1: USE THIS WORKSHEET to calculate variable real estate principal and interest amounts.

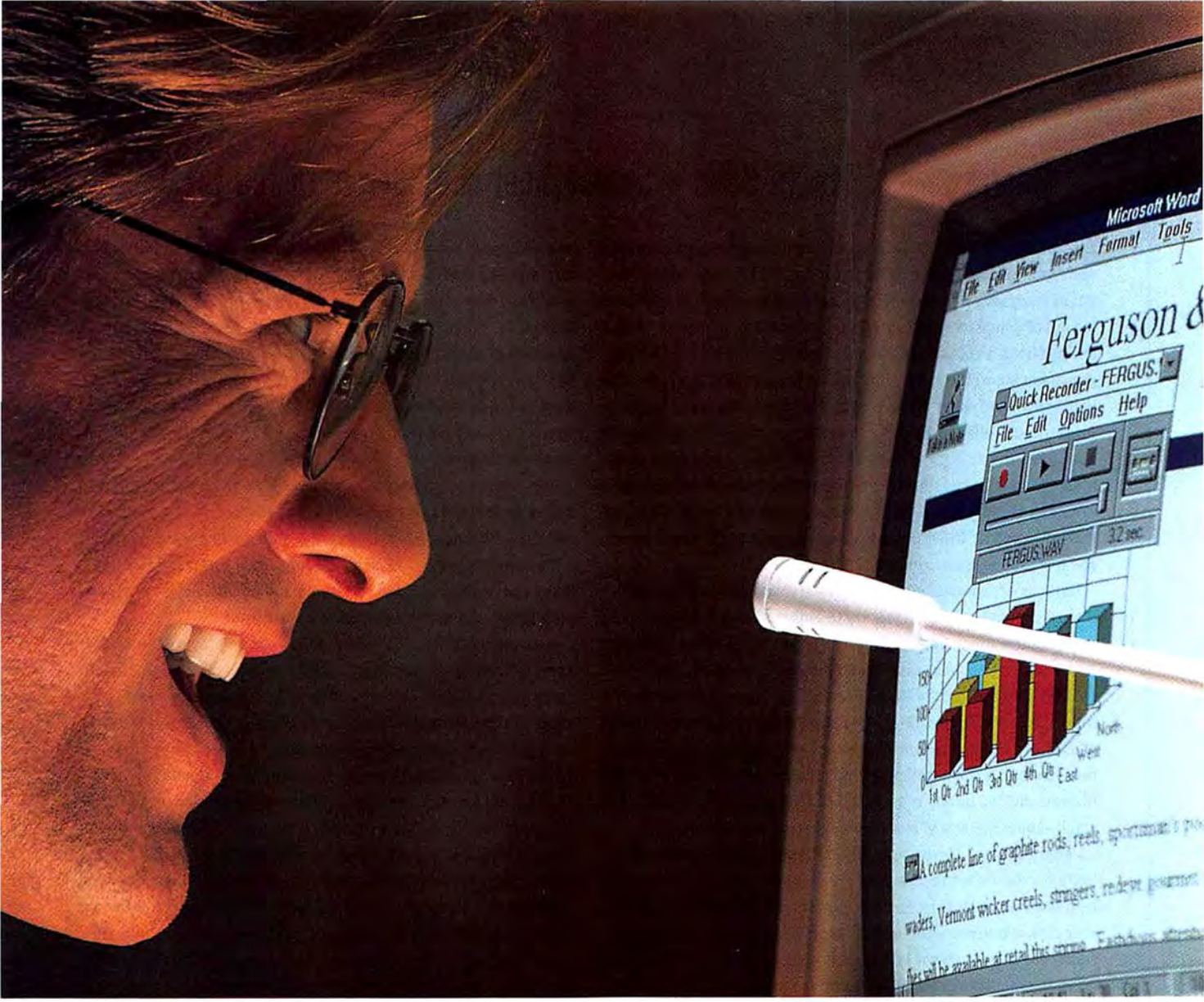
Here's how the formulas work. The required payment formula in D3 uses the PMT function to calculate a loan payment. It yields the amount necessary to pay off a loan given the principal (B3), the number of payments (B5*12), and the interest rate per payment (B4/12). The estimated total payments in D4 is the total of all your payments if you paid just the required amount each time; it includes all interest and principal. The estimated total interest (D5) is simply that amount minus the original principal.

In the payment schedule, the interest portion of the first payment (cell D8) is the interest rate for one month (B4/12) multiplied by the original principal. Thus the principal portion of the first payment (in cell C8) is the amount of the first payment (B8) less that interest portion. The principal remaining after the first payment (E8) is the original principal minus the principal portion of the first payment (B3 minus C8). This number becomes the basis for the interest calculation for the second payment (D9). This formula includes a logical expression (E8>0), which reduces the interest amount to zero after the loan has been paid off, as shown in cells D18 and D19. The remaining principal formula in E9 reduces the previous principal amount by the principal portion of the current payment, but only after a payment has been entered (the logical expression B9>0 sees to that). The cumulative interest column merely adds the interest portion of the current payment to the cumulative interest from the previous payment.

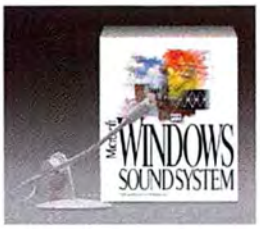
Skipping Over Nothing in Quattro or 1-2-3

Q I have an inventory spreadsheet template in Quattro Pro 4.0 that contains information about 180 products. I fill in the quantities and the cost, and the spreadsheet calculates the selling prices. When I print the sheet, I want it to skip the rows where the quantity is zero. How can I do this without deleting all the zero rows manually?
Gary Webster, Woodstock, Georgia

A One solution that works with any release of Quattro or 1-2-3 is a macro that marks the zero rows with a label that begins with the nonprinting label prefix | and instructs the program to omit those rows from the printout. Another solution that works with any



FIRST WE MADE WINDOWS. NOW IT'S TIME TO TALK.



With the new Microsoft® Windows™ Sound System, just tell your computer what you want it to do. You can customize your system to respond to your personal spoken commands. Even our new directional microphone knows exactly who you are.

This full set of audio software has lots of options, too. Spice up presentations with music or quotes. Or proofread numbers as the computer reads them back.

All for the price of a game.

You can also get this software with the sound board included. So go visit your nearest reseller to see what's creating all the conversation.

Microsoft®
Making it easier

© 1993 Microsoft Corporation. All rights reserved. Microsoft is a registered trademark and Windows and the Windows logo are trademarks of Microsoft Corporation.

Master Class: How to Build a Spreadsheet and Survive to Tell the Tale

James Abbott, who has been teaching people in the Southeast about spreadsheet software since the days of VisiCalc, tells a story about a guy who was living in a cardboard box in Central Park, eating out of dumpsters, and mumbling to himself a lot. Seems this fellow had been a golden boy general manager for a Fortune 100 company—you know, the Jaguar, the kids in prep school, the yacht, the penthouse, and so on. He leveraged the buyout of a major competitor with 1-2-3 release 1A. After the deal was consummated and the cash flows turned out to be red instead of black, the auditors examined our hero's spreadsheets and discovered that everywhere he intended to erase a cell, he had instead entered a space. Thus, all the @AVG and @COUNT functions he used gave the wrong answers. The rest, as they say, is history.

Here are six spreadsheet rules to help you avoid a similar fate:

Don't erase with spaces. **Never try to clear out a cell's contents by pressing the space bar followed by <Enter>. In 1-2-3 and Quattro, this practice causes certain statistical functions—notably @AVG, @COUNT, @STD, and @VAR—to give invalid answers. For instance, the formula @AVG(A1..A5) is equivalent to the sum of the values in A1..A5 divided by the number of nonblank cells in that range. In this scheme, a cell containing a space is equivalent to a zero: the formula divides by one more for the space, and the average is too small—about the size of a cardboard box in Central Park.**

Point, don't type. **Never type cell and range addresses when you build formulas. If the formulas are complex, you will sometimes type the wrong address, and you may not discover the error before your pink slip arrives. Instead, use the arrow keys or the mouse to select the cells you want to include in a formula. If the spreadsheet is large, give important cells meaningful range names. Then, as you build formulas, use <F3> to select the names from a list.**

Never move data cells. **In any spreadsheet, the data cells are the ones you fill in with data—numbers and text—as you work. The other cells contain either formulas that refer to the data cells, static text, or nothing at all. When you move a data cell, whether by dragging and dropping, using the Move command, or cutting and pasting, any formulas that refer to that cell change to refer to the cell's new position. For instance, if cell A1 contains the formula @SUM(B1..B50), and you move the data in B1 to B2, the formula will change to @SUM(B2..B50). Any number you put into B1 from that point on will not be included in the sum. It's a change that's easy to overlook when you're in a hurry—but you'll have plenty of time to reflect on your error while you're standing in the unemployment queue.**

Build formulas using dummy data values. **Never build complex formulas based on real data values; it's too easy to miss careless errors in formulas. Instead, fill in the data cells with dummy values—1s, 10s, 100s—anything that makes it easy to spot incorrect calculations. When you're done, and you're sure the formulas are okay, erase the dummy values and enter your own.**

Make the data cells look different. **When you're playing the what-if game in a dense spreadsheet, it's easy to accidentally enter a data value into a cell that contains a formula. This kind of error doesn't show up right away, but it can cause subsequent changes to yield wrong answers, and it's notoriously hard to detect. To avoid these errors, do something systematic to make the data cells look different: In 1-2-3 for DOS, use */Range • Unprot*, which changes the color of the cell text (in Quattro for DOS, it's */Style • Protection • Unprotect*); in Excel and other Windows spreadsheets, you can format the cells so that data cells have lightly shaded backgrounds or different-color text. If you can distinguish a formula cell from a data cell, you won't overwrite it carelessly.**

Never sign off on a spreadsheet you don't understand. **Today's spreadsheet programs contain lots of exotic analytical tools: statistical tests, solvers, forecasting functions, you name it. Don't simply use this stuff and assume that the answers are truth. Get professional advice, double-check your setup, test your model with a textbook example, do whatever it takes. You know what they say about the word *ass-u-me*.**

program is to set up your spreadsheet as a database, fill in the nonzero quantities, then extract the nonzero rows into a report worksheet for printing. I have discussed the database alternative often in these pages—see "Master Class: When Data Works Best" in December 1993 and Timothy Power's question ("Roll Over, Quattro") in June 1993—so I'll focus here on the macro approach shown in **FIGURE 2**.

To set it up, enter the labels shown in B1..D1, the numbers in B2..C11, and the macro code in C14..D19. In D2, enter whatever formula you use to calculate price (I've used C2*1.3 to assume a 30 percent markup) and copy it into D3..D11. Then use the command */Edit • Names • Create* (in 1-2-3, it's */Range • Name • Create*) and name each of the ranges shown in the table at F1..G4. Then designate the range PRINT as the print range: In Quattro Pro, execute */Print • Block*, press **<F3>**, select *Print* from the menu, and press **<Enter>**. In 1-2-3, select */Print • Printer • Range*, type **PRINT**, and press **<Enter>**, then **<Escape>**. To execute the macro, press **<Alt>-Z**. A sample worksheet is available as SKIPZERO.WK1 on PC World Online.

Here's how the macro works: The range TAGS contains the flags that suppress the rows whose quantity is zero. The macro first clears that range (in column A), then steps down through the column of quantities. When a quantity is zero, the macro puts the cell pointer in the corresponding row in column A and enters the word SKIP, preceded by the nonprinting label prefix |. Quattro or 1-2-3 omits from the printout any row that has such a label in the leftmost column of the print range.

Here are the macro details:

D14: {goto}PRINT~{r}{d} positions the cell pointer at the first value in the column that's named Qty.

	A	B	C	D	E	F	G	H
1		Qty	Cost	Price		PRINT	A1..D12	
2		12	$73.00	$94.90		TAGS	A2..A12	
3		10	$11.00	$14.30		\Z	D14	
4		9	$45.00	$58.50		\Z_1	D16	
5		0	$47.00	$61.10				
6		3	$32.00	$41.60				
7		1	$91.00	$118.30				
8		2	$48.00	$62.40				
9		0	$56.00	$72.80				
10		4	$56.00	$72.80				
11		1	$3.00	$3.90				
12								
13								
14			\Z	{goto}PRINT~{r}{d}				
15				{blank TAGS}				
16			\Z_1	{if @cellpointer("type")="b"}{quit}				
17				{if @cellpointer("contents")>0}{d}{branch \Z_1}				
18				{l}|SKIP~{r}{d}				
19				{branch \Z_1}				
20								
21								

FIGURE 2: WANT TO AVOID PRINTING CELLS whose quantity is zero? A macro trick lets you mark those rows using the nonprinting label prefix \|; then it skips those rows when you print.

D15: {blank TAGS} clears any previous skip tags from column A.

D16: {if @cellpointer("type")="b"}{quit} halts the macro after it has processed the last quantity.

D17: {if @cellpointer("contents")>0}{d}{branch \Z_1} checks to see if the current quantity is more than zero. If it is greater than zero, this statement selects the next cell and returns the macro to D16.

D18: {l}\|SKIP~{r}{d} runs only if the quantity is zero. The statement selects the left adjacent cell, enters the tag \|SKIP, and then selects the next quantity.

D19: {branch \Z_1} returns the macro to D16 to process the next quantity.

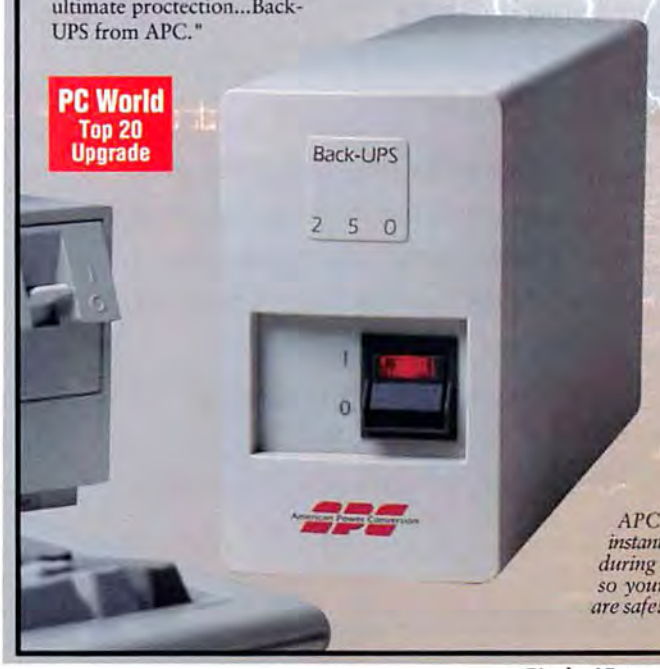
By Richard Scoville

Richard Scoville is a contributing editor for PC World *and a software training consultant based in Chapel Hill, North Carolina.* Spreadsheets *welcomes your questions (see page 12 for contact information).*

Introducing the $139 investment no computer user can afford to be without...

"Don't take chances...Get the ultimate proctection...Back-UPS from APC."

PC World Top 20 Upgrade



Blackouts, brownouts, sags... if you use computers, your bottom line is directly linked to your power line. The fact is, your data and hardware are vulnerable to problems that surge suppressors and power directors just aren't equipped to handle.

Call for your FREE 60 page PC power protection handbook!

Now there's an Uninterruptible Power Supply (UPS) to suit any budget. Back-UPS® are perfect protection for LAN servers, personal computers, phone/fax systems, POS equipment, or any other device that can go down when the power does. If lightning is a concern, Back-UPS are even backed by a $25,000 insurance policy against surge damage to your equipment (see details).

So don't wait for the inevitable power problem to rob your business. Protect your productivity with Back-UPS, available where quality computer products are sold.

APC Back-UPS provide instantaneous battery power during power disturbances, so your data and hardware are safe!

APC™

AMERICAN POWER CONVERSION

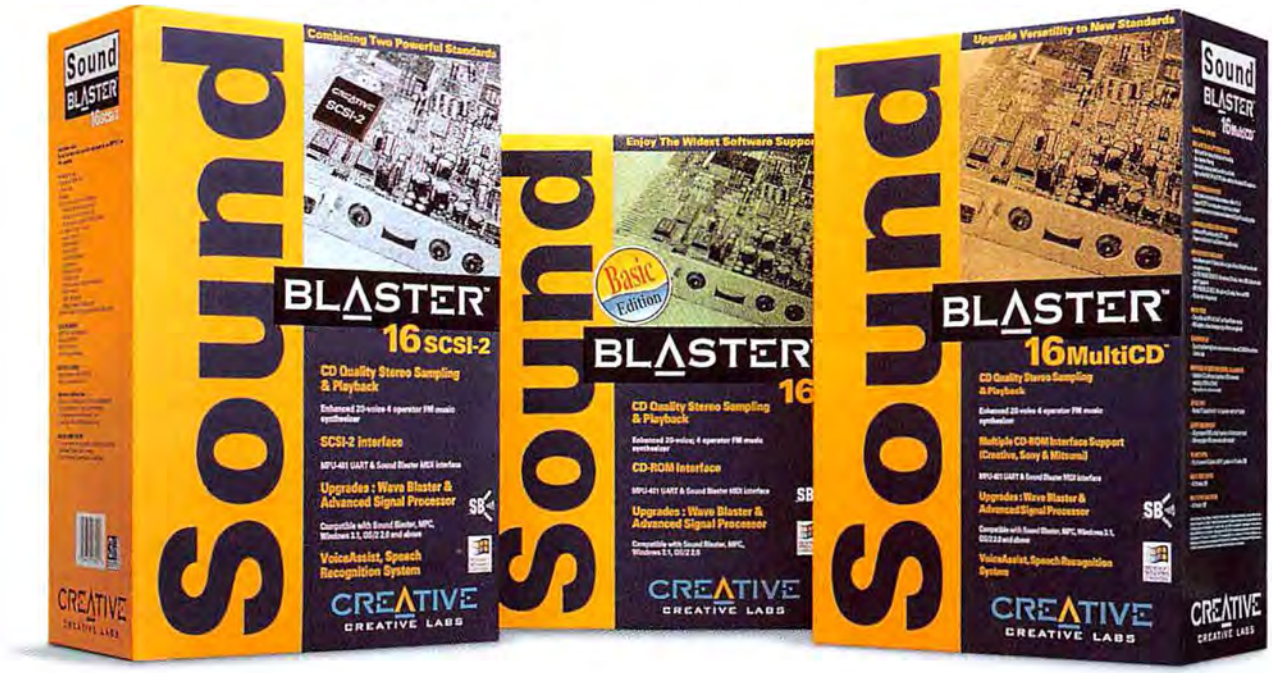
800-800-4APC, dept. P3

Businessweek's #1 Hot Growth Company!(NASDAQ:APCC)

© 1993 Trademarks are property of their respective owners. • Suggested list price.

Circle 45 on reader service card

NO MORE EXCUSES.



NOW THERE'S A 16-BIT SOUND BLASTER FOR EVERY APPLICATION AND BUDGET...AND NO MORE EXCUSES FOR OWNING ANYTHING LESS.

Every day, more people buy Sound Blasters than any other PC audio card. Except for a few of you, who keep putting off that all-important Sound Blaster™ decision. You know who you are. Well, our new line will make you a true believer.

SOUND BLASTER 16 BASIC: MORE VALUE.

For instance, some of you told us you were looking for 16-bit performance, but an 8-bit price.

So our new Sound Blaster 16 Basic offers the same great hardware as our premium models. But in a $199.95* no-frills package that's perfect for the first-time 16-bit user.

SOUND BLASTER 16 MULTICD: MORE CD-ROM OPTIONS.

Perhaps you'd bought another manufacturer's

PC2 Multimedia PC

U.S. inquiries: Creative Labs 1-800-998-5227 or 1-408-428-6600. **International inquiries:** Creative Technology Ltd., Singapore. TEL 65-773-0233 FAX 65-773-0353. Sound Blaster, Creative VoiceAssist, Wave Blaster and the Sound Blaster and Creative logos are trademarks of Creative Technology Ltd.

CD-ROM drive. Probably an oversight, we know, but that's no longer an excuse to deny yourself the finest in PC audio.

Just plug in a Sound Blaster 16 MultiCD. Its format is 100% compatible with best-selling drives from Sony, Mitsumi and Panasonic.

Creative VoiceAssist™ software and microphone provides voice-activated Windows control for Sound Blaster 16 Multi-CD and SCSI-2 packages.

The Sound Blaster 16 MultiCD can even run two different drives at the same time. Which only makes sense, considering our $249.95* price will save you enough money to buy the second one.

SOUND BLASTER 16 SCSI-2: MORE SCSI COMPATIBILITY.

Maybe you were waiting for a full-featured SCSI interface. Well, wait no longer.

As the name implies, our Sound Blaster 16 SCSI-2 meets the new, more comprehensive generation 2 SCSI standards. Others don't.

And our card runs the complete battery of SCSI peripherals, not just CD-ROM. Best of all, it includes one of the most comprehensive software bundles in the business and does it for a remarkable $279.95.*

TRUE "PLUG & PLAY" UPGRADABILITY.

Speaking of things other cards can't do, our unique scalable platform lets you add advanced options as you need them.

So once you stop making excuses

Boost CPU efficiency by up to 65% with an Advanced Signal Processing upgrade.

and get your Sound Blaster 16, upgrading to Wave Blaster™ Sampled Wave Synthesis (courtesy of the MIDI wizards at E-mu) or our own Advanced Signal Processing option (a Creative Labs exclusive) is literally as easy as adding a daughter board or plugging in a chip.

Upgrade MIDI applications and soundtracks to Sampled Wave Synthesis with a Wave Blaster daughter board.

JUST WHEN YOU THOUGHT YOU'D HEARD EVERYTHING...

Along comes Sound Blaster 16. The no-more-excuses sound card. Exactly what you'd expect from Creative Labs, developers of the industry standard 16-bit audio platform.

For more information and the name of your nearest Creative Labs dealer, call 1-800-998-5227.

	Sound Blaster 16 Basic Edition	Sound Blaster 16 MultiCD	Sound Blaster 16 SCSI-2
Format	16-bit stereo	16-bit stereo	16-bit stereo
Advanced Signal Processing Upgradability	Yes	Yes	Yes
Wave Blaster Upgradability	Yes	Yes	Yes
CD-ROM Compatibility	Creative Labs/Panasonic	Sony, Mitsumi, Creative Labs/Panasonic	Any SCSI or SCSI-2
Bundled Hardware		Microphone	Microphone
Bundled Software	Monologue for Windows Creative WaveStudio Creative Soundo'LE Creative Talking Scheduler Creative Mosaic	Software Toolworks Multimedia Encyclopedia HSC InterActive SE PC Animate Plus Monologue for Windows Creative WaveStudio Creative Soundo'LE Creative Talking Scheduler Creative Mosaic Creative VoiceAssist	Software Toolworks Multimedia Encyclopedia HSC InterActive SE PC Animate Plus Monologue for Windows Creative WaveStudio Creative Soundo'LE Creative Talking Scheduler Creative Mosaic Creative VoiceAssist
Suggested Retail	$199.95	$249.95	$279.95
W/Advanced Signal Processing	Not applicable	$299.95	$329.95

Sound BLASTER™ THE 16-BIT SOUND STANDARD. CREATIVE™

CREATIVE LABS, INC.

All other trademarks are the property of their respective holders. © Copyright 1993 Creative Technology Ltd. All rights reserved.*SRP. Note: Sound Blaster 16 MultiCD works with Sony CDU31A; Mitsumi CRMC-LU005 and -FX001; and Creative Labs/Panasonic CR-523 and -563.

WORD PROCESSING Q & A

Fractionating in Ami Pro 3.0

Q I often need to include fractions in my Ami Pro 3.0 documents. While I can insert the fractions ¼, ½, and ¾ using the Windows 3.1 Character Map application, I'd like to be able to use fractions like 7/16 and 17/32, which are not available. I know I could use the Equations editor feature, but this seems like overkill. Is there an easier solution?
Susan R. Taylor, Alameda, California

A The solution to your problem isn't all that difficult, but it requires a written macro since the numbers in your fractions will probably change. To create the macro, first enter the text shown in **FIGURE 1** into a blank Ami Pro 3.0 document. Check your typing carefully, and then select *File•Save As*. In the Save As dialog box, choose the *Ami Pro Macro* entry in the List files of type drop-down list. Next, enter **FRACTION.SMM** in the File name text box, and then click *OK* or press **<Enter>** to save the macro. Or you can download FRACTION.SMM, ready-made, from PC World Online.

Since you'll use this macro frequently, you should probably assign a keystroke shortcut to it. To do this, select *Tools•Macros•Edit*. In the Edit Macro dialog box, highlight the *fraction.smm* entry in the Macros list. Then click in the Playback shortcut keys box and press your desired shortcut key combination. To avoid conflicts with preexisting keystrokes, I suggest using **<Ctrl>-<Shift>-F**. Click *Save* and then *OK* to save your key combination. Finally, select *File•Save* to make your changes permanent. You can then close the window that is displaying your macro codes.

To use the macro in your document, position the cursor, then press **<Ctrl>-<Shift>-F** or whatever shortcut key you assigned. Type the numerator for your fraction in the dialog box that appears, press **<Enter>**, and then type the denominator in the next dialog box and press **<Enter>** again. You'll see your fraction displayed correctly on the editing screen.

Here's how the macro works:

SpecialEffects(64 "") sets up superscript formatting.

Numerator = Query$("Enter your numerator") prompts you for the numerator.

Type({Numerator}) types the numerator variable into your document.

SpecialEffects(0 "") restores normal formatting to the rest of the document.

Type("/") types a slash in the document for your fraction.

SpecialEffects(128 "") sets up subscript formatting.

Denominator = Query$("Enter your denominator") prompts you to type in the denominator.

Type ({Denominator}) types the denominator variable into your document.

SpecialEffects(0 "") restores normal formatting once again.

Type(" "), of course, simply types a space.

```
FUNCTION FRACTION1()
SpecialEffects(64 "")
Numerator = Query$("Enter your numerator")
Type({Numerator})
SpecialEffects(0 "")
Type("/")
SpecialEffects(128 "")
Denominator = Query$("Enter your denominator")
Type ({Denominator})
SpecialEffects(0 "")
Type(" ")
END FUNCTION
```

FIGURE 1: CREATE ANY FRACTION IN AMI PRO with the help of this simple macro instead of the Equations editor.

Getting Ahead With WinWord Envelopes

Q I like to print a year's worth of envelopes for recurring mailings, such as rent and electric bills, at one time. But with Word for Windows 2.0c, I can print only one envelope at a time on my Hewlett-Packard LaserJet Series III printer. Since I have an envelope tray, it should be easy to print all 12 envelopes in a single pass, but I can't figure out how to do it.
Dan Beauzile, Niagara Falls, New York

A Word for Windows can do what you want, although it's not all that obvious how. The problem occurs because direct envelope printing bypasses the Print dialog box, which is where you normally set the number of copies. To print multiple copies on a LaserJet Series II or Series III printer, there's a step that you must take before you click the Envelope icon on the tool bar or execute the Tools•Create Envelope command.

First, select *File•Print Setup*. Then, in the dialog box, with your current printer highlighted, click the *Setup* button. In the next dialog box, enter the number of copies that you want and

USER GROUP TIP

Clean Starts in WinWord

When I load Microsoft Word for Windows from Program Manager, I don't want a new, blank document based on the default template; I just want the program. Here's how I get it: In Program Manager, click on the Word for Windows icon and press <Alt>-<Enter>. In the resulting dialog box, go to the Command Line field, add a space and /N after the file name WINWORD.EXE, and then press <Enter>. The next time you double-click that icon to load Word for Windows, the program will come up without a new, blank document.

Alex Goldfinger
Amateur Computer Group of New Jersey

"If you want to play it really safe just remember one very basic rule: If the product is not Microsoft Mouse-compatible, or Mouse Systems-compatible at the very least, do not buy it."
PC Magazine, July 1993

MICROSOFT® WINDOWS™ COMPATIBLE

1993 ANNUAL WINDOWS 100 MAGAZINE WIN AWARD
PC Trackball II

Lifetime Limited Warranty!

Introducing The Ideal "*MOUSE!*" For All Your Computer Needs.

The "Mouse!" lets you re-assign the buttons for right- or left-handed use!

PERFORMANCE The "Mouse!" is a high-resolution, two-button mouse that gives you pin-point accuracy! ***QUALITY*** Featuring a sleek ergonomic design, the "Mouse!" has been engineered to the most exacting standards. Quality so good, we back it with a lifetime limited warranty!

COMPATIBILITY The "Mouse!" is 100% Microsoft Windows compatible and works with all IBM PC, XT, AT, and compatible computers! ***VALUE*** Only $24.95 (MSRP)

For A Dealer Near You Call
(800) 886-MICE
Fax Back Product Information
(800) RU-MOUSE

MOUSE SYSTEMS®
"The Most Accurate And Reliable Mice Since 1982!"

Copyright 1993, Mouse Systems Corporation. All registered and unregistered trademarks belong to their respective companies

Circle 160 on reader service card

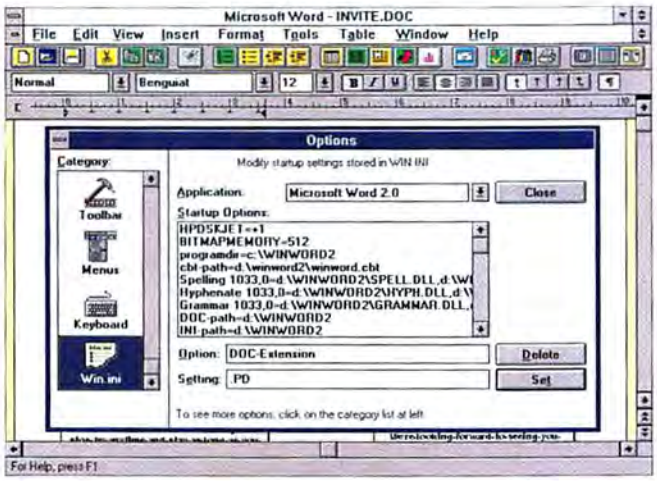


FIGURE 2: CHANGE THE DEFAULT EXTENSION for your WinWord document files to any DOS extension using the Tools • Options command.

then select *OK* twice to return to your document.

If you don't see a Copies field, it may be because your printer doesn't support multiple copies in this way. If that's the case, you'll have to print your envelopes one at a time.

Now click the *Envelope* icon or select *Tools•Create Envelope*. Fill in your address information and then select the *Print Envelope* button. You'll get however many copies of the envelope you specified during the previous step. Just be sure to put your envelope tray in the printer before beginning the print job.

A final note: If your printer tells you to insert an envelope manually, select *Tools•Options* before the next envelope printing session. Choose the *Print* icon in the Category list, and check the *Printer's Envelope Feeder has been Installed* option. With that box checked, your printer will feed from the envelope tray automatically.

Changing Default File Extensions in WinWord

Q I'd like to change the default DOC extension in Word for Windows 2.0c to my initials. This would make my documents easier to find, but typing in that extension each time I want to load or save a file is tedious. Can you help?
Patrick Dunphy, Joinville, Brazil

A Sure. With Word for Windows running, select *Tools•Options*. Choose the *Win.ini* icon in the Category list. Next, click inside the Option text box, and change the current text so that it reads **DOC-Extension**. Then you click inside the Setting text box, delete the old text, and type **.PD** or whatever other extension you want to use as a default (see **FIGURE 2**). Finally, check your typing and then click the *Set* button followed by *Close* to save the settings and return to your document.

For this change to take effect, you will have to restart Windows. Once you do, you will find that your new extension has become the default and will show up whenever you select File•New, File•Open, File•Save, or File•Save As.

Squeezing Text in WordPerfect 5.1 for DOS

Q From time to time, I need to compress a block of text in order to make it fit into a smaller space. I have been choosing a smaller font size whenever possible, but with fixed fonts such as my laser printer's Courier, this approach will not work. Do you know if there is anything that I can do to tighten things up?
Sid Fleischer, Boise, Idaho

A Great question. Start by positioning the cursor at the spot where you want to begin tightening up text. Then press **<Shift>-<F8>463**. If you're using drop-down menus, select *Layout•Other•Printer Functions•Word Spacing*. Now you're ready to begin changing either the spacing between words or the spacing between individual letters. In most cases, it's best to change both equally.

To tighten up the word spacing, press **3** or select *Percent of Optimal*. Type in a value that represents a percentage of the original spacing, then press **<Enter>**. A good starting value is 90 percent. Repeat the same process in the menu for letter spacing, using the same value. When you're done, press **<F7>** to return to the editing screen. Notice that you can stretch text as well by entering a value larger than 100.

If you want the entire document to be compressed, you're finished. However, if you want to compress just part of the document, move the cursor to the end of the text to be compressed and repeat the steps above, setting the word and letter spacing to their *Normal* or *Optimal* values. But don't try to use these commands on a marked block of text; they won't work.

WordPerfect 6.0 Button Navigation

Q I love the new multiple button bars in WordPerfect 6.0 for DOS, but displaying a different button bar is a pain. You either have to plow through menus or use the button marked BBar Sel, which is a standard feature on the program's stock button bars. But using BBar Sel requires scrolling all the way to the next line of buttons. Is there a way to fix this?
Alan Bridges, Philadelphia

A Sure. You can move any button to any position on its bar. I would advise making the BBar Sel button the first button on every bar to make navigation easier.

First, select *View•Button Bar Setup•Select*, highlight the button bar that you would like to modify, and click *OK*. Next, select *View•Button Bar Setup•Edit*. Scroll down the list of buttons in the dialog box that appears, and then highlight *BBar Sel*. Now select *Move Button*.

Scroll back up to the top of the list of buttons, and highlight the first button. Select *Paste Button* to insert the BBar Sel button at the top of the list. Click *OK* or press **<Enter>** to finish the job and store the new arrangement as the default. Repeat this operation for each button bar, and you'll always have instant access to your entire list of specialized button bars.

By George Campbell

George Campbell is a contributing editor for PC World. Word Processing *welcomes your questions. See page 12 for contact information.*

PUT YOURSELF ON SPEAKING TERMS WITH YOUR COMPUTER.

VOICEASSIST.

There's a new way to communicate with your PC–just *tell* it what to do. In plain English. And, with Creative VoiceAssist,™ it will.

NOW YOUR PC CAN RESPOND TO SPOKEN COMMANDS.

COMMAND YOUR PC WITH YOUR VOICE.

Creative VoiceAssist is a sophisticated speech recognition tool that lets you provide input to Windows™ 3.1 applications without lifting a finger.

Everything you need is right in the box: full compatibility with every major brand of sound card,* pre-trained command set for male and female voices...even a high-fidelity microphone.

JUST SAY THE WORD.

Unlike other software solutions, there's no need to worry about being understood: thanks to our hassle-free training, it's easy to get outstanding recognition accuracy.

And, with a total capacity of 1,024 commands per application–almost 30,000 commands total–there's no danger of running out of vocabulary anytime soon.

Which is fortunate. Because once you see how easily VoiceAssist manages everything from simple instructions to complex macros, you'll want to use it for word processing, spreadsheets, databases...just about everything.

But let's be honest. Amazing as it is, VoiceAssist isn't going to replace your mouse or keyboard. What it *will* do is add hands-free control to your applications...for as little as $70.** And that's enough to take the words right out of your mouth.

For more information about Creative VoiceAssist, call 1-800-998-5227.

CREATIVE™
CREATIVE LABS, INC.

*Sound Blaster or equivalent sound card with Windows audio drivers and microphone jack. **SRP $99.95. Dealer prices are currently as low as $69.00 and may vary. **U.S. Inquiries:** Creative Labs, Inc., Tel: 1-800-998-5227 or 1-408-428-6600. **International Inquiries:** Creative Technology Ltd., Singapore, Tel: 65-773-0233, Fax: 65-773-0353. Creative VoiceAssist and the Creative logo are trademarks of Creative Technology Ltd. All other trademarks are the property of their respective holders. © Copyright 1993 Creative Technology Ltd. All rights reserved.

Circle 54 on reader service card

Solve Your PC Problems with the Latest Books from IDG!

OVER 5,008,325 DUMMIES BOOKS IN PRINT!

Hot New Computer Books from the Publisher of the #1 Bestsellers *DOS For Dummies®* and *Windows 3.1 SECRETS™*!

...For Dummies™ Books are the fun an easy way to learn about computers!

DOS For Dummies, 2nd Edition
by Dan Gookin
The all-time favorite DOS reference!
1-878058-75-4
$16.95 US/$21.95 Canada

The Internet For Dummies™
by John Levine
A fun and easy approach to today's popular on-line service.
1-56884-024-1
$19.95 US/$26.95 Canada

Upgrading & Fixing PCs For Dummies™
by Andy Rathbone
Your hands-on reference on what to fix and how to fix it, adding memory and more!
1-56884-002-0
$19.95 US/$26.95 Canada

Quicken For Windows For Dummies™
by Steve Nelson
Get your finances under control with Quicken 3 the fun and easy way!
1-56884-005-5
$16.95 US/$21.95 Canada

IDG's Top Ten ...For Dummies Books

Perfect Stocking Stuffers!

1. DOS For Dummies, 2nd Edition
2. Windows For Dummies
3. PCs For Dummies
4. WordPerfect 6 For Dummies
5. WordPerfect (4.2-5.1) For Dummies
6. 1-2-3 For Dummies
7. Excel For Dummies
8. Macs For Dummies
9. Word For Windows For Dummies
10. Illustrated Compu Dictionary For Dumm

PC World WordPerfect 6 Handbook
by Greg Harvey
All-new tutorial, reference, and software toolkit to WordPerfect 6.0. Bonus disk features custom macros & button bars, fonts, clip art, and more!
1-878058-80-0
$34.95 US/$44.95 Canada

PC World DOS 6 Handbook, 2nd Edition
by John Socha, Clint Hicks, & Devra Hall
This bestseller features a complete DOS command reference and tutorial plus over a dozen DOS utilities on disk!
1-878058-79-7
$34.95 US/$44.95 Canada

PC World Microsoft Access Bible
by Cary Prague & Michael Irwin
Your complete tutorial, reference, and software toolkit to Microsoft's hot new Windows database! Includes a complete, customizable database application on disk.
1-878058-81-8
$39.95 US/$52.95 Canada

Network Security SECRETS™
by David Stang & Sylvia Moon
Finally, an expert guide to creating and maintaining secure networks! Covers NetWare, LANtastic, VINES, LAN Manager; DES, RSA & DSS data encryption, and more! Includes two disks of valuable security utilities.
1-56884-021-7
$49.95 US/$64.95 Canada

IDG BOOKS The World of Computer Knowledge

...From IDG Books or wherever computer books are sold. Or call 1-800-762-2974.

In Canada, call Macmillan of Canada at 416-293-8464, Ext. 340

SECRETS AND ...FOR DUMMIES ARE TRADEMARKS, AND DOS FOR DUMMIES IS A REGISTERED TRADEMARK, OF INTERNATIONAL DATA GROUP.

IDG Books Worldwide, Inc.
155 Bovet Road, Suite 310
San Mateo, CA 94402
(415) 312-0600
(415) 358-1260 Sales Fax

Look for IDG Books at These Fine Stores

Look for IDG Books Nationwide at:
B. DALTON
BARNES & NOBLE
BOOKSTOP/BOOKSTAR
BORDERS
COMP USA
CROWN/SUPER CROWN
ENCORE BOOKS
SOFTWARE ETC.
WALDENBOOKS
WALDENSOFTWARE

Selected Titles Available at:
ELECTRONIC BOUTIQUE
OFFICE DEPOT
OFFICE MAX
STAPLES

Arizona

MESA
Bits & PCs Computers and Software
PHOENIX
Bits & PCs Computers and Software
Electronic Materials & Computers
TEMPE
Arizona State Univ. Bookstore
Computer Books 4 Less
Computer Library
TUCSON
Arizona Bookstore
ASUA Bookstore
Computer Supply Specialists
Computermart
Electronic City
The Book Mark

Northern California

BERKELEY
Cody's Books
Moe's Bookstore
PC•Ten Computers
Whole Earth Access
Winners Circle Systems
CAMPBELL
The Booksellers
CAPITOLA
Capitola Book Cafe
CHICO
A.S. Bookstore
Computer Warehouse
Tower Books
CITRUS HEIGHTS
D+G Connecting Point Computer Center
Tower Books
CLAREMONT
Huntley Bookstore
CONCORD
Tower Books
Whole Earth Access
CUPERTINO
A Clean Well-Lighted Place For Books
Stacey's
DAVIS
U.C. Davis Bookstore
ELK GROVE
Computer Adventure
GRASS VALLEY
Four Seasons Card & Book
HAYWARD
Cal State-Hayward/Pioneer Bookstore
LARKSPUR
A Clean Well-Lighted Place For Books
MENLO PARK
Kepler's Books
MILPITAS
Town Center Book Gallery
MONTEREY
PC People
MT. VIEW
Printers, Inc. Bookstore
Tower Books
PALO ALTO
Printers, Inc. Bookstore
Stacey's
PETALUMA
Buerg Software & Computers
REDWOOD CITY
Computer Attic
ROHNERT PARK
Copperfield's Books
ROSEVILLE
Soft*Shop
SACRAMENTO
Computer Warehouse
D+G Connecting Point Computer Center
Sacramento State/Hornet Bookstore
Tower Books (all locations)
Whole Earth Access
SALINAS
Computer Works
SAN FRANCISCO
A Clean Well-Lighted Place For Books
San Francisco State/Franciscan Shop
Stacey's
Whole Earth Access
SAN JOSE
Spartan Shops/San Jose State University
Whole Earth Access
SAN MATEO
Whole Earth Access
SAN RAFAEL
Whole Earth Access
SANTA CRUZ
Bookshop Santa Cruz
SANTA ROSA
Bits & PCs
Copperfield's Books
Superior Computers
SEASIDE
Computer Works
SEBASTOPOL
Copperfield's Books
SONOMA
Sonoma Bookends
STANFORD
Stanford Bookstore
STOCKTON
Computer Warehouse
SUNNYVALE
Action Computers & Surplus
Weirdstuff Warehouse

Southern California

ALHAMBRA
Alhambra Bookstore
ARCADIA
Vromans Bookstore
ARROYO GRANDE
Books West
BAKERSFIELD
Books West
BURBANK
P.C. Book Nook
ESCONDIDO
PC Warehouse Computers
FULLERTON
Cal State Fullerton-Titan Shops
GLENDALE
Computer Palace
IRVINE
Irvine Sci-Tech Books
U.C.I. Bookstore/Univ. of California
LAKE FOREST
Software City
LOMPOC
Books West
LONG BEACH
University Bookstore: Cal State Long Beach
LOS ANGELES
ASUCLA Bookstore & Luvalle Commons
OPAMP Technical Books
University of Southern California Bookstore
MORENO VALLEY
Minco Computers
NORTHRIDGE
Cal State Northridge/Matador Bookstore
OCEANSIDE
Computer Books 4 Less
PASADENA
Caltech Bookstore
Vromans Bookstore
RIVERSIDE
U.C. Riverside Bookstore
SAN DIEGO
Byte + Floppy Computers
Byte Gallery
Computer Time
Datel Systems
San Diego State University/Aztec Shops
San Diego Technical Books, Inc.
SAN LUIS OBISPO
Books West
Earthling Bookshop
SAN MARCOS
Datel Systems
SANTA ANA
Advanced Computer Products
SANTA BARBARA
Chaucer's Bookstore
Earthling Bookshop
SANTEE
Datel Systems
WEST LOS ANGELES
Unitek Computer Stores

Colorado

DENVER
Tattered Cover
ENGLEWOOD
SoftPro Books

Connecticut

NEW HAVEN
Yale Coop

District of Columbia

Reiter's Scientific and Professional Books
Sidney Kramer Books

Florida

BOCA RATON
Liberties

Georgia

Micro Center (all locations)
ATLANTA
Chapter Eleven Bookstores
Oxford Bookstore

Illinois

CHAMPAIGN
Pages For All Ages Bookstore Inc.
TIS Bookstore
CHICAGO
University of Chicago Bookstore
Waterstone's
NAPERVILLE
Books & Bytes

Indiana

BLOOMINGTON
Morgenstern Booksellers

Iowa

AMES
Iowa State University/University Bookstore

Kansas

LAWRENCE
University of Kansas/Kansas Union Bookstore

Maryland

COLLEGE PARK
Maryland Book Exchange

Massachusetts

BOSTON
Boston University Bookstore
Museum of Science Shop
BROOKLINE
Brookline Booksmith
CAMBRIDGE
Accessories Plus
Harvard Coop
MIT Coop
Quantum Books
Wordsworth
NEEDHAM
You-Do-It Electronics
WESTBORO
Whiz

Minnesota

ARDEN HILLS
Zeos Computer Factory Outlet

Missouri

COLUMBIA
University of Missouri/University Bookstore
ST. LOUIS
Citybooks
The Library, Ltd.

New Hampshire

HANOVER
Dartmouth Bookstore

New England

Royal Discount Bookstores (all locations)
Lauriat's (all locations)

New Jersey

HACKENSACK
Womraths

New York

Lauriat's (all locations)
BRIARCLIFF MANOR
Books & Things
HUNTINGTON
Book Revue
MT. KISCO
Fox & Sutherland
NEW YORK
Barnes & Noble (18th Street & 5th)
Classic Bookshops
Coliseum Books, Inc.
Columbia University Bookstore
Computer Book Works
Cooper Square Books
J&R Computer World
McGraw-Hill Bookstore
New York University Book Center
ROCHESTER
The Paper Cutter
The Village Green Bookstore, Inc.
World Wide News

Ohio

Micro Center (all locations)
CINCINNATI
University of Cincinnati Bookstore
COLUMBUS
The Ohio State University Bookstore
DAYTON
Books & Company
FAIRBORN
Wilkie's Fairborn

Oregon

PORTLAND
Tower Books

Pennsylvania

Micro Center (all locations)
MONTGOMERYVILLE
Atlantic Book Shops
PHILADELPHIA
Quantum
The University of Pennsylvania Bookstore
PITTSBURGH
University of Pittsburgh/The Book Center
STATE COLLEGE
Svoboda's Books
UNIVERSITY PARK
Penn State Bookstore
WEST CHESTER
Chester County Book Company

Rhode Island

PORTSMOUTH
Mac & PC Shop
PROVIDENCE
Brown University Bookstore
College Hill Bookstore
WARWICK
Software Center of R.I.

Texas

ARLINGTON
Taylor's Technical Books
Univ. of Texas/Arlington Bookstore
DALLAS
Taylor's Technical Books

Utah

PROVO
BYU Bookstore
SALT LAKE CITY
Deseret Book Co.
Sam Weller's Zion Bookstore

Virginia

Micro Center (all locations)

Washington

LONGVIEW
The Computer Store
SEATTLE
University Bookstore

Wisconsin

MADISON
The University Bookstore
MILWAUKEE
Schwartz

CANADA

All locations:
A Plus Software
The Book Company
Coles
Future Shop
Smithbooks

Alberta

All locations:
London Drugs
Overwaitea/Save-On Foods
EDMONTON
Edmonton Computer Books

British Columbia

All locations:
London Drugs
Overwaitea/Save-On Foods

Quebec

MONTREAL
Camelot Computer Bookstore, Place Ville Marie
Camelot Computer Bookstore, Place Phillips
MC Cubed Computer Books

Ontario

TORONTO
Toronto Computer Books
World's Biggest Bookstore

Ottawa

Odyssey Computer Books & Software

Nova Scotia

HALIFAX
Roswell Computer Books

IDG BOOKS

The World of Computer Knowledge

For more information call
1-800-762-2974

WINDOWS Q&A

Swap Files and DoubleSpace—NOT

Q I just got DOS 6.0, and I plan to compress my hard disk using DoubleSpace. But I've heard that you should never create a permanent Windows swap file on a compressed drive. Is this true?

Norma Cathcart, Los Angeles

A All too true. An easier approach is to create the permanent swap file first, exit Windows, and *then* run DoubleSpace. DoubleSpace will automatically detect the swap file and leave it on the uncompressed drive.

However, if you've already done the reverse, you'll have to untangle a few things. After you've created the swap file on a compressed drive, Windows will tell you that 'the permanent swap file is corrupt' and ask if you want to delete it. Press **Y**, and when you're back in Windows, open *Control Panel* and select *386 Enhanced*•*Virtual Memory*. When Windows asks if you want to 'Set corrupt file to zero length now?' click *Yes*. Then click *Change*, and in the New Settings section of the Virtual Memory screen, select *None* from the Type list. Confirm your actions when Windows asks you to, and restart Windows.

To create a swap file without tears, do the following: Run DOS's disk defragger (or one that's compatible with DOS 6.*x*) on the uncompressed drive to pull together as much free contiguous disk space as possible. Load Windows, click your way back into the Virtual Memory screen, select the uncompressed drive for your permanent swap file, select *Permanent* from the Type list, and click *OK*. When you reload Windows, you'll find that your swap file is in the right place.

If you need to allocate more space to the uncompressed drive for a swap file, exit Windows and type **DBLSPACE** at the DOS prompt. Select the compressed drive to shrink, and choose *Drive*•*Change Size*. In the Change Size dialog box, specify a New Free Space on the uncompressed drive that's large enough to accommodate a permanent swap file of the desired size, and click *OK*. Then run Windows and follow the procedure already described to create the swap file.

Trimming the Driver List

Q When I run the Windows Setup utility and select Options•Change System Settings•Display, I see tons of video drivers that I don't need. I've gone through the WINDOWS\SYSTEM directory and deleted drivers that I recognize, but they still appear in Setup's Display list. How can I remove them from the list permanently?

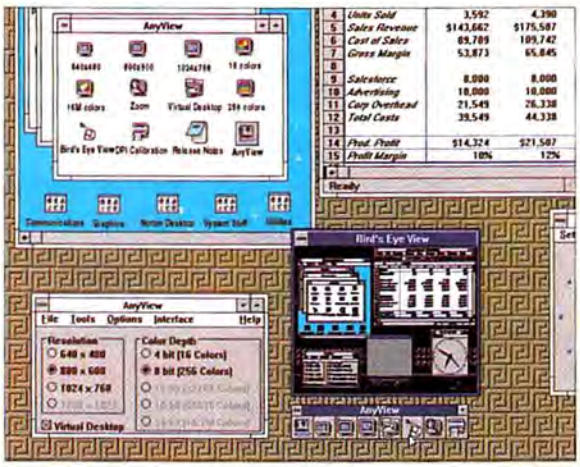
Alan S. Ayer, Houston, Texas

A You need to update the Display list information, typically found in the SETUP.INF file in the WINDOWS\SYSTEM directory. After making a backup of the file, open SETUP.INF with Windows Write or any text editor (the file may be too big for Notepad), locate the [display] section, and place a semicolon at the beginning of the line where a deleted driver is referenced (a semicolon at the beginning of a line tells Setup to ignore that line). There's a lot of clutter in this file, so search for the name as shown in the Display list, such as 'Video 7 512K, 640x480 256 colors driver'. You'll find the name in quotes and preceded by something like 'v7vga = 2:v7vga.drv'. Type a semicolon at the start of the line, repeat this for every deleted driver, and then save SETUP.INF as text only. The next time you run Windows Setup, you won't see the deleted drivers listed. If you ever need them, just remove the semicolons from SETUP.INF.

Even if you delete your drivers, don't delete their lines from SETUP.INF. By commenting a line out with a semicolon, you can add it back to the list later by simply removing the semicolon. When you select a deleted driver in the Display list, Windows will prompt you for the disk containing the driver.

If you can't find a driver listed in SETUP.INF, chances are it came from a third-party vendor. Look for other INF files in the WINDOWS\SYSTEM directory. These typically begin with OEM and end with the INF extension, such as OEMPANA.INF. To remove

Windows Toolbox



Tired of restarting Windows every time you switch between VGA, super VGA, or higher screen resolutions? Do you lack a full-page monitor for your page layout, drawing, or CAD work? Then you'll love AnyView. AnyView can switch among 640 by 480, 800 by 600, 1024 by 768, and 1280 by 1024 resolutions instantly, assuming your hardware supports them. You can enlarge any section of the screen with a click, pan around just by moving the mouse, and create a "virtual desktop" that's three times the size of your regular desktop. To move quickly, display the Bird's Eye View of the desktop and just point and click to where you want to go. You can even change the number of on-screen colors if you don't mind restarting Windows. AnyView lists for $79.95. Binar Graphics, Inc., 415/491-4182, 415/491-1164 (fax).

Reader service no. 637

EVEN THE BEST EQUIPMENT NEEDS SOLID SUPPORT.

SOUNDMAN 16. THE BEST SUPPORTED CD-QUALITY SOUND BOARD IN THE BUSINESS.

SoundMan™ 16 is endowed with 7 day-a-week technical support, a 3-year free replacement warranty, a limited lifetime warranty, and discount hardware upgrades. SoundMan includes 16 bit, 44.1 KHz sampling/playback, a 20-voice Yamaha OPL-3 stereo synthesis chip, sound-enhanced jumperless installation, and a bundle of multimedia titles including MCS MusicRack, Screen Craze II and ICON Hear-IT Lite. It's guaranteed 100% SoundBlaster™ and AdLib® compatible, and is the only 16-bit sound board backed by Logitech's reputation for quality and service. Pick one up at your local dealer, or call **1-800-231-7717.**

LOGiTECH

™/® Trademarks belong to their respective owners.

The Senseware™ Company

Circle 122 on reader service card

the driver listings, you can edit the vendor's INF file using the steps outlined previously, or delete it. If you do the latter, first copy the INF file onto a floppy—you may need it if you change your mind or get a new video board from the same manufacturer.

Wild Cards and File Manager

Q I've found that manually deleting a lot of files when I'm in File Manager can take what seems like forever. Is there a way that I can speed up the process using DOS-like wild cards?
Vinay Mehta, Lennoxville, Quebec, Canada

A Many File Manager commands—including Move, Copy, Delete, Rename, Search, Select Files from the File menu, and View•By File Type—accept the wild-card characters ? and *.*. For instance, to copy all of the current directory's TXT files to drive B:, select *File•Copy* (or press **<F8>**), type ***.TXT** in the From box and **B:** in the To box, and press **<Enter>**. You can even use multiple file names or extensions, separated by spaces or commas, although these won't work in the To boxes for the Copy, Move, and Rename commands.

The Select Files command is especially handy because it leaves the dialog box open while you fiddle with parameters. Say you want to delete all WRI and TXT files in a directory. Choose *File•Select Files*, type ***.WRI *.TXT** in the text box, and click *Select*. File Manager will select all of the WRI and TXT files in its active window's Directory pane. If you decide to deselect a specific file or file type, just type the file name (JONES.WRI) or file type (such as *.TXT or REPORT*.*) in the text box and click *Deselect*. When you're done, click *Close* and take the desired action, such as dragging the selected files to another folder or pressing the <Delete> key.

If you don't need to review selected files, simply select *File•Delete*, type ***.WRI *.TXT**, and click *OK*. To speed things up further, choose *Options•Confirmation*, and uncheck the File Manager prompts you don't want.

Unfortunately, File Manager dialog boxes can't accept most DOS switches; for instance, you can't use /v to verify the accuracy of a copy. But you can print unformatted ASCII text files quickly with the Copy command. Select the file, choose *File•Copy*, type the port name (such as **LPT1**) in the To box, and click *OK*. You may have to press the printer's formfeed button in order to eject the page.

Adjusting Task Manager's Tile Style

Q I use File Manager's drag-and-drop talents to add new icons to Program Manager or to open files in currently running programs, and I pop up the Task Manager and press the Tile button to arrange File Manager alongside the other windows. But this arrangement obscures much of the file list. Is there a way I can tile windows top to bottom instead of left to right?
Bruce Benson, Taos, New Mexico

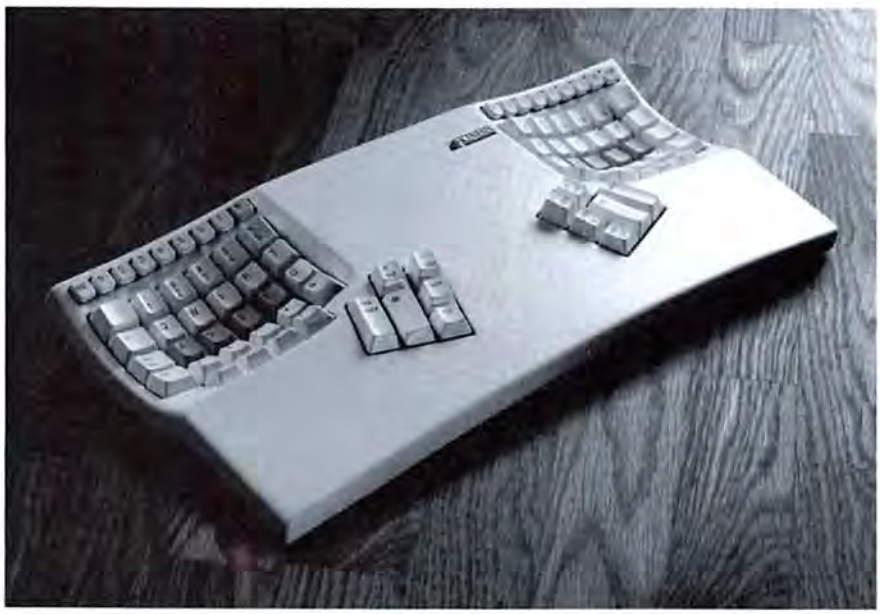
A No problem. Press **<Ctrl>-<Esc>** to display Task Manager, and hold down **<Shift>** while clicking *Tile*. The windows will be arranged top to bottom.

Unfortunately, this trick won't work if you

SAVE THE WORKOUT FOR THE GYM

TRADITIONAL KEYBOARDING CAN BE A REAL WORKOUT. TWISTING WRISTS, ARCHING FINGERS, STRETCHING HANDS: THE USUAL GYMNASTICS. BUT WITH A KINESIS® KEYBOARD, KEYING'S NO SWEAT. YOUR KINESIS KEYBOARD WORKS WITH YOU, HOWEVER YOU WORK:

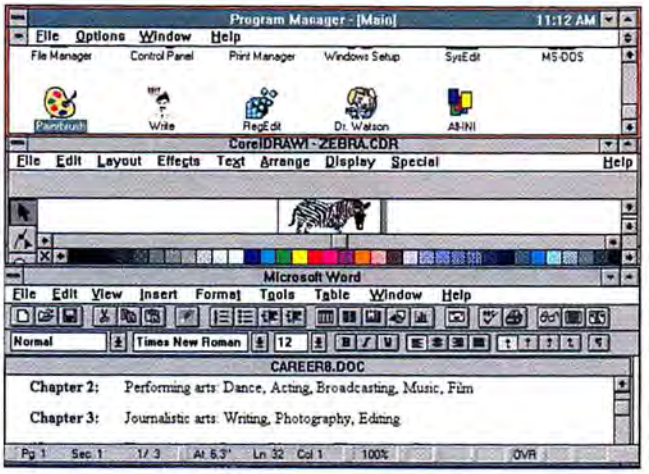
IN QWERTY, DVORAK OR A KEY LAYOUT YOU DESIGN. WITH ENERGY-SAVING MACROS. PALM RESTS. FOOT SWITCHES. FOR KEYBOARDING MINUS THE WORKOUT, CALL 800.454.6374. USE A KINESIS KEYBOARD FOR A MONTH. IF IT DOESN'T WORK OUT, WE'LL REFUND YOUR MONEY.



KINESIS CORPORATION

915 118TH AVENUE SE | BELLEVUE WA 98005 | 800.454.6374 | FAX 206.455.9233

Circle 118 on reader service card



TILE WINDOWS YOUR WAY, top to bottom instead of left to right, using the <Shift> key and the Task Manager's Tile button.

have more than three windows open. If you do, simply minimize the windows that aren't involved in your dragging task.

Lasso Them Wandering Icons

Q One thing I hate about Windows is its floating icons. When I double-click an icon, the mouse sometimes slips and the icon is nudged to the side. Can I fix my icons in place, and still be able to move them later if necessary?

John Spano, Kalamazoo, Michigan

A The simplest way to straighten up icons in Program Manager is to select *Window•Arrange Icons*. A more automatic approach: Go to the Options menu and make sure *Auto Arrange* is checked. Either of these commands snaps the icons to a predefined spacing grid; you can change the grid under the Icons in the Desktop section of the Control Panel.

Taming minimized icons on the desktop is trickier. One method is to slow down the double-click speed, allowing Windows to ignore icon movement between the first and second click.

To set the double-click speed, launch Control Panel, double-click Mouse, locate the Double Click Speed scroll bar, move the scroll box all the way to the 'Slow' side, and click *OK*.

If this doesn't do it, try adjusting WIN.INI to expand the area around an icon that's double-clickable. In Program Manager select *File•Run*, type **WIN.INI**, and press **<Enter>**. Locate the DoubleClickHeight= and DoubleClickWidth= statements inside the [windows] section, and increase their values to 20 or 30 (they'll probably both be set at 4). If these lines aren't present, type them in. Save the file, restart Windows, and your icons will never mosey off the ranch again.

By Scott Dunn

Scott Dunn is a contributing editor for PC World *and coauthor of* 101 Windows Tips *(Peachpit Press, Berkeley, California, 1992).* Windows *welcomes your questions. See page 12 for contact information.* ■

COMING UP

- **System Reviews Get a New Look**

Starting in February, our system reviews will be more informative than ever and cover more of the newest PCs available. Our new rankings for the Top 20 budget and Top 20 power systems will give you the big picture on the best deals you can find.

- **Windows Spreadsheets Learn New Tricks**

Improved ease of use, multidimensional analysis, and workgroup features star in the latest versions of 1-2-3, Quattro Pro, Excel, and Improv. Our comprehensive review reveals which of these programs offer the most effective balance of features and usability to meet your needs.

Plus:

- **Business Shareware—42 Low-Cost Programs**
- **Tax Software—Will It Help or Hinder You?**
- **Special Mobile Computing Section on PCMCIA Cards**
- **Tips on maximizing your 386's performance, indexing documents in WordPerfect, recording Windows macros, and more!**

PC WORLD

OS/2 Q&A

High Resolution Video Drivers

Q I recently switched to a super-VGA video card. OS/2 2.1's installation seemed easy enough at first, but about halfway through I got a dialog box with the option to 'Install Using Display Adapter Utility Program'. What does this mean?

Tim Bartz, St. Paul

A OS/2 needs to know about your hardware, and your graphics card probably came with a utility that helps the operating system find out. To install a new video driver, start by typing **DSPINSTL** at an OS/2 command prompt.

In the resulting dialog box, click *Primary Display* to put a check mark next to it, then click *OK*. This will bring you to another dialog box where OS/2 will ask you for your video chip type; the default that OS/2 selects for you is usually correct, so just click *OK*. The third dialog, Monitor Configuration/Selection Utility, asks for the utility program.

So what is this utility OS/2 is asking for? When you bought your super-VGA video card, it probably came with a disk full of device drivers, utilities, and demonstration programs. One of those programs is a DOS utility—probably called something like SETVGA or VMODE—that lets you set your resolution and other video options. OS/2 needs this information to confirm which video chip your graphics card uses, the resolution you want to run, and whether you need an interlaced display.

If you have such a program available and know where it is, select *Install Using Display Adapter Utility Program* and click *OK*. Then enter the path and file name of your DOS video card utility program. Your screen may buzz and flicker a few times as OS/2 runs the utility and checks the video card settings (you can later confirm that OS/2 detected the correct video chip by going to a full-screen DOS session and typing **SVGA Status**). You'll then see a dialog box from which you can choose your display resolution. After you choose one and click *OK*, OS/2 will prompt you for the proper disks to insert for the driver. When the installation is finished, shut down your system and reboot for the changes to take effect.

Never Use the Reset Button

Q I know that I should run OS/2's Shutdown command before turning off my computer, but sometimes my system locks up and I have to use the Reset button or press <Ctrl>-<Alt>-<Delete>. When that happens, sometimes I lose the data I'm working on, and sometimes I don't. What's up?

Janet Cyr, Dallas

A Under DOS, there's usually no significant difference between hitting the Reset button and pressing <Ctrl>-<Alt>-<Delete>. This isn't true with OS/2, however.

To improve performance, OS/2 has a disk cache that stores data in memory before writing it to your hard disk. But what do you think happens if the data is still waiting in memory when you reset your computer? The data vanishes.

OS/2 is smart enough to trap <Ctrl>-<Alt>-<Delete>. When you press these keys, you get the message 'The system is rebooting...', showing that OS/2 has trapped your keystrokes. OS/2 then flushes out the cache and saves the changes to disk before shutting down.

On the other hand, when you press the Reset button, your PC is reset beyond OS/2's control, and anything that was in memory—including your changes—simply disappears.

The moral of the story is to avoid the Reset button at all costs. Use the Shutdown option whenever you can, but when OS/2 locks up, try pressing **<Ctrl>-<Alt>-<Delete>** first.

Moving Windows

Q Sometimes a window or dialog box ends up off screen and I can't retrieve it with the mouse. How can I get it back?

Patti Crocker, Vacaville, California

A You can't move a window with your mouse if you can't click on its title bar, and under certain circumstances—for instance, when you change video resolutions—a title bar can disappear off the edge of the screen. There are two ways to move a window if this happens to you.

If you have only one problem window, click on it to make it active, then press **<Alt>-<F7>**. You can then move it with the cursor keys or mouse. Press **<Enter>** when you're done.

If you have a number of errant windows, press **<Ctrl>-<Esc>** to bring up the Window List, then hold down the **<Ctrl>** key as you click on all the entries you want to move. Right-click one of the highlighted entries to bring up the pop-up menu, and select *Cascade* or *Tile* to rearrange only the selected items.

By Lou Miranda

Lou Miranda is an OS/2 programmer-consultant based in Minneapolis/St. Paul. OS/2 welcomes your questions. See page 12 for contact information.

From Windows to OS/2

TERMINATING A MISBEHAVING APP: One of the best things about Windows 3.1 is the way you can kill an malfunctioning program with the <Ctrl>-<Alt>-<Delete> "three-fingered salute." But pressing those three keys in OS/2 will reboot your system.

Luckily, there is a simple way to terminate unwanted applications in OS/2: Press <Ctrl>-<Esc>, then wait. If the application is truly tying up the system and not responding to system requests, you'll eventually get a dialog box stating just that. Then you just press <Enter> to kill your application.

If your application is still alive out there, you'll get the Window List that <Ctrl>-<Esc> usually brings up. You can still terminate the application (without saving any data) by right-clicking the application name to bring up the pop-up menu, and selecting Close.

Select any 5 books for only $4.95

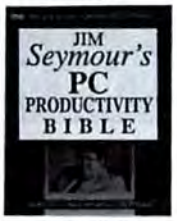
(Values to $156.75)

when you join
The Computer Book Club®

881670P-XX $29.95
Counts as 2

3769H $31.95
Hardcover

881889P-XX $29.95
Counts as 2



9409H $34.95
Hardcover

3922P $16.95

4175P $19.95

4069H-XX $39.95
Counts as 2/Hardcover

881821P-XXX $39.95
Counts as 3

3049P $29.95

881664P-XX $29.95
Counts as 2

4269H $29.95
Hardcover

3986P $29.95

881939P $19.95

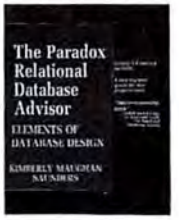
4149P-XX $29.95
Counts as 2

4186P $22.95

881901P-XX $29.95
Counts as 2

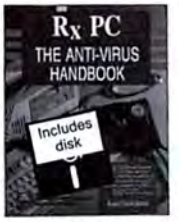
8818206P $29.95

881944P-XX $27.95
Counts as 2



4129P $21.95

8818265P $27.95



4262H-XX $39.95
Counts as 2/Hardcover

3279P $24.95

881855P-XX $39.95
Counts as 2

4103P $24.95

4104H-XX $39.95
Counts as 2/Hardcover

881869P-XX $27.95
Counts as 2

881937P $27.95

881768P $27.95

881731P $19.95

As a member of The Computer Book Club. . .

. . .you'll enjoy receiving Club bulletins every 3-4 weeks containing exciting offers on the latest books in the field at savings of up to 50% off of regular publishers' prices. If you want the Main Selection do nothing and it will be shipped automatically. If you want another book, or no book at all, simply return the reply form to us by the date specified. You'll have at least 10 days to decide. If you ever receive a book you don't want, due to late mail delivery of the Bulletin, you can return it at our expense. And you'll be eligible for *FREE* BOOKS through our Bonus Book Program. Your only obligation is to purchase 3 more books during the next 2 years, after which you may cancel your membership at any time.

PCW194

All books are softcover unless otherwise noted. Publishers' prices shown. If you select a book that counts as 2 choices, write the book number in one box and XX in the next. If you select a Counts as 3 choice, write the book number in one box and XXX in the next 2 boxes. A shipping/handling charge & sales tax will be added to all orders. ©1994 CBC

If card is missing, write to:
The Computer Book Club, Blue Ridge Summit, PA 17294-0820

Any Way You

Any PC System Configuration. Any Software Bundle. Built And Supp

AMERICA ONLINE 10 HRS. FREE WITH EVERY SYSTEM.

When you buy a system from us you can also plug into electronic magazines, newspapers, E-mail and message boards for up to 10 hours for free.

486SX/33 WITH 210MB HD, MONITOR

#818883

- Intel486SX/33
- 4MB RAM
- 1.44MB 3 1/2" Floppy Drive
- 1.2MB 5 1/4" Floppy Drive
- 1MB Super VGA Card
- 210MB Hard Drive
- 14" Super VGA .28 Non-Interlaced Monitor
- MS-Windows 3.1 / MSDOS 6.2 & Claris Works
- 101-Key Enhanced Keyboard & Mouse

PENTIUM OVERDRIVE PROCESSOR UPGRADEABLE

intel inside

We feature Intel inside every computer shown.

$1,299

$48/MO*

486DX2/50 WITH 210MB HD, LB VIDEO, MONITOR

#818894

- Intel486DX2/50
- 4MB RAM
- 1.44MB 3 1/2" Floppy Drive
- 1.2MB 5 1/4" Floppy Drive
- 1MB Local Bus Video Card
- 210MB Hard Drive
- Dual VL Slot Local Bus Motherboard
- 14" Super VGA .28 Non-Interlaced Monitor
- MS-Windows 3.1 / MSDOS 6.2 & Claris Works
- 101-Key Enhanced Keyboard & Mouse

PENTIUM OVERDRIVE PROCESSOR UPGRADEABLE

$1,799

$67/MO*

486DX2/66 WITH 210MB HD, LB VIDEO, MONITOR

#818872

- Intel486DX2/66
- 4MB RAM
- 1.44MB 3 1/2" Floppy Drive
- 1.2MB 5 1/4" Floppy Drive
- 1MB Local Bus Video Card
- 210MB Hard Drive
- Dual VL Slot Local Bus Motherboard
- 14" Super VGA .28 Non-Interlaced Monitor
- MS-Windows 3.1 / MSDOS 6.2 & Claris Works
- 101-Key Enhanced Keyboard & Mouse

PENTIUM OVERDRIVE PROCESSOR UPGRADEABLE

$1,899

$70/MO*

THE PENTIUM POWER TOWER

#818271

- Intel Pentium 60MHz CPU
- Compudyne Full Tower C
- 8MB RAM
- 1.44MB 3 1/2" Floppy Driv
- 1.2MB 5 1/4" Floppy Drive
- 540MB Hard Drive
- Diamond Viper 1MB Supe Local Bus Video Card
- 15" Super VGA .28 Non-Interlaced Monitor
- MS-Windows 3.1 / MSDC 6.2 & Claris Works
- 101-Key Enhanced Keybo & Mouse

MICROSOFT WINDOWS READY-TO-RUN

Every compu shown. Micro Wind Ready-to-Run

$4,499

$166/MO*

SERVICE

Open 7 days a week our in-store service dept. will service any brand of computer with over a half million dollars of on-hand parts.

CHOICE

With thousands of brand name computers in stock, you can have custom configured systems built to fit you by our Novell certified technicians.

1-800 AFFORDABILITY

We shop the competitors to offer you the lowest price. And because we're nationwide, you can buy direct and we'll ship out of the store nearest you.

CORPORATE EASE

Our corporate support inclu leasing, networking, corpora negotiated price list and a sp cial pickup window so your order is ready when you are.

Want It.

d From Your Nearest CompUSA Store.

ASES
ND
UNDLES

BASE SYSTEMS

*Base Systems do not include hard drives, video cards or monitors.

1 2 3

1

4865X/33
#818752
- Intel486SX/33
- 4 MB RAM
- 1.44 MB 3 1/2" Floppy Drive
- MS Windows 3.1/MSDOS 6.2 & Claris Works
- 101-Key Enhanced Keyboard & Mouse

649.99*

Base System 1 Plus
- 210 MB HD
- VGA Card
- 14" Super VGA .39 Monitor

#818781
$1,099
$41/MO*

Base System 1 Plus
- 210 MB HD
- 512K Super VGA Card
- Fax Modem
- 14" Super VGA .39 Monitor

#818792
$1,199
$44/MO*

Base System 1 Plus
- 210 MB HD
- 512K Super VGA Card
- 1.2 MB 5 1/4" Floppy Drive
- Fax Modem
- 14" Super VGA .28 NI Monitor

#818805
$1,399
$52/MO*

2

486DX2/50
#818761
- Intel486DX2/50
- 4MB RAM
- 1.44 MB 3 1/2" Floppy Drive
- MS Windows 3.1/MSDOS 6.2 & Claris Works
- 101-Key Enhanced Keyboard & Mouse
- Dual VL Slot Local Bus Motherboard

949.99*

Base System 2 Plus
- 210 MB HD
- Super VGA Card
- 14" Super VGA .39 Monitor

#818814
$1,499
$55/MO*

Base System 2 Plus
- 340 MB HD
- 1 MB Local Bus Video Card
- Fax Modem
- 14" Super VGA .28 NI Monitor

#818823
$1,699
$63/MO*

Base System 2 Plus
- 340 MB HD
- 1 MB Local Bus Video Card
- 1.2 MB 5 1/4" Floppy Drive
- Fax Modem
- 15" Super VGA .28 NI Monitor

#818832
$1,999
$74/MO*

3

486DX2/66
#818770
- Intel486DX2/66
- 4 MB RAM
- 1.44 MB 3 1/2" Floppy Drive
- MS Windows 3.1/MSDOS 6 .2 & Claris Works
- 101-Key Enhanced Keyboard & Mouse
- Dual VL Slot Local Bus Motherboard

1,099.99*
$41/MO*

Base System 3 Plus
- 210 MB HD
- 1 MB Local Bus Video Card
- Fax Modem
- 14" Super VGA .39 Monitor

#818841
$1,799
$67/MO*

Base System 3 Plus
- 340 MB HD
- 1 MB Local Bus Video Card
- 1.2 MB 5 1/4" Floppy Drive
- Fax Modem
- 14" Super VGA .28 NI Monitor

#818850
$1,999
$74/MO*

Base System 3 Plus
- 540 MB HD
- 1 MB Diamond Viper Super Local Bus Video Card
- 250MB Tape Backup
- 1.2 MB 5 1/4" Floppy Drive
- 14.4 Fax/Modem
- 15" Super VGA .28 NI Monitor

#818861
$2,799
$104/MO*

VORITE OPTIONS NOW AVAILABLE

nner Diskstor 250 Tape Backup

mpudyne 1.2 MB 5.25" Floppy Drive

mpudyne 14.4/14.4 Kbps Send/Receive FAX/Modem

eative Labs Omni CD kit, Dual Speed CD w/Controller

ILTIMEDIA UPGRADE KITS

npudyne Multimedia Upgrade kits include quality audio cards, rnal CD-ROM drives and a special selection of multimedia soft- e so you can enter the world of multimedia computing immediately.

PPORT

-free and 900# service lines, -commissioned sales experts computer training in-store n-site.

MAINTENANCE

We offer upgrades, on-sight service, next-day response, extended warranties and tailored maintenance agreements to suit your needs.

intel inside

COMPUDYNE

800-COMPUSA

COMPUSA

THE COMPUTER SUPERSTORE

OPEN 24 HOURS A DAY, 7 DAYS A WEEK.

24 HR FAX: 800-FAX-2212
INTERNATIONAL PHONE: 214-888-5770
INTERNATIONAL ORDERS WELCOME
ON OUR 24 HR FAX LINE: 214-888-5706

PCW0141

GOVERNMENT/EDUCATIONAL SALES CALL:
800-862-3088
FAX: 214-888-5783 · COMPUSA GSA#: GS00K93AGS-6319

Leasing arranged through Leasing Group, Inc., payments based on 36-month open-end rate. Must be returned "as new" in original packaging. Within the continental United States. Each system will be shipped from the nearest CompUSA Superstore. CompUSA is not responsible for typographic / technical errors. Other limitations apply. Training courses not offered as vocational training or as qualifying one for any particular employment. Course credits not transferable to any accredited educational institution. In Texas, Nevada and Connecticut, classes are offered as employer sponsored courses, not open to general public. Prices and specifications subject to change without notice. Intel 486 and the Intel Inside logo are trademarks of the Intel Corp. Trademarks belong to their registered owners. CompUSA Direct, 15167 Business Avenue, Dallas, TX 75244.

Circle 14 on reader service card

DATA MANAGEMENT Q & A

Getting dBASE Ready for Work

Q Every time I load dBASE III Plus, I go through the same steps to set up my work areas—I change a few settings, open my data files with their indexes, and so on. This is really getting tiresome. Is there some way to automate these tasks so that dBASE performs them every time I start it?
Don Leonardi, Los Angeles

A You can create a simple program that does everything you normally do when you start dBASE, and then customize dBASE so that it runs this program every time it's loaded. And no, you don't have to be a programmer to do it. The following instructions work for dBASE III Plus and dBASE IV.

To create the program, simply enter the commands you usually run when you load dBASE in an ASCII text file called STARTUP.PRG; to use the editor that comes with dBASE, use the command **MODIFY COMM STARTUP**. If you use the Assistant instead of typing in the commands yourself, get everything in place as you usually do, then press **<Esc>** to go to the dot prompt and enter **LIST HISTORY TO PRINT**. This will print a copy of the commands you need in your STARTUP file, which you can read as you type them in. Check **FIGURE 1** for a sample startup program that will give you the general idea.

After you've created STARTUP.PRG, you must change another ASCII text file, CONFIG.DB, to tell dBASE to execute this program every time it loads. By default, CONFIG.DB—which should already be in your DBASE directory—has just two lines: STATUS=ON and COMMAND=ASSIST. Change the COMMAND line to **COMMAND=DO STARTUP** and save the file. The next time you start dBASE, the program will run your commands automatically.

By the way, if the only commands that you run after loading dBASE are SET commands, you don't need to bother with creating a PRG file. Adding the line CARRY=ON to CONFIG.DB will have the same effect as putting SET CARRY ON in your STARTUP.PRG file.

```
SET CARRY ON
USE C:PROJECTS INDEX PROJNUM
SELECT 2
USE C:STAFF INDEX LASTNAME
SELECT 1
APPEND
```

FIGURE 1: SET UP DBASE every time you load it with a startup program such as this one.

Restarting a dBASE Report From the Dot Prompt

Remember Blaine Fuhrman's problem with restarting a dBASE III Plus report after a printer jam ("Getting Out of a Jam With dBASE Labels," August 1993)? George W. McLellan of Chapel Hill, North Carolina, sent in a better solution than mine, and his doesn't require any programming.

Once you've fixed your printer, use the FIND command to get to the last record printed. For instance, if the data file is indexed by last name, and the last record printed is for John Jasper, enter **FIND "Jasper"**. Then enter **SKIP** to get to the next record—the first one that wasn't printed—and enter **LABEL FORM** *formname* **TO PRINT NEXT** *n*, where *formname* is the name of your form and *n* is a number greater than the number of records left to be printed. You don't have to know exactly how many records are left to print—anything bigger than the highest possible number will do. That's all! Your report will start again where it left off.

Varying Font Sizes in Paradox

Q I'm using Paradox 4.0 to track registration information for conventions and print badges for attendees. Is there a way to make Paradox change the point sizes for each of the fields so that one can be 32 points and the others 18? Also, my company is in the process of changing to a Windows environment, and I'd like to know whether my Paradox 4.0 applications will work with Paradox for Windows.
Alan Biren, Plainview, New York

A Yes, there's a way to print some fields in different—and larger—fonts than others in Paradox 4.0. It involves using your printer's control codes, something that nearly all non-PostScript printers have. You didn't tell me what printer you're using, so I can't give you the exact codes, but the basic approach remains the same.

First check your printer manual to see what control codes are needed for printing the fonts you want and have available. Usually this information is included in an appendix called Printer Control Codes, Command Sequences, or something like that. Then go into the report you use to print your labels, and make room for a calculated field on either side of the regular field you want to change. Make sure to leave enough space for the entire length of the control code string. Don't worry that your field is getting pushed to the right in the report layout—when the report is printed, the control codes will be "eaten" by the printer and won't take up any space on the page.

Next, move the cursor to the first space you made—the one before the field you want in a larger font—and select *Field•Place•Calculated*. In the resulting calculation box, enter—within quotation marks—the control code for printing your large font. Where your manual has you enter an Escape character as part of a control code, substitute **\027**. Then place another calculated field, this one with the code for returning to your normal font, after that field or fields.

Some control codes get pretty long and complicated, and many are made up of several pieces: one for type style, another for size, another for boldface, and so on. For example, on my LaserJet-compatible OkiLaser 400, printing

bold Swiss type with a 14.4 point size requires the code "\027(s1p14.4v0s3b4T". To go back to my default 10-point Helvetica, I must use "\027(s0p10h12v0s0b3T". If your printer doesn't support scalable fonts, be sure to choose a point size that your type style comes in.

Regarding your last question, you can use Paradox 4.0 data files in Paradox for Windows, but that's about as far as it goes. You can't use the same forms, reports, or applications, as the Windows version handles these tools in an entirely different way.

Recording Incomplete Dates in Paradox for Windows

Q Working for a law firm, I often enter data from documents that have incomplete or missing dates. Sometimes only the month or year is available for a particular document, and other times not even that. The problem is that Paradox for Windows won't let me enter a date such as 05-00-84 or 00-00-91, to say nothing of 00-00-00, which I use to show that a date is missing, not just forgotten during data entry. Is there any way to get Paradox for Windows to accept these incomplete dates? I've thought of making my data fields alphanumeric, but if I do that, they would lose the data-entry controls inherent in a date field.

James Barrett, Minneapolis

A I'm afraid Paradox for Windows won't permit you to enter the dates you describe in a date field. But if you do change your date fields to alphanumeric, you can use picture validation to restrict data entry in a way that is similar to how date fields do it. You still won't be able to do date arithmetic, but as Paradox would not know how to perform calculations with your incomplete dates, you probably aren't doing it anyway.

To change your date field and add a "picture," select *Table•Restructure* if your table is open on the desktop, or *File•Utilities•Restructure* and the name of your file if it isn't. Change your date field's type to **A**lphanumeric and its size to **10**. With the field still selected, choose *Validity Checks* from the Table Properties drop-down menu on the right side of the dialog box. Click on the *Picture* box and enter **##/##/####**. This will force the user to enter two digits each for the month and day and four digits for the year; a four-digit year is preferable as we approach the end of the century. Paradox will automatically fill in the slashes as the numbers are entered. To close the dialog and save the table with its new structure, click *Save*.

The picture noted above doesn't check for valid months and days, and it will allow you to enter dates like 13/79/1994. If you want more control, enter **{0[0,1,2,3,4,5,6,7,8,9},1{0,1,2}}/[{0,1,2}{0,1,2,3,4,5,6,7,8,9},3{0,1}]/####** in the Picture box. This picture will still let you enter 4/31/1994 or 2/29/1995, but it will stop the more extreme errors.

By Celeste Robinson

Celeste Robinson is a contributing editor for PC World *and the author of the* Paradox 4.0 Handbook *(Bantam Computer Books, New York, 1992).* Data Management *welcomes your questions. See page 12 for contact information.* ■

REPRINTS IN AN INSTANT

1 CALL HOTLINE

1-800-234-0455

ext. 965 - FREE Catalog of Reprints
ext. 265 - To Order Reprints $4.95/each
(fees charged to Visa or Mastercard)

OR,
Order Reprints By Calling:

1-900-773-2972
($4.95 charged to telephone bill)

2 REQUEST INFORMATION

1. Enter the document number that corresponds to the article(s) you want to receive.
2. Enter your fax number.

PC WORLD

Touchtone phone required. Please have 3-digit category number, credit card number (800 toll-free calls only) and fax number ready when you call. Under 18 requires parental consent. Please call 415-243-0500 with questions or comments.

3 RECEIVE INSTANTLY ...by FAX

Use PC World's FAX-ON-DEMAND system to receive information instantly and easily - 24 hours a day!

PUBLISHING & PRESENTATIONS MAKEOVER

Keep It Simple

Thoreau may not have been a desktop publisher, but when he cautioned us to "simplify, simplify," he was talking like one. Simplifying the design of published materials is the key to maximizing their impact.

This month's make-over candidate comes from the Insurors of Tennessee, a trade association for insurance agents. Bill Wilson, director of the association's education and membership services, advertises seminars by inserting fliers into the group's semimonthly newsletter. He creates the fliers using PageMaker and a 33-MHz Zeos 386.

The flier's original design is too busy. The page consists of six boxes of text, plus titles, a logo, and a routing box at the top. These elements compete with each other visually, making it hard for readers to know where to start.

The solution: Eliminate superfluous elements, then assemble the remaining components in a more readable order.

Break It Down

The most important information on the flier is the title of the seminar, "Business Income Coverages." But in the original design, the title is surrounded by less important elements. To reduce this clutter, we enlarged the title and set it against a white background. Then we combined the lines "Insurors of Tennessee" and "Advanced Seminar Series" into a single line, moved the TSI logo to the bottom of the page, and eliminated the "Route to:" box.

Next we turned our attention to the rest of the page. In the old layout, the text in the six boxes covers three topics: why the course is being offered, what it will cover, and who should attend. We removed the boxes and rearranged the copy into three sections of straight text.

The old layout relegates the *why* of the seminar to a box on the right side of the page headed "Producers." We extracted this text from the box and moved it to a column on the left, which helps introduce the rest of the page.

Next we consolidated the information from two boxes that tell readers *what* the seminar will cover ("Top Five Reasons To Attend This Seminar" and "Additional Course Content Details"), moved it to a middle column, headlined it "What We'll Cover," and added bullets to identify it as a list.

We took the information about *who* should attend the class from the boxes "Intended Audience" and "Experience Level," moved it to the middle column, and added the subhead "Who Should Attend." Finally, we recast the box titled "CE Credit Hours" as a small table at the bottom of the page.

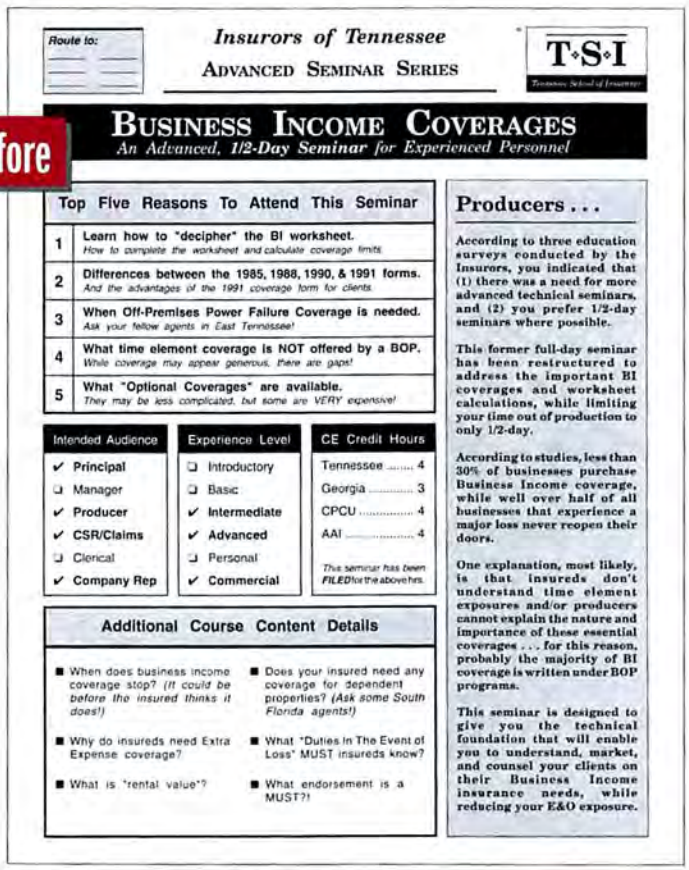
Little Boxes

Having answered the who, what, and why of the seminar, we felt obliged to cover *when* and *where*. A calendar is a logical means to do so. But since a calendar is fundamentally different from plain text, we wanted to differentiate it visually from the previous two columns. The solution: We put a box around it and filled it with a light screen.

As part of our effort to reduce the number of visual elements, we reduced the number of typefaces. The original is a hodgepodge of Helvetica and Times Roman in italic and bold. We replaced these with Century School Book and stuck to a more consistent use of uppercase and lowercase lettering.

By David Brickley and Dan Miller

The redesign was performed by David Brickley, a designer based in Moss Beach, California. Dan Miller is an assistant editor for PC World. Publishing & Presentations *welcomes your business document and presentation make-over candidates and your publishing and presentations questions. See page 12 for contact information.*



After

Insurors of Tennessee Advanced Seminar Series

BUSINESS INCOME COVERAGES

An Advanced Half-Day Seminar for Experienced Personnel

1 **Titles should be easy to identify—readers should be able to tell at a glance what the writer is trying to convey.**

According to surveys conducted by the Insurors of Tennessee last year, (1) you want more advanced technical seminars, and (2) you prefer half-day seminars when possible. Well, we're listening.

This former full-day seminar has been restructured to give you the information you need while limiting your time away from the office to just half a day.

2 **Each page should have a beginning, a middle, and an end. Your design should tell readers where to start.**

…o recent studies, … percent of busi… …se Business Income … well over half of … that experience a … …er again reopen their doors.

One likely explanation is that insureds don't understand time element exposures and/or producers cannot explain the nature and importance of these essential coverages. For these reasons, probably the majority of BI coverages are written under BOP programs.

This seminar is designed to give you the technical foundation you need to understand, market, and counsel your clients on their Business Income insurance needs, while at the same time reducing your E&O exposure.

What We'll Cover

- Learn how to to complete the Business Income worksheet, and to calculate coverage limits.
- What are the differences between the 1985, 1988, 1990, 1991 forms, and what are the advantages of the 1991 form for clients?
- When is off-premises power failure coverage needed?
- What time element coverage is not offered by a BOP?
- What "optional coverages" are available?
- When does Business Income coverage stop?
- What is "rental value?"
- Does your insured need any coverage for dependent agents?
- What "Duties in the Event of Loss" must insureds know?
- Which endorsement is a must?

Who Should Attend

This seminar is intended for Principal, Producer, CSR/Claims, and Company Representatives with Intermediate to Advanced Commercial experience.

CE Credit Hours:

Tennessee ---------	4
Georgia ----------	3
CPCU ----------	4
AAI ----------	4

This seminar has been FILED for the above hours.

3 **If you're thinking about using a table, be sure the information is suited to it. Lists and numbers make better tables than straight text does.**

Calendar of Upcoming Advanced Seminars

Adva… Auto and Garage
11…
11…
11…
11…
11…

4 **Watch your typefaces: Too many different fonts on a page make it look unprofessional.**

Business Income Coverages
1/15 - Memphis
1/16 - Dyersburg
1/17 - Nashville
1/18 - Chattanooga
1/19 - Knoxville

Commercial Lines Update
2/1 - Tri-Cities
2/2 - Knoxville
2/3 - Chattanooga
3/22 - Jackson
3/23 - Memphis

CISR - ALS (for CISR's only)
3/3 - Tri-Cities
3/4 - Knoxville
3/17 - Memphis
3/18 - Jackson
3/24 - Chattanooga
3/25 - Nashville

CIRS - Agency Operations
4/6 - Knoxville
4/27 - Chattanooga
5/25 - Nashville
6/14 - Memphis

T-S-I
Tennessee School of Insurance

MultiSpin is a registered trademark and FastFacts is a trademark of NEC Technologies, Inc. NEC #GS00K91AG55241 © 1993 NEC Technologies, Inc.

You want the truth? Here it is. NEC's new MultiSpin® 3X CD-ROM readers are the best-performing readers on the market.

We were the first to introduce double speed. And now we improved our data transfer rate to 450 Kbytes/sec. and made a triple-speed reader. (Because that's what you wanted.) We also cut our access time to less than 200 milliseconds, added a 256-Kbyte continuous-flow cache, SCSI 2 interface and a full 16-bit SCSI card.

Which means you can get your information three times faster than you can with standard readers, see smoother animation and video.

NEC MultiSpin 3Xp and 3Xe

Our new MultiSpin CD-ROM readers are not only fast but interactive, with stand-alone audio controls and an LCD display on the front panel. So you don't have to rely on your computer to tell you what's going on (or not going on) with your reader.

They're compatible with Macs and PCs, as well as Kodak Multisession Photo CDs. And, they come with the longest commitment in the industry – a 2-year limited warranty.

For more information, call 1-800-NEC-INFO. Or for details via fax, call NEC FastFacts™ at 1-800-366-0476, request document #23768. We'll answer all your questions about CD-ROM. And you'll actually get to have an honest conversation for a change.

NEC

Circle 187 on reader service card

COMMUNICATIONS Q&A

Faxes That Know Voice From Data

Q I have a fax-modem on the same line as my telephone. Is there a way to make the fax-modem distinguish between a fax and a voice call? Are there any products that can do this when my modem is off?
Charles Forelle, New York

A Determining the nature of an incoming call is something only sophisticated fax-modems can do. For instance, there are three internal fax-modems in Intel's SatisFaxtion line that can make the distinction: the $269, 2400-bps 200; the $329, 9600-bps 350; and the $399, 14,400-bps 400. However, these fax-modems support only the DCA/Intel Communicating Applications Specification (CAS), a method for communicating with fax software, instead of the industry-standard Service Class 1 or 2. So you'll have to make sure your fax software supports CAS. For more information call Intel at 800/548-4725.

By the time you read this, a number of fax-modems with on-board digital signal processors will have hit the market. They'll be able to distinguish between voice, fax, and data and route calls appropriately or take voice messages.

Watch out for other types of gadgets that claim they can determine the nature of incoming calls. Neither communications software nor black-box–type devices that hook up between the fax and the phone jack can reliably tell the difference between bits and breath.

What Good Is 14,400 bps?

Q I recently bought a 14,400-bps fax-modem to save money on long-distance calls. I was disappointed to see that it usually transmits faxes at 9600 bps or 4800 bps, thanks to the paucity of other 14,400-bps fax devices out there. Did I waste my money?
Albert Zhou, Indianapolis

A Not at all. These days, the price difference between a 9600-bps and a 14,400-bps modem can be as little as $30. And even if you connect at 14,400 bps to just a handful of fax devices, the long-distance savings can pay for the extra speed in just a few months. Say you pay $1.50 in tolls and taxes each time you transmit a three-page fax at 9600 bps. With a 14,400-bps modem, you'll cut your costs by a third with each transmission, which means your modem may well pay for itself after about 60 faxes. What's more, fax-modem technology has been springing ahead so fast that slower models will seem like dinosaurs in another year.

Navigating CompuServe MHS Hubs

Q Our firm recently purchased the Notework 2.0 E-mail system with a Message Handling Service (MHS) hub. I would like to send E-mail to an Internet address using the CompuServe MHS Hub. How should I address it?
Ro Kolakowski, Los Angeles

A CompuServe's Mail Hub allows users of connected company LANs to send E-mail to other company LANs, to CompuServe users, and to the many message services connected to it, including Internet, AT&T Mail, MCI Mail, and SprintMail.

To route a message to an Internet address via the CompuServe MHS Hub, for example, you would enter **MAIL@CSERVE {INTERNET:***username@subdomain.domain***}**, where *username@subdomain.domain* is the recipient's Internet address, as in 'larryg@att.com'. Internet users sending messages via the CompuServe MHS Hub to a company LAN would use *username@workgroup*.**MHS.COMPUSERVE.COM**. For more information about using the MHS Hub, type **GO MHS** at any CompuServe prompt.

Update on Password Faux Pas

In October's *Communications* column, we reported that SWFTE International's The Wire transmits users' private MCI Mail passwords to the company along with registration information. SWFTE has corrected this problem, and the current version does not transmit passwords.

SWFTE is offering free upgrades to version 2.24A to all users of The Wire. To receive your upgrade, send the company an MCI message via The Wire by selecting *Help/Swfte Tech Support*.

In our original report, we quoted a SWFTE spokesperson who said that access to users' passwords was granted as part of their contract with MCI Mail. As it turns out, the spokesperson was mistaken. MCI does not allow any outside parties to have access to MCI Mail passwords.

By Judy Heim

Judy Heim is a contributing editor for PC World *and the editor of* Online Investor, *a newsletter about using online services to track and manage investments.* Communications *welcomes your questions. See page 12 for contact information.*

USER GROUP TIP

Forcing a Busy Signal

I use a single phone line for voice and data calls, and there's nothing worse than having someone call just as my modem starts dialing, especially if the hapless caller gets a screeching sound as the remote communications software tries to connect.

Luckily, I've found a way to avoid such incidents: With a Hayes-compatible modem, I just start up my remote communications program, enter the interactive mode, and type ATH1 followed by <Enter>. The modem responds with 'OK', and the line then is "off hook," stopping incoming calls and giving callers a busy signal. When I'm ready to start remote communications, I first type ATH0 and <Enter> to hang up. Of course, if you keep the line off hook too long, you'll get a recorded message and an annoying noise as you would with a regular phone. If you want to tie up your line but you don't want to listen to the noise, type ATH1M0 and <Enter> to silence the modem.

John Rusnak
Amateur Computer Group of New Jersey

THE DECISION FOR THE RIGHT SIDE OF YOUR BRAIN.

WordPerfect 6.0 for Windows The latest version.

THE DECISION FOR THE LEFT SIDE OF YOUR BRAIN.

Lotus 1-2-3 for Windows R.4.0 The latest release.

THE DECISION THAT'S A NO-BRAINER.

The latest from Compaq DirectPlus: The ProLinea 4/33s Total Solution Paq.
*$1,699 or $61 per month**

The Total Solution Paq includes the new Compaq ProLinea 4/33s with 4MB RAM, 120MB Hard Drive, a Compaq 1024 Color Monitor (1024 x 768 non-interlaced), a 2,400-bps Data+Fax Modem with WinFax Lite software, preinstalled MS-DOS 6, Microsoft Windows 3.1, WordPerfect 6.0 for Windows, Lotus 1-2-3 for Windows R.4.0, ReachOut Remote Control communications software, TabWorks and CompuServe.

Whether you work logically or intuitively, Compaq DirectPlus℠ has the perfect answer to your computing needs.

A complete ready-to-use package, the Compaq ProLinea™ 4/33s Total Solution Paq℠ combines the latest versions of WordPerfect and Lotus 1-2-3 with the latest version of our acclaimed ProLinea PC, the 4/33s. This high performance desktop is 30 percent faster than 486SX/25 machines, to handle word processing, spreadsheet and database applications with ease.

ProLinea 4/33s Features

- *33 MHz 486SX*
- *4MB RAM*
- *120MB Hard Drive*
- *3½" 1.44MB Diskette Drive*
- *Compaq Color Monitor*
- *Local Bus Video with 1MB Memory*
- *Preinstalled MS-DOS® 6 & Microsoft® Windows™ 3.1*
- *Compaq Mouse*
- *3-Year Warranty*

The Compaq Total Solution Paq also includes a 2,400-bps Data+Fax Modem that lets you send and receive directly, as well as access CompuServe.†† The Compaq ProLinea 4/33s is backed by our free 3-year warranty.† And a free technical assistance hotline is available every hour of every day.

So don't wait. Get everything you need with one decision: call Compaq DirectPlus. And conserve your brainpower for the sort of thing that really requires it. Like running your business.

COMPAQ DirectPlus
1-800-888-5830
Weekdays 7-7, Sat 10-4 CST.
Ask for our new free catalog.

*Leasing is provided by GE Capital Services for a term of 36 months and is subject to approved credit and certain terms and conditions. Call for details. †Restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. ††CompuServe preinstalled with 30-day free trial membership. ©1993 Compaq Computer Corporation. All rights reserved. Compaq and the Compaq Logo Registered U.S. Patent and Trademark Office. ProLinea is a trademark and Compaq DirectPlus and Solution Paq are service marks of Compaq Computer Corporation. Products, prices and programs are subject to change without notice. Other products are trademarks or registered trademarks of their respective companies. Microsoft and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation. The Intel Logo is a registered trademark of Intel Corporation. Offer available in the U.S. only.

Circle 47 on reader service card

HARDWARE Q&A

A Mouse of a Different Color

Q I'm running out of slots and would like to get rid of my Microsoft bus mouse card. Can I convert my bus mouse into a serial mouse? Is there any disadvantage to a serial mouse?
Gloria Rodriguez, San Jose, California

A According to Microsoft, you're out of luck. The company doesn't sell a bus-to-serial mouse converter and knows of no third party that does, so you'll have to buy a new mouse if you want to go serial. To answer your second question, there's no difference in performance between a bus mouse and a serial mouse—you won't even have to change your software installation. The only drawback is that you lose a serial port instead of a slot.

Seven Steps to Drive C: Recovery

Q I'm faxing you this because I'm desperate. When I turned on my PC this morning, it wouldn't boot. So I booted from a floppy, and when I tried to switch to drive C:, I got the message 'Invalid drive specification'. I haven't added any cards or changed anything, and I don't have a recent backup. Is this the end of my hard disk?
Natalie Balfour, Fargo, North Dakota

A Not likely. Everyone encounters a disappearing hard drive at some time, and unless you've had problems with the drive before and ignored them, you have every chance of getting your drive and data back intact. Take a deep breath, try the following steps, and remember the cardinal rule: As soon as you get access to the drive, back up all data immediately. I've listed the easiest fixes for the most likely problems first.

1) Unless you have a SCSI drive or an auto-configuring drive, such as a Hardcard, that bypasses your BIOS, try this. Bring up your system's setup routine. Some BIOS's will display a message that tells you how. If yours doesn't, try <Ctrl>-<Alt>-<Insert>, <Ctrl>-<Alt>-S, <Ctrl>-<Alt>-<Esc>, or simply <Esc> or <Delete> after your system does its memory check. (If none of these works, consult your manual or the manufacturer's tech support.)

On the main setup menu, look for 'Fixed disk 1' or a similar entry. If you see the word 'None' or something equally negative, then you've lost your drive configuration. How? A little battery in the system, which powers a tiny amount of RAM that holds the configuration data, is dying. Change 'None' to the correct drive type, save the configuration, and reboot. (If you don't know the drive type, call tech support. If you lack documentation on the drive, you may need to open up your PC and copy down the drive's model number so a techie can help you. For a full description of how to reenter setup data and change batteries, see "Password: Help!" in last month's column.) Everything should work, but don't turn off your machine until you're ready to change the battery, or you may have to do this every time you fire up your system.

When I turned on my PC today, I got the message, 'Invalid drive specification'. Is this the end of my hard disk?

2) If you have a SCSI drive, I have a question: Installed any new software lately? Some SCSI devices require a line in your CONFIG.SYS file, and software installation routines are notorious for scrambling CONFIG.SYS.

If you don't know whether your drive needs a CONFIG.SYS DEVICE statement or what that statement should be if you need one, check the manual or call the manufacturer. Write that statement down when you get it, then boot from a floppy and swap in a disk containing DOS's text editor. Use the editor to create a new CONFIG.SYS file containing the device statement, save the file, and reboot from the floppy. If this works, open the CONFIG.SYS in drive C:'s root directory, and look for the statement. If it's not there, or if it's jammed on a line with something else, enter the correct DEVICE statement on its own line immediately after any memory managers you may have (such as HIMEM.SYS). Reboot, and remember: Always check CONFIG.SYS after you install software.

3) Leave your system on for an hour. Then reboot and see if it works. If your machine was cold overnight, components inside the drive may have contracted enough so that the read/write heads can't find the boot sector on your drive. As the drive warms up, the components realign themselves into the position they were in when they wrote the data, and everything works.

Unless the climate change was radical, temperature sensitivity often signals that your drive is drifting out of alignment. Back up your data. Then run a nondestructive, low-level format program such as The Norton Utilities' Calibrate or Gibson Research's SpinRite, which can restore data on the drive, including sector information, to its rightful place. If you run a low-level format and still have problems, get a new drive.

4) Try running a hard disk diagnostic program, such as The Norton Utilities' Disk Doctor, from drive A:. Norton and many other utilities can detect a drive when DOS cannot. If the utility detects your hard drive, it may give you an error message and recommended action. If no error messages appear, or you get one stating that drive C: isn't bootable, use a utility to make it bootable. Reboot, and if the drive comes to life, back it up immediately and run a nondestructive, low-level format.

5) Turn off your PC, open it up, and reseat all of the cables—that is, unplug them and plug them in again. Reseating ensures nothing has come loose and scrapes away corrosion that may have accumulated on the contacts. If the data cable (a flat, gray ribbon cable) plugs into the motherboard, remember to

reseat that connector, too. If your drive plugs into a card, reseat the card as well, all the way into the slot. Finally, reseat the power cable, a three-conductor cable running from the power supply to the drive, where it ends in a white plug. The plug should be hard to remove, so make sure you pull on the plug and not the cable, and push hard to plug it all the way back into the drive. Turn on your machine and see if it works. If it doesn't, turn off your PC and leave the cover off for the next step.

6) Turn your PC on again. Put your ear to the drive. Does it make any noise? Usually, you can hear a rising whir or whine as the drive spins up. If you hear nothing, and you have an old drive, you could be a victim of *stiction* (short for static friction), where the heads actually stick to the platter.

There are two ways to cure stiction. First, turn off your PC, disconnect the cables, and remove the drive. Hold the drive firmly in your hand, with the broad, flat, smooth side of the drive resting against your palm. To unstick the heads, twist the entire drive hard and fast in your hand a couple of times along the plane of the drive's platter. Plug the drive back in, and turn your system on. If the drive still won't spin, turn off the system, disconnect the cables again, and try twisting the drive's spindle—if you can get hold of it. Often you'll find it under the drive's circuit board, which is usually safe to remove, as long as you're careful not to put a strain on the short ribbon cable between the circuit board and the drive. The spindle may be slotted for a screwdriver, but most likely you'll have to grab it and twist with a pair of pliers. If you reconnect the drive and it works, back up your data immediately, and buy a replacement drive pronto.

7) Even if you run a diagnostic and can't detect any controller errors, try another interface card—but make sure you try the right one. You should be able to connect any IDE hard disk to any IDE interface board; the same goes for SCSI drives and cards. With ESDI, ST506, and XT-type drives, however, you may need to do some fancy configuring to get card and drive to talk to each other. Contact the drive and card manufacturers for help.

If none of these strategies works and the data on that dead drive is vital, it's time to bring in the professionals. Some argue that you should do this before attempting a low-level format, since low-level formatting with a damaged or misaligned head could trash everything. That's certainly possible, which is why I emphasize that *you must back up as soon as you get the drive running.* If the drive then goes belly up, you can always buy another drive and restore the data to it, which is cheaper than sending the drive to a data recovery service. But when all else fails, those services really can help, especially if they have access to a clean room, where they can open up and physically repair the drive safely, at least to the point at which data can be recovered. Three such services are Group One Electronics (818/993-4575), Ontrack Data Recovery (800/752-1333), and Workman and Associates (818/791-7979).

By Eric Knorr

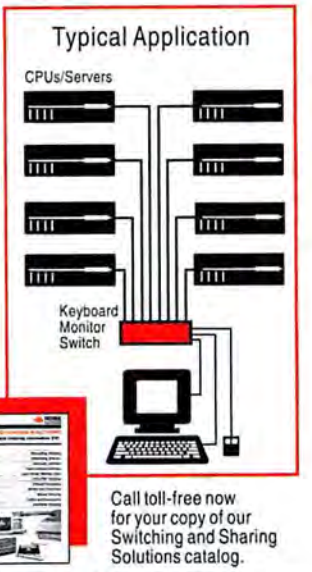
Eric Knorr is a contributing editor for PC World. Hardware *welcomes your questions.* *See page 12 for contact information.*

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



- 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

Call toll-free now for your copy of our Switching and Sharing Solutions catalog.

Other Rose products: Print servers, printer sharing units, print buffers, keyboard monitor extenders, video splitters. All Rose products are US-made and have a 1-year warranty.

Make the Rose Connection

ROSE ELECTRONICS

10850 Wilcrest Drive • Houston, Texas 77099 • Phone (713)933-7673 • Fax (713) 933-0044

1-800-333-9343

Circle 239 on reader service card

PCW INFO HOTLINE: INSTANT FAX BACK
1-800-234-0455 ext. 145

STAR-DOT-STAR TIPS

Finessing Floppies

If you've accumulated as large a collection of floppies as I have, you'll probably appreciate an easy way to keep track of your ever-growing collection. CATALOG.BAT **[FIGURE 1]** prints directory listings of your floppies that you can keep with the disks. It will even record hidden files.

The batch file uses DOS 6.*x*'s new CHOICE command to ask you which drive you want to catalog (A: or B:). It then gets the volume label and directory from the floppy disk using the command DIR A:\ /S /A /O:N, alphabetizing the files as it does so. Finally, it sends the whole listing to the printer. You can file the catalog page for later reference, either by numbering both the page and the disk or by keeping the page with the disk.

Justin Jordan, Memphis

Editor's note: This is a fast, no-nonsense way of keeping track of what's on your floppies. Best of all, it lets you take a two-fisted approach—you put one floppy in the drive while you're printing the contents of another, clearing away a pile of unmarked disks in no time. I changed Jordan's batch file slightly so in addition to printing, it saves all your floppy listings to a single ASCII file for quick searches.

Create CATALOG.BAT as an ASCII text file, and save it to a directory in your AUTOEXEC.BAT's PATH statement. There's one trick you need to know when entering the file: You can't type the ♀ character, which is ASCII code 12. How you place it in your document depends on what text editor or word processor you use. If you use DOS's EDIT program, type **<Ctrl>-P**, then hold down **<Alt>** as you type **12** on the numeric keyboard. CATALOG.BAT is available on PC World Online.

By the way, this batch file is a good example of DOS 6.*x*'s CHOICE command, which lets you pick one of several options to redirect your batch file. If you haven't upgraded to DOS 6.*x* yet (I haven't), and you have Norton Utilities on hand, you can substitute the Norton Batch Enhancer command **BE ASK "Drive to catalog (Q to Quit)?" ABQ** for the CHOICE command in the listing. If you have more than two floppy drives, it's easy to add additional drive letters; just be sure to adjust the IF ERRORLEVEL statements to reflect the new choices.

```
@ECHO OFF
CLS
ECHO.

:REPEAT
REM Ask for action
CHOICE /C:ABQ /N Drive to catalog (Q to Quit)?
ECHO.
IF ERRORLEVEL 3 GOTO END
IF ERRORLEVEL 2 GOTO DRIVEB
IF ERRORLEVEL 1 GOTO DRIVEA

:DRIVEA
SET CATDRIVE=A
GOTO CATALOG

:DRIVEB
SET CATDRIVE=B
GOTO CATALOG

:CATALOG
REM Catalog drive %CATDRIVE%
CLS
ECHO Now cataloging drive %CATDRIVE%...
ECHO Catalog for drive %CATDRIVE%: > TEMP.TXT
ECHO. >> TEMP.TXT
DIR %CATDRIVE%:\ /S /A /O:N >> TEMP.TXT
TYPE TEMP.TXT > PRN
ECHO ♀ > PRN
TYPE TEMP.TXT >> FLOPPIES.TXT
ECHO Cataloging of drive %CATDRIVE% complete!
GOTO REPEAT

:END
```

FIGURE 1: CATALOG YOUR FLOPPIES with this handy batch file.

Many Marquees

If you read "75 Tips for Windows and DOS," you may remember Rodney Bayron's tip about setting up a screen saver so you can launch it from Program Manager ["Instant Screen Saver," July 1993]. I've discovered a variation on his trick that allows you to set up multiple Marquee screen savers, each with a different message.

The original tip was based on the fact that a screen saver, even though it has the extension SCR, is actually a complete program. If you put the extension **SCR** at the end of your WIN.INI file's Programs= line, you can launch any Windows screen saver directly.

For the easiest launching, change your WIN.INI, then drag an SCR file from File Manager into Program Manager. With the file's icon highlighted in Program Manager, press **<Alt>-<Enter>**, and add the parameter **/S** to the end of what's already in the command-line text box. You can then start that particular screen saver as easily as any application. You can place as many screen savers as you like in Program Manager and still set up another—via Control Panel—to actually save your screen.

Now for my addition to that tip: Since I have several messages for different purposes—to let people know when I'm in a meeting, out to lunch, and so on—I need more than one Marquee. Here's how to create several preconfigured versions of this screen saver.

First, make a copy of the file SSMARQUE.SCR (the Marquee screen saver) with a new name but in the same directory. The name must start with SS, be a full eight characters long, and have the extension SCR, as in **SSMARQU2.SCR**. Open the copied screen saver with Windows Write and select *No Conversion* in the resulting dialog box. Once you have the file in Write,

There's An Easier Way To Expand Your Memory

If you've been struggling to get the most out of your PC's memory, there's an easier way. It's called NETROOM® — the award winning memory manager that uses the newest technologies to shatter memory barriers, giving you more memory and a faster system.

> *"NETROOM is the new champ..."*
> — PC MAGAZINE
> Sept. 14, 1993

CLOAKING™ — A BREAKTHROUGH IN MEMORY AND PERFORMANCE

We call it *"Cloaking"*, but after you see what it does, chances are you'll call it amazing! You see, our exclusive Cloaking technology makes the most out of your upper memory by moving the System and Video BIOS and our Cloaked tools into extended memory, where thanks to Cloaking they run faster as 32 bit protected mode applications and take up virtually no DOS memory. This provides more room for your programs than any other memory manager.

And since Cloaking operates in your computer's protected mode, it's ultra-reliable and virtually eliminates crashes.

Cloaking will also upgrade all your BIOSs to the latest, most powerful versions including ISA, EISA, VL-Bus, VGA, PS/2 Micro Channel and Laptop/APM, so it will enhance any 386/486/Pentium™ system.

And, our Cloaked BIOS includes built-in virus protection so you can relax, secure in the knowledge that your data is safe.

CRASH-PROOF

Despite its obvious power and versatility, you don't have to be an engineer to install NETROOM. In fact the installation procedure is so simple it's literally crash-proof!

All you do is type in one command and choose your level of customization – *Conservative* for basic memory management, *Aggressive* for optimal management, and for those of us who have to have it OUR way, there's even a *Custom* mode available.

No matter which you choose, NETROOM will automatically take over from there and create the optimal memory configuration for maximum performance whether you're working in Windows or DOS.

And, our *Customize* program will automatically continue the customization process even if you "warm boot" or turn off your system in the middle.

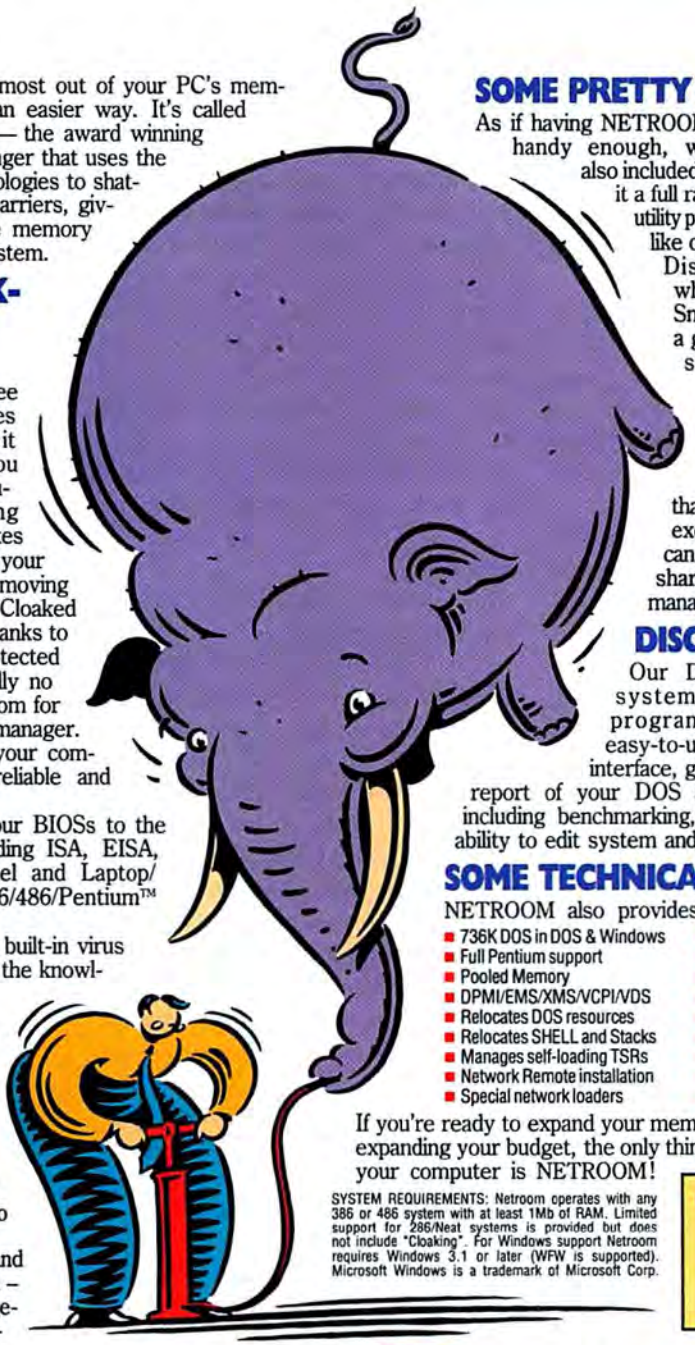
In short, NETROOM isn't only crash-proof, it's also goof-proof!

SCOREBOARD

Comparing memory managers	Helix Software Netroom 3.02	Qualitas Inc. 386Max 7.0	Quarterdeck Office Systems QEMM 7.01
PCWEEK LABS overall score	4.5	3.6	4.0
Ability to reclaim memory below 1M byte (80%)	4.5	3.5	4.0
Ease of setup and configuration (25%)	4.0	3.5	3.5
Variety of memory APIs (12%)	5.0	4.0	4.5

Ratings Legend: 1 = Poor; 2 = Unremarkable; 3 = Meets Expectations; 4 = Better Than Expected; 5 = Outstanding

PC WEEK - July 26, 1993



SOME PRETTY SHARP TOOLS

As if having NETROOM wasn't handy enough, we've also included with it a full range of utility programs like our own Disk Cache which is faster than DOS's SmartDrive but uses only 5K; a graphical Windows and DOS screen saver, and an accelerator which speeds up DOS text screens by up to 20X!

Combine that with our ultra fast RAM drive, virus protection and the fact that *all* these utilities run in our exclusive Cloaked mode and you can see why NETROOM is the sharpest choice in memory managers!

DISCOVER™

Our DISCOVER system analysis program, with its easy-to-use graphical interface, gives you access to a complete report of your DOS and Windows environments including benchmarking, on-line help and even the ability to edit system and batch files.

SOME TECHNICALITIES...

NETROOM also provides all these special features:

- 736K DOS in DOS & Windows
- Full Pentium support
- Pooled Memory
- DPMI/EMS/XMS/VCPI/VDS
- Relocates DOS resources
- Relocates SHELL and Stacks
- Manages self-loading TSRs
- Network Remote installation
- Special network loaders
- Support for DOS 6 Multi-config
- Support for all disk compression
- ROM "hole" scan
- Stack overflow protection
- Frame extender for larger TSRs
- Supports up to 256Mb of RAM
- Shadowing and De-Shadowing
- Network adapter detection
- Flexible multi-user licensing

If you're ready to expand your memory *and* performance without expanding your budget, the only thing you should be pumping into your computer is NETROOM!

SYSTEM REQUIREMENTS: Netroom operates with any 386 or 486 system with at least 1Mb of RAM. Limited support for 286/Neat systems is provided but does not include "Cloaking". For Windows support Netroom requires Windows 3.1 or later (WFW is supported). Microsoft Windows is a trademark of Microsoft Corp.

> *"NETROOM is the tops among memory managers"*
> — PC WEEK, PC WEEK LABS
> July 26, 1993

PC MAGAZINE EDITORS' CHOICE
LAN Memory Manager
Jan. 29, 1991

PCWEEKLABS Product of the Week

Windows SOURCES EXPERTS' PICK

PC MAGAZINE EDITORS' CHOICE
Best Utilities
Sept. 14, 1993

1-user $99, 4-users $179 + s&h

1-800-451-0551

NETROOM3

HELIX SOFTWARE CO. 47-09 30th St., L.I.C., N.Y. 11101 (718) 392-3100

Circle 90 on reader service card

use *Find•Replace* to replace all instances of **SSMARQUE** with **SSMARQU2** (or whatever file name you chose). With the Replace dialog box still up, replace all instances of **MARQUEE** with **MARQUE2** (the name can be anything you like, as long as it's seven characters long). Save the file and exit Write.

Now if you enter the Control Panel's Desktop option, you'll notice MARQUE2 in the list of screen savers. You can configure this choice independently of the original Marquee, so you can use one to display your pager number and another to say that you're in an important meeting.

James R. Erickson, Coon Rapids, Minnesota

Editor's note: This tip, like a few others that have appeared in *Star-Dot-Star*, reveals a use of Windows Write for which it was probably never intended: as a binary editor that can patch applications. The 'No Conversion' option allows you to change the text within any binary file—as long as your new text is exactly the same length as what it's replacing.

No Boots Indoors, Please

I operate a cluster of PCs whose screens and keyboards are available for students and the general public. For security reasons, we keep the systems themselves locked up behind a counter and want to make sure no one can reboot the machines from their keyboards.

I've designed a small TSR called NOBOOT.COM that protects against keyboard reboots. The program works by monitoring the keyboard and preventing the BIOS from seeing the <Ctrl>-<Alt>-<Delete> sequence. Once you install this TSR, the only ways to reboot the machine are by turning it off, hitting the reset switch, or running a program that bypasses the keyboard and forces the machine to restart. This program can also prevent users from rebooting during critical operations such as database transactions and hard disk defragmentation.

Brett Wreely, Pocolo, Colorado

Editor's note: To create NOBOOT.COM, copy **FIGURE 2** to a file called NOBOOT.SCR, then type **DEBUG < NOBOOT.SCR** at the DOS prompt. NOBOOT.COM will appear in the current directory. If you're on PC World Online, you can save yourself the trouble of typing the DEBUG script and download NOBOOT.COM ready-made. Note that for security reasons, this TSR can't be uninstalled; once you load it—from AUTOEXEC.BAT or otherwise—you will not be able to reboot from the keyboard.

Get a Temp

If you haven't already done so, it's a good idea to create a directory on your hard disk for temporary files and to tell DOS and Windows where it is. DOS and Windows automatically put their files on the boot drive, but you may have good reasons to use a different drive and directory. For instance, you may want to place your temporary files on a secondary hard drive partition to protect your main one, or on a RAM disk to improve performance. Tell DOS and Windows where to find your temporary directory by including the command **SET TEMP=*d*:\TEMP** (*d* represents the drive where you want this directory located) in your AUTOEXEC.BAT file.

Why is choosing your own TEMP directory location so important? Both DOS and Windows have a tendency to use up a lot of disk space in that directory—the DOSSHELL task switcher stores 640K for every background task—and your C: drive can quickly run out of space. By placing TEMP on another drive, you can ensure that DOS and Windows don't put their garbage

```
N noboot.com
E100 EB 6B 90 00 00 00 00 50 1E B8 40 00 8E D8 A0 17
E110 00 24 0C 3C 0C 75 0D E4 60 24 7F 3C 53 75 05 80
E120 26 17 00 FB 1F 58 2E FF 2E 03 01 43 74 72 6C 2D
E130 41 6C 74 2D 44 65 6C 20 44 65 66 65 61 74 20 49
E140 6E 73 74 61 6C 6C 65 64 0D 0A 43 6F 70 79 72 69
E150 67 68 74 20 28 43 29 20 31 39 39 33 20 42 72 65
E160 74 74 20 57 72 65 65 6C 65 79 0D 0A 24 B8 09 35
E170 CD 21 2E 89 1E 03 01 2E 8C 06 05 01 BA 07 01 B4
E180 25 CD 21 BA 2B 01 B4 09 CD 21 CD 27
RCX
8C
W
Q
```

FIGURE 2: TO BLOCK OUT KEYBOARD REBOOTS, use this hex code to create a protective TSR for your AUTOEXEC.BAT file.

PC WORLD GIVES YOU A WINNING HAND!

Tired of flipping through user manuals?

Can't *find* the user manual?

Need lightning-quick access to key commands and features?

Need a software reference you can take anywhere?

PC WORLD'S NEW INSTANT REFERENCE CARD IS YOUR BEST BET.

This monthly pullout card gives you a full house of tips on using essential applications. One side provides basic commands that get you started; side two raises the stakes, with advanced pointers to help experienced users squeeze every bit of productivity out of their software and hardware investment.

LOOK FOR THESE INSTANT REFERENCE CARDS:

WordPerfect
Microsoft Word
Windows 3.0
Procomm Plus
Ventura Publisher
Paradox
Excel
PageMaker
1-2-3
DOS
CompuServe
...and more!

PC WORLD

Instant Reference Card #44

For use with PC World Instant Reference Card Portfolio

FILE COMPRESSION: PKZIP 2.0

PKZip compresses single files and groups of files into container, or ZIP, files. Compressed files use less disk space and are easier to transfer by floppy or modem. Use PKZip's two major commands, **PKZIP** and **PKUNZIP**, to compress (zip) and uncompress (unzip) files, manage ZIP files, and control how compression operates. Enter the commands at the DOS prompt.

Note: Keys to press are shown here in **boldface**. *Italic* indicates a variable entry you must provide (for example, *d:* means specify a drive). Brackets surround an optional entry (do not type the brackets). A bullet (•) links menu and option names in a series. Ellipses (...) indicate parameters that may be used more than once.

COMPRESSING FILES

To compress files, the command PKZIP must be followed by a space and the name of the ZIP file you want to create. You can also include multiple, case-sensitive options (each indicated by a leading hyphen or @ sign) and other parameters to control PKZIP. To create a ZIP file in a directory other than the default, include the drive and/or directory path before the ZIP file's name. For example, you can indicate which files or groups of files you want, and don't want, zipped or tell PKZIP to make your ZIP file as small as possible. A typical command looks like: **PKZIP A:ZIPFILE C:\UTL\PROG.COM C:\UTL*.DAT -ex -z -ac -&**

Note: By default, PKZIP copies the files it is compressing into a ZIP file. To move the files into a ZIP file rather than copy them, add the **-m** parameter to the end of the command line. Also, you can get help by typing **PKZIP -h**.

Fold Here

Task	Parameter(s)
Zip specific file(s)	[*d:*][*\path*]*filename.ext*...
Zip all files in current directory	Omit specifying source files
Zip all files in specific directory(s)	*d:\path*.*...
Zip directory's files having specific extension(s)	[*d:*][*\path*]*.ext*...
Zip files listed in ASCII text file	@[*d:*][*\path*]*textfile.ext*
Exclude specific file(s) from being zipped	**-x**[*d:*][*\path*]*filename.ext*...
Exclude files with specific extension(s) from being zipped	**-x**[*d:*][*\path*]*.ext*...
Use maximum compression (slow)	**-ex**
Use normal compression and speed (default)	**-en**
Zip fast (less compression than normal)	**-ef**
Zip super fast (least compression)	**-es**
Zip without compression	**-e0**
Include only files dated today	**-t**
Include only files dated on or after specific date	**-t***mmddyy*
Include only files dated before specific date	**-T***mmddyy*
Include directory's and its subdirectories' files	**-rP**
Remove hidden/read-only/system file attribute from zipped files	**-jh/-jr/-js**
Include hidden/system files	**-wh/-ws**
Span floppies, if ZIP file larger than target	**-&**
Zip current drive and all subdirectories, spanning floppy disks if necessary	**-&s**
Store volume label of drive *d:* in ZIP file	**-$***d*
Create 127-character ZIP file comment	**-z**
Create 59-character comment for each file being zipped	**-ac**
Encrypt and password-protect ZIP file	**-s***password*

MODIFYING COMPRESSED FILES

To modify a ZIP file, the command PKZIP must be followed by a space, the name of the ZIP file you want to change, case-sensitive options, and sometimes other parameters. To work with a ZIP file in a directory other than the default, include the drive and/or directory path before the ZIP file's name.

Note: The last three entries are commands, not PKZIP parameters.

Task	Parameter(s)
Update ZIP file if specific file(s) is newer than file of same name in ZIP file (or is not currently in ZIP file)	**-u** [*d:*][*\path*]*filename.ext*...
Delete specific file(s) from ZIP file	**-d** [*d:*][*\path*]*filename.ext*...
Delete files having specific extension	**-d** [*d:*][*\path*]*.ext*...
Keep ZIP file's date when adding or deleting its files	**-k**
Set date of ZIP file to date of newest file within it	**-o**
Modify 127-character ZIP file comment	**-z**
Add or modify 59-character comment for each file in ZIP file	**-c**
Display actual size, compressed size, ratio, date, time, attributes, name, and comment of each file in name order, pausing for each screenful	**-vncm**

Fold Here

Turn ZIP file into self-unzipping (EXE) file	**ZIP2EXE** [*d:*][*\path*]*zipfile.ext*
Return self-unzipping file to normal ZIP file	**ZIP2EXE -e** [*d:*][*\path*]*filename*
Fix corrupt ZIP file	**PKZIPFIX**

UNCOMPRESSING FILES

To uncompress a ZIP file's files, the PKUNZIP command must be followed by a space and the name of the ZIP file. Case-sensitive options and other parameters control PKUNZIP. To uncompress a ZIP file that is in a directory other than the default, include the drive and/or directory path before the ZIP file's name. A typical command looks like: **PKUNZIP A:ZIPFILE C:\UTIL -d -Jhrs**

Note: You can get help by typing **PKUNZIP -h**.

Task	Parameter(s)
Unzip files into specific directory	[*d:*][*\path*]
Unzip files into default directory	Omit specifying directory
Recreate zipped files' directory structure below default or specific directory	**-d** [*d:*][*\path*]
Unzip password-protected ZIP file	**-s***password*
Unzip files in order of name/date/extension	**-en/-ed/-ee**
Unzip files in reverse order of name/date/extension	**-ern/-erd/-ere**
Unzip only files that are newer than those (or are not located) in target directory	**-n**
Print specific zipped ASCII file(s) on LPT/COM printer	*filename.ext*... **-p***x*/**-pc***x*
Print specific zipped binary file(s) on LPT/COM printer	*filename.ext*... **-pb***x*/**-pbc***x*
Test unzipping of ZIP file	**-t**
Display file, pausing for each screenful	*filename.ext* **-cm**
Retain all attributes of files being unzipped	**-Jhrs**
Label target disk *d:* if label was stored in ZIP file	**-$** *d:*

PC WORLD

Instant Reference Card #44

For use with PC World Instant Reference Card Portfolio

DISK COMPRESSION: DOUBLESPACE AND STACKER 3.1

Disk compression programs free disk space by shrinking the files you store in the virtual drive(s) the programs create. The virtual, compressed drive is actually a read-only, system, and hidden volume file on an uncompressed host drive. A volume file is mounted when it is assigned its own drive letter. The compression ratio compares the actual amount of disk space needed to store an uncompressed file against the estimated amount needed to store it compressed.

STACKER 3.1 FOR DOS

To perform a task, enter the appropriate command at the DOS prompt or enter the command **STAC** and use that program's menus.

Note: Compressed removable media can be used in systems without Stacker.

Task	DOS command	STAC menu
Compress hard disk	**SETUP**, **R**estart, select drive, **C**ontinue • **E**ntire Drive • **S**tack • **R**estart	**H**ard Disk • **R**estart, select drive, **C**ontinue • **E**ntire Drive • **S**tack • **R**estart
Create compressed drive from host's free space (sss.s=MB to allocate)	**CREATE** *d*: **/S=**sss.s	**H**ard Disk • **R**estart, select drive, **C**ontinue • **F**ree Space • **u**se, type amount, **S**tack • **R**estart
Set estimated compression (e.g., 2.0)	**SDEFRAG /GL** *d*:, set ratio, **<Enter>** • Perform changes on Stacker drive	**E**xpected Compression, select drive, set ratio, **<Enter>** • **P**erform changes on Stacker drive
Increase compressed drive's size	**SDEFRAG /GP** *d*:, **I**ncrease Stacker drive size, set size, **<Enter>** • **P**erform changes on Stacker drive	Stacker Drive **S**ize, select drive, **I**ncrease Stacker drive size, set size, **<Enter>** • **P**erform changes on Stacker drive
Decrease compressed drive's size	**SDEFRAG /GP** *d*:, **M**ore uncompressed space available, *key*, set size, **<Enter>** • **P**erform changes on Stacker drive	Stacker Drive **S**ize, select drive, **M**ore uncompressed space available, *key*, set size, **<Enter>** • **P**erform changes on Stacker drive
Tune compression versus speed	**TUNER**, select option, **C**ontinue • OK	**S**tacker Tuner, select option, **C**ontinue • OK
Uncompress drive, copying files to host	**UNSTACK** [*d*:]	**U**nstack, select drive, Remove Stacker drive • Yes—proceed • **<Enter>**
Delete drive and its files	**REMOVDRV** *d*:, Remove Stacker Drive, Yes	n/a
Mount/unmount floppy drive	**STACKER** *d*/–*d*	n/a
Get drive information	**REPORT** [*d*:]	**C**ompression Report, select drive
Defragment drive quickly/fully/fully with recompression	**SDEFRAG** [*d*:] **/Q** or **/F** or **/R**	Stacker **O**ptimizer, select drive, **Q**uick Optimize/**F**ull Optimize/**R**estack
Check and fix	**CHECK** [*d*:] **/F**	Drive **I**ntegrity, select drive

STACKER 3.1 FOR WINDOWS

Compress existing drive	Open Stacker Setup, OK • **R**estart, select drive, **C**ontinue • **E**ntire Drive • **S**tack • **R**estart
Create compressed drive from free space of host	Open Stacker Setup, OK • **R**estart, select drive, **C**ontinue • **F**ree Space • **u**se, type free space, **S**tack • **R**estart
Run Stackometer to view drive's compression ratio, usage, and fragmentation	Switch to Program Manager, double-click Stackometer icon, **S**ettings • **S**elect Drive, select drive, OK

STACKER 3.1 FOR WINDOWS (continued)

Update Stackometer gauges*	**S**ettings • **R**efresh
Set drive's compression ratio*	**T**ools • **S**et Expected Compression • OK, *key*, type new ratio, **<Enter>** • Perform changes on Stacker drive • **<Enter>**
Defragment drive quickly/fully/fully with recompression*	**T**ools • **Q**uick Optimize/**F**ull Optimize/Full Optimize and **R**estack • OK • **C**ontinue • **<Enter>**
Tune compression versus speed*	**T**ools • **T**une Stacker, select option, OK; or run Stacker Tuner from Program Manager
Get drive information	Switch to Program Manager, **F**ile • **R**un, **C:\STACKER\REPORT**, OK
View selected files'/drive's compression ratio in File Manager	**S**tacker • **F**ile Info/**D**isk Info

*Run Stackometer to access the Settings and Tools menus.

MS-DOS 6.0 AND 6.2 DOUBLESPACE

To perform a task, type **DBLSPACE** and then either type a space and the appropriate command line switch or press **<Enter>** and use the program's menu.

Note: DoubleSpace doesn't run in Windows. In the DOS 6.0 version, you must mount a compressed floppy disk before you can use it. DoubleSpace doesn't compress 360K disks.

Fold Here

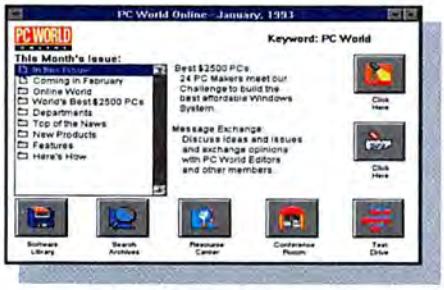
Fold Here

Task	DOS command switch	DBLSPACE menu
Compress existing drive *d1*: (specify host's drive letter *d2*: and *size* in MB)	**/COM[PRESS]** *d1*: [**/NEW[DRIVE]=***d2*:] [**/RES[ERVE]=***size*]	**C**ompress • **E**xisting Drive, select drive, select host's free space and drive letter, Continue • **C**
Create compressed drive *d2*: from free space of host *d1*:, reserving *size* in MB of free space on host	**/CR[EATE]** *d1*: [**/N[EWDRIVE]=***d2*:] [**/RE[SERVE]=***size*]	**C**ompress • **C**reate New Drive, select host, select host's free space and new drive's compression ratio and letter, Continue • **C**
Set estimated compression (e.g., 2.0)	**/RA[TIO][=***r.r*] [*d*: or **/ALL**]	**D**rive • Change **R**atio, enter ratio, OK
Uncompress drive*	**/UNCOMPRESS** *d*:	**T**ools • **U**ncompress • **Y**es
Get drive information	[**/INFO**] *d*:	**D**rive • **I**nfo
List local drives	**/L[IST]**	Start command menu
Set size of compressed drive *d*: (*size* is MB used on host)	**/SI[ZE][=***size*] *d*: (omit =*size* to minimize size of compressed drive)	**D**rive • Change **S**ize, enter amount to leave free on host, OK
Limit drive letters DoubleSpace can use*	**/LASTDRIVE=***d*	**T**ools • **O**ptions • *d* • OK
Turn removable-disk automounting on/off*	**/AUTOMOUNT=0/1**	**T**ools • **O**ptions • Enable automounting
Turn detection of data, code corruption on/off*	**/DOUBLEGUARD=0/1**	**T**ools • **O**ptions • Enable DoubleGuard safety checking
Mount DBLSPACE.*nnn* as drive *d*:	**/MO[UNT][=***nnn*] *d*:	**D**rive • **M**ount • OK
Unmount drive	**/U[NMOUNT]** [*d*:]	**D**rive • **U**nmount • OK
Format drive	**/F[ORMAT]** *d*:, **Y**	**D**rive • **F**ormat • OK • **Y**es
Delete drive	**/DEL[ETE]** *d*:, **Y**	**D**rive • **D**elete • OK
Defragment drive	**/DEF[RAGMENT]** [*d*:]	**T**ools • **D**efragment • OK • **Y**es
Check (and fix) drive	**/CHKDSK** [**/F**] [*d*:]	**T**ools • **C**hkdsk • **C**heck/**F**ix

*Available only in MS-DOS 6.2.

For use with PC World Instant Reference Card Portfolio

The More Windows You Open, The Cooler It Gets.℠



PC WORLD Online

Expert Computing Advice

Internet E-Mail Gateway

Windows Advice & Support

Fast, Easy Downloading

More Than 30,000 Software Files

Try PC WORLD on America Online FREE Sign On and Enter to Win a Pocket Modem!

There's only one way to appreciate America Online's capabilities – you have to try the service. So we're willing to send you our software and give you time online to explore our service, absolutely free.

America Online offers *PC WORLD Online*, where you can send opinions and questions directly to *PC WORLD* editors, and receive answers. Download software they recommend. Study Buyers' Guide reports. Read equipment reviews. Check out past *PC WORLD* issues. Plus, America Online offers you news and entertainment, computing support, thousands of programs to download, and much more – all on the most "clickable" service there is.

Sign on this month and use keyword PCWORLD to enter the drawing to win a pocket modem. Just fill out and mail the attached postage-paid reply card, or call **1-800-827-6364, Ext. 8464.**

Subscribe today and you could win the Home Office from Brother!

The Intellifax 600 desktop phone, fax and copier, the HJ-400 ink jet printer, and the P-Touch III Electronic Labeling System. With all three, you're ready to take on the world.

Circle 155 on reader service card

STEREO PC™

THE BRAINS BEHIND MULTIMEDIA

22 SOFTWARE TITLES INCLUDE:
- Animals
- Encyclopedia
- Mavis Typing
- Chessmaster 3000
- U.S. Atlas
- World Atlas
- Kodak Photo CD
- Family Doctor
- Windows 3.1
- MS DOS 6
- Monologue
- HSC Interactive
- On-Line Audio Track
- Jukebox
- Windat

and more...

Audiophile Case w/Built-in Dual Channel Low Distortion Stereo Amplifiers

Built-in Anti-magnetic Air Suspension Speakers w/Research Designed Speaker Baffles

Control/Input Panel

- Powerful 486 Processor
- 3 Slot VESA Local Bus Motherboard
- Pentium Upgradable Motherboard
- 16 Bit Living Room Quality Sound
- 32 Bit VESA Local Bus IDE Controller
- Dual Speed CD-ROM
- 5 Sound Standard Compatibility
- 22 Software Packages worth thousands of dollars
- Windows Accelerator with 1 MB of RAM
- 4 MB of High Speed RAM
- Audiophile Case, Front Panel Controls, Input Jacks, Tuned Speaker Baffles
- Microphone and Headset included
- Microsoft Compatible Mouse
- 101 Enhanced Keyboard
- Lifetime Labor and Motherboard Warranty
- One Year On-Site Service
- Toll Free Technical Support
- .28mm 14" Monitor 1024x768
- Most Orders Shipped In 48 Hours

Here's what the critics say...

"Stereo PC is a product breakthrough by which future multimedia offerings will be judged."
— Computer Monthly Magazine Oct. '93

"Stereo PC is an idea whose time has come. Stereo PC oozes quality."
— Reseller World Magazine Oct. '93

"Stereo PC is bound to pique your interest."
— Windows Magazine Nov. '93

SYSTEM CONFIGS	130MB	212MB	340MB	520MB
486SX25 VESA	$1899	$1949	$2099	$2549
486SX33 VESA	$1949	$1999	$2149	$2599
486DX33 VESA	$2099	$2149	$2299	$2749
486DX66 VESA	$2299	$2349	$2499	$2949

OPTIONS (add to the prices above)
- .28mm 14" Non-Interlaced Monitor 1024x768 ..... $29
- .28mm 15" Non-Interlaced Monitor 1280x1024 ..... $219
- .31mm 20" Non-Interlaced Monitor 1280x1024 ..... $916
- .26mm 17" Non-Interlaced Monitor 1280x1024 ..... $539
- 2nd Year On-site Service Warranty By Genicom $99
- Epson Stylus Ink Jet 800 ..... CALL
- All Media Floppy $99
- Each 4MB RAM Upgrade $249
- 9600 Fax/Modem $49
- 16mb (2mb RAM Inc.) Cache IDE Controller $199
- Epson ActionLaser 1500 ..... $659
- Epson Stylus 300 ..... $279

CALL FOR A FREE VIDEO

800-998-0343

FAX 301-695-0478

((((STEREO PC™))))

A Division of TESCO Inc. Established 1978. Proud to be a 1987,88 INC 500 Fastest Growing Company. 7313 Grove Road • Frederick MD 21701 • Hours Mon.-Fri. 9AM-9PM Sat 10AM-3PM EST • NO CHARGE CARD SURCHARGES • FREIGHT CHARGES NOT REFUNDABLE • ALL TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. ©Copyright 1993 TESCO Inc.

Circle 112 on reader service card

among your good data. Likewise, many compilers and other applications create temporary files, and a SET TEMP command will give you explicit control over the locations of these files.

William H. Perry Jr.,
Clifton Forge, Virginia

Editor's note: I almost dismissed this tip as unimportant until last week, when a telephone support technician asked me to help track down a bug by booting from a "clean" AUTOEXEC.BAT file. Naturally, because the empty AUTOEXEC.BAT didn't set a TEMP variable, Windows put its temporary files on my C: drive, using up most of the remaining space and causing even more errors than usual. Things calmed down once I had typed in the command SET TEMP=E:\TEMP and steered Windows to a less crowded drive.

If you want to send your temporary files to a RAM disk, you should still create a TEMP directory on it. Placing your temporary files in a drive's root directory—even if those files are the only ones on the drive—can cause problems since there are limits to how many files can go into a root directory.

Mimeless Mines

Windows 3.1's Mine Sweeper game is normally silent. But you can turn on its hidden sound feature by editing the file WINMINE.INI (which appears in your WINDOWS directory after you've played the game and set the options). Simply add the line **Sound=3** at the top of the file using Notepad or any other text editor. After you save the file, the next time you run Mine Sweeper you'll get musical effects through the PC speaker when you win or lose.

John Hankel,
Portland, Oregon

Editor's note: If you're using the Sound Driver for PC Speaker (see "The World's Cheapest Sound Card," *Star-Dot-Star*, December 1993), Mine Sweeper may remain silent. However, if you're not using a sound driver, or you're using one for an actual sound card, Mine Sweeper will play its music on your internal speaker.

By Brett Glass

Brett Glass is a contributing editor for PC World. Star-Dot-Star *welcomes your tips, macros, batch files, and short programs. See page 12 for contact information.*

Now You Can Count On Us For A Lot Less.

~~Reg. $595.~~ Now Only

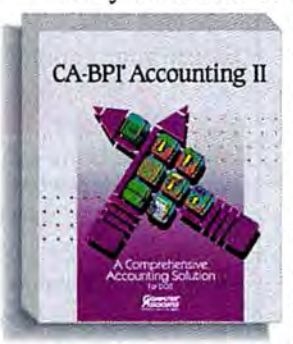
$229.

*For a limited time only.

About $400 less.

But what counts the most isn't the savings, but the fact that CA-BPI® Accounting II is one of the all-time, best-selling accounting software programs in the world. Literally millions of small to medium businesses count on CA-BPI Accounting II.

Now you can too. For a fraction of what it usually costs you can get it all. All the functionality you'll ever need. Totally integrated and with automatic double-entry. Network capabilities for up to 40 users. Special intuitive pull-down menus and a "selector" that makes look-up a snap. With customizeable financial statements, reports, invoices and purchase orders that can help your company look like a million bucks.



- *General Ledger*
- *Accounts Receivable*
- *Accounts Payable*
- *Order Entry*
- *Inventory Control*
- *Payroll*
  US And Canadian
- *LanPak™*
- *Data Security And Integrity*
- *Technical Support*

See Your Local Dealer Or Call 1-800-225-5224, Dept. 32108.

This offer is for a limited time so pick up your copy of CA-BPI Accounting II today. Then use it to count all the money you saved.

COMPUTER ASSOCIATES®
Software superior by design.

New CA-BPI® Accounting II

* Based upon suggested promotional retail pricing. Actual dealer pricing may vary. © Computer Associates International, Inc., One Computer Associates Plaza, Islandia, NY 11788-7000. All product names referenced herein are trademarks of their respective companies.

Circle 39 on reader service card

PC WORLD CLASSIFIED

Product Category	Business Class	Classified
HARDWARE		
Communications	266	
Computer Systems		269
Memory Cards	267	
Peripherals	267	269
Security	266	
Storage/Backup Devices	267	
SOFTWARE		
Business Applications		271
Church Applications		271
Data Entry		271-272
Education		272
Entertainment		272
Financial		272
Flow Charting		272
Foreign		272
Graphics		272
Mail Order		272
Maintenance Management		272
Medical		272
Music		272
On-Line Service		273
Public Domain/Shareware		272
Real Estate		273
Restaurant Point of Sales		273
Shareware	268	
Statistics		273
Surveys		273
Utilities		273
MISCELLANEOUS		
Accessories	268	269
Bar Coding		269-270
Computer Insurance		270
Data Recovery		270
Disk Copy Service		270
On-line Services	268	
Supplies		270-271

FOR ADVERTISING RATES AND INFORMATION

CALL 1-800-262-9885

PC-EXPANDER PLUS™

Connect up to 8 VGA Monitors, Mice and Keyboards to a Single PC

- PC/AT, PS/2 and 100% Compatibles
- VGA up to 1024 x 768 Resolution
- Selectable Takeover Delay
- Use either PS/2 or Serial Mice

CYBEX

4912 Research Drive • Huntsville, AL 35805 U.S.A.
(205) 430-4000 • FAX (205) 430-4030
Dealer Program Available — Made in USA

CIRCLE 516 ON READER SERVICE CARD

URGENT!

STOP COMPUTER THEFT

Would you leave $2500 in cash on your desk and go to lunch?

Then why leave your computer?

Secure your equipment with the . . .

Kablit™ Security System

Kablit products are known for their quality and reliability. Our customers can testify to the security effectiveness of our products and they still have their computers to prove it.

· Master Lock™ included with each security system.
· Lifetime warranty on all parts.

Security packages for all types of office equipment:

- COMPUTERS
- PRINTERS
- LASER PRINTERS
- MONITORS
- SCANNERS
- HARD DRIVES
- FAX MACHINES
- OTHERS

Call for your free catalog:

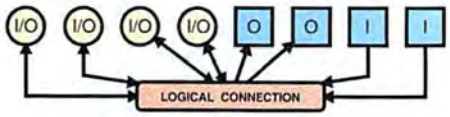
Secure-It
18 Maple Court
East Longmeadow, MA 01028

413-525-7039
800-451-7592

CIRCLE 433 ON READER SERVICE CARD

PRINTER SHARING & MEMORY

I/O = input /output
○ = serial
□ = parallel



800-238-9415

LCX-1000 (1Mb) $495
8 ports; 4 serial I/O; 57,600 bps
2 parallel in, 2 parallel out

LC-256 (256Kb) $399
LC-512 (512Kb) $449
8 ports; 4 serial I/O; 19,200 bps
2 parallel in, 2 parallel out

LXFR-ETC $49
PC-to-PC File Transfer for DOS, Windows & OS/2, 4 user license

PB-42PP-256Kb $249
PB-42PP-1Mb $299
PB-42PP-4Mb $449
6 parallel ports; 4 in / 2 out
Upgradable to 4Mb; 25,000 cps

LC Jr.-256 (256Kb) $199
LC Jr.-512 (512Kb) $249
5 ports; 4 serial in, 1 parallel out
Up to 115,200 bps

LC-41PAS $69
5 parallel ports; 4 in / 1 out
Smart-switch; 25,000 cps

SPPS *(NO Xon/Xoff)* $49
9600 bps to 115,200 bps,
Serial / Parallel Converter

PB-11PP-1Mb $199
2 parallel ports; 1 in / 1 out
Upgradable to 16Mb; 25,000 cps

PC SIMMs
EISA SIMMs
HP4 & HPIIIsi
PCMCIA
TOSHIBA
MAC SIMMs
POWERBOOK

LOGICAL CONNECTION® 4660 Portland Road NE #108 Salem, OR 97305-1658 Tech.: (503) 390-9375 FAX: (503) 390-9372

CIRCLE 420 ON READER SERVICE CARD

FACT: The majority of PC WORLD subscribers do not read any other major PC publication on a regular basis (3 out of 4 Issues.)

73% do not read PC Magazine
79% do not read PC Computing
90% do not read Byte

61% do not read any of the above

Call Now For More Information 800-262-9885

PC WORLD'S PC-Proficient Managers are involved throughout the purchase process

- 81% determine the need for products & their features
- 85% suggest, evaluate or recommend specific brand models
- 55% make the final buying decision

Call 1-800-262-9885 For More Details

9-TRACK FOR PCs

Mainframe To PC Data Interchange

Rock solid solutions, rock bottom prices.
Direct from the manufacturer. 1600/3200/6250 bpi.

- The most trusted name in 9-track, since 1980
- Powerful, easy-to-use software tools included

Overland Data Inc.
800•729•8725
7 AM - 5 PM Pacific Time

TEL: 619-571-5555
FAX: 619-571-0982
EUROPE:
TEL: (+44) 734-891891
FAX: (+44) 734-891897

Ask about 3480 with IDRC.

CIRCLE 430 ON READER SERVICE CARD

PS/2 Hard Drives

PS/2 50 50z 55sx 60 70 80 P70

INTERNAL DRIVES - *May be used as a high performance replacement or to co-exist with original IBM drive. Compatible with DOS 3.3, 4.01, 5.0, OS/2 2.0 and Novell. Includes IDE or SCSI-2 microchannel controller, hard drive, mounting kit, ribbon & power cable, manual, and hardware.*

106mb, 15ms, Internal Seagate IDE Drive Kit $383
130mb, 15ms, Internal Maxtor IDE / SCSI Drive Kit ..... $414/$439
213mb, 15ms, Internal Maxtor IDE / SCSI Drive Kit ..... $486/$523
340mb, 13ms, Internal Maxtor IDE / SCSI Drive Kit ..... $589/$689
540mb, 8.5ms, Internal Maxtor IDE / SCSI Drive Kit ..... $1,147/$1,157
1.2gb, 12ms, Internal Toshiba SCSI Drive Kit $1443

PS/2 Model 25, 30, 30-286
42mb/106mb Hard Drive Kit $189/$253
125mb/200mb Hard Drive Kit $284/$356

External SCSI drives available from 125 mb to 1.75 gb. Includes SCSI-2 controller, external case with drive installed and configured, 6' SCSI cable. Free drivers for CD-Rom drives or Novell 286 & 386

General Technics *1 Year Warranty - 10 Day Money Back Guarantee*
1-800-GT-SALE-8
Call today for your FREE Catalog!
Tel: (516) 981-9473
Fax: (516) 981-5038
38 Rayner Ave
Ronkonkoma
NY 11779
Open 9am to 6pm EST, Mon-Fri

CIRCLE 425 ON READER SERVICE CARD

Explore the Internet - FREE!

DELPHI, a leading international online service, now offers full access to the Internet. You can explore this incredible electronic network with no risk. You get 5 hours of evening/weekend access to try it out for free!

Use electronic mail to exchange messages with over 10 million people throughout the world. Download programs and files using "**FTP,**" connect in real-time to other networks using "**Telnet,**" and participate in "**Usenet Newsgroups**" the world's largest bulletin board with over 3500 topics. If you're not familiar with these terms, don't worry; DELPHI has expert online assistants and a large collection of help files, books, and other resources to help you get started.

After the free trial you can choose from two low-cost membership plans. With rates as low as $1 per hour, no other online service offers so much for so little.

5-Hour Free Trial!

Dial by modem, 1-800-365-4636*
Press Return once or twice
At Username, enter **JOINDELPHI**
At Password, enter **PCW41**

DELPHI

Questions? Call 1-800-695-4005 (voice)
Send e-mail to INFO@delphi.com

*Current Internet users can Telnet to delphi.com instead. Complete details provided during the toll-free registration

PC WORLD'S PC-Proficient Managers are involved throughout the buying process. They have the budget authority to sign off on final purchases and the knowledge necessary to recommend and evaluate brands

Call The PC WORLD Classified Department Now 1-800-262-9885 For More Details

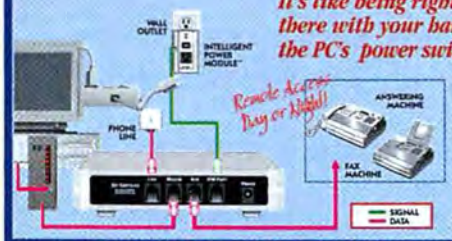
REMOTE POWER ON/OFF

$169.95

- Power on your PC from anywhere in the world!
- Reboot a Locked-up Remote PC.
- Share a Modem & Fax Machine on a single phone line.

w/pcANYWHERE 1.0 for Windows $199.95

It's like being right there with your hand on the PC's power switch!



30-DAY TRIAL!

Server Technology
1288 Hammerwood
Sunnyvale, CA 94089
Ph. 408-745-0300
Fax 408-745-0392
MC, VISA Accepted

TO ORDER CALL 1-800-835-1515

CIRCLE 410 ON READER SERVICE CARD

FACT: PC WORLD delivers the managers crucial to your marketing success. 84% of PC WORLD'S employed subscribers are managers. The key people your advertising must reach in today's highly competitive marketing environment.

Call Now For More Information 800-262-9885

Increase Productivity with Internet Archives

This disc **CICA MS Windows** contains a copy of CICA, the internet's largest Windows archive. Hundreds of megabytes of MS Windows programs on your desktop save you time and money. Our friendly shell makes accessing all these files easy. Includes hundreds of utilities, screen savers, backup/restore programs, diagnostics, data conversion programs, games, demos for many commercial Windows programs, fonts, icons and bitmaps. There are programming tools for C, C++, Toolbook, Turbo Pascal, and Visual Basic. This disc is configured for Opus, RBBS, Pcboard, Wildcat, and Spitfire BBS's. Made in April 1993. **CDROM $24.95***

Simtel MSDOS CDROM $24.95*
Packed full of the world's highest quality MSDOS shareware from the internet — every DOS user should own this disk! With 8,818 files, Simtel contains something for everyone. Includes our friendly shell program to help you find whatever you need, whether it be utilities, communications programs, BBS's, editors, documentation, databases, BBS index files. Made in May 1993.

Giga Games CDROM $39.95*
An amazing collection of games, from classic arcade to the latest windows simulations to educational games for all ages. BBS ready. Made in July 1993.

**Shareware programs require separate payment to authors if found useful.*

CALL, SEND EMAIL OR FAX TODAY! 1-800-786-9907
Info@cdrom.com
FAX +1-510-674-0821

Full money-back guarantee

$5 S&H per order (USA, Canada, Mexico)
$10 overseas +1-510-674-0783 AMEX/VISA/MC/COD

Walnut Creek CDROM
4041 Pike Lane, Suite D-539
Concord, CA 94520

CIRCLE 416 ON READER SERVICE CARD

Hardware

PERIPHERALS

9-Track 3480

Fastest, Most Reliable Drives for Micro's

6250
3200
1600
800

Intuitive Software, Super Support, & SCSI Too!

800/842-0708

HAUPPAUGE, NY • 516/273-5900

TDX PERIPHERALS

The Only Professional Choice

CIRCLE 513 ON READER SERVICE CARD

Say Goodbye to Office Clutter

AV-800 OMNI-SCANNER

1899.00

- High Speed B/W Scanning
- 10 pages/min. at 300 DPI
- High Quality Color Scanning up to 1200 DPI in 16.7 million colors
- 50 pp au. feeder & flatbed operation. TWAIN driver and software included

Personal Archiving

PA-100 Personal Archiver

699.00

- 256 Grayscale, 600 DPI Res.
- 10 page auto document feeder
- Includes business card reader, adapter and database software
- Copier function makes perfect copies on any laser printer
- Includes FREE I-Photo Plus

Computer Friends Inc.

14250 NW Science Park Dr. Portland OR 97229

To Order: 1-800-547-3303 Fax: 503-643-5379

CIRCLE 483 ON READER SERVICE CARD

9-Track Tape Subsystem

Now you can exchange data files between your IBM PC/XT/AT and any mainframe or mini-computer using IBM compatible 1600 or 6250 BPI 9-Track tape. Unit can also be used for disk backup. Transfer rate is up to 4 megabytes per minute on PCs and compatibles. Subsystems include 7" or 10½" streaming tape drive, tape coupler card, cables and software.

QUALSTAR

9621 Irondale Avenue
Chatsworth, CA 91311
Telephone: (818) 882-5822

CIRCLE 417 ON READER SERVICE CARD

FACT: 73% of PC WORLD subscribers use Windows!

THE PERFECT TRAVELING NOTEBOOK!

PACKARD BELL

Statesman Notebook

- 486SLC/33MHz with 200MB HD
- 4MB RAM Exp. to 12MB
- 3.5" FDD
- 9.5" Mono Screen or 9.5" Color Passive Screen with 512K
- Ports: 1 Serial, 1 Parallel, 1 Mouse, 1 VGA, 1 PCMCIA
- Integrated J-Mouse
- Software: DOS 6.0, MS-Windows, MS-Works, MS-Money, MS-Productivity Pack, MS-Entertainment Pack

Monochrome	Color
$1599	$2199
#800202.	#800210.

Not affiliated with any former Bell System entity. Intel Inside logo is a registered trademark of Intel Corporation.

ELEK-TEK

Call (800) 395-1000

(708) 677-7660 in Illinois

Over 5,000 National-Branded Computer Products

- Everyday Discounted Prices
- Toll-Free Ordering with FREE Technical Support
- Same Day Shipping on all In-Stock Items

7350 N. Linder Ave.
Skokie, Illinois 60077

ELEK-TEK is not responsible for typographical or printing errors. Prices subject to change without notice.

BP003

CIRCLE 418 ON READER SERVICE CARD

PERIPHERALS

VGA Video Splitters

Display your PC's screen simultaneously on 2, 4, or more monitors.

- Works with all VGA, SVGA, and RGB monitors
- Bright and crisp presentation on all monitors - Guaranteed!
- Extension cables available to 250'
- Prices start at $199
- Made in U.S.A.

H&R Technology
Santa Ana, CA
(714) 641-6607 Fax: (714) 966-1770
Toll Free: (800)959-6139

CIRCLE 443 ON READER SERVICE CARD

COMPUTER SYSTEMS

USED COMPUTERS

IBM, COMPAQ & MAJOR BRANDS Also IBM PCjr & Convertible Accessories, & Service. Computers from $99 Monitors from $49 New CGA Color Monitors $129 IBM 5140 Laptops $349 Software, Keyboards, Parts Hard to find parts FREE CATALOG

Computer Reset
Call (214) 276-8072
P.O. Box 461782
Garland, TX 75046-1782
FAX & BBS (214) 272-7920

PC WORLD

DELIVERS THE BUYERS YOU NEED TO REACH

Study after study has proven that managers proficient with PCs now control the business PC buying process. Make sure your advertising gets maximum exposure in your best target market.

Miscellaneous

ACCESSORIES

FREE GLOBAL CATALOG

204 page guide to computer furniture, supplies and accessories

Dial Toll-Free
1-800-8-GLOBAL

GLOBAL COMPUTER SUPPLIES

11 Harbor Park Dr., Dept 91 PCW
Port Washington, NY 11050

CIRCLE 508 ON READER SERVICE CARD

BAR CODING

Bar Code and Mag-Stripe

- No software changes
- 1, 2, or 3 input devices
- User configurable
- RS-232 readers

Laser wedge reader $1,149
Smart wedge wand $379

Portable MS-DOS units
Wand , CCD, Laser, Swipe, Mag
Auto-discriminates 16 Bar codes
2 year warranty, $ back guarantee

Compatible Reader Systems
Maynard MA 01754
800-217-4307

CIRCLE 404 ON READER SERVICE CARD

BAR CODE READERS

VISA AM EX

AMERICAN MICROSYSTEMS
2190 A Regal Pkwy. • Euless, Texas 76040 • (817) 571-9015

FOR PC, XT, AT, PS/2 & TERMINALS:

- No software changes required
- Data appears as keyboard input
- Reads Code 39, I-2of5, UPC/EAN, Codabar, 128, 93, 11, MSI/Plessey
- Auto-discriminates between codes
- Accepts WAND, SLOT, CCD, LASER, MAG STRIPE

BAR CODE PRINTING SOFTWARE:

- For Epson, OKI, IBM, Dot Matrix and HP LaserJet Printers.
- Prints Code 39, I-2of5, UPC/EAN, Codabar, 128, 93, 11, MSI/Plessey
- Easy To Use

(800) 648-4452 • FAX: (817) 685-6232
30 Day Money Back Guarantee
One Year Warranty

BAR CODING

WORTHINGTON DATA SOLUTIONS

BAR CODE HEADQUARTERS

OFFICES IN USA AND EUROPE

Labeling Software
For PC with Dot Matrix or LaserJet

Windows Version!

- Any Format, Any Size
- Formats for Sears, TCIF, K-Mart, Penny's, AIAG, WalMart, Logmars, etc.
- WYSIWYG Design
- Bar Codes: UCC-128, UPC/EAN, 2of5, 128, Code 39, etc.
- Big Text and PCX Graphics too!
- Powerful, Versatile, Easy to Use
- Imports ASCII data files from dBase, etc.
- LabelRIGHT™ for Windows –**$379**
- Above Label Printed by LabelRIGHT™–**$279**

Thermal Transfer Printer with Labeling Software

- Fargo's Allegro Printer
- Up to 4"label width
- Small size, only 20 lbs.
- Prints UPC/EAN, 2of5, 128, 39
- Scalable text & PCX graphics
- Packaged with LabelRIGHT thermal™ software, serial cable, ribbon & labels
- Complete package, ready to use – **$ 1895**

Bar Code Readers
for PC, XT, AT, PS/2, Macintosh and RS-232 Terminals

New RF Wand

- Attaches as 2nd Keyboard
- UPC/EAN, Code 128, 2of5, MSI, Code 39
- Wand, Magstripe, CCD Slot Badge or Laser Scanner
- **Top Rated by Independent Review**
- Complete With Cordless Radio Wand – **$495**
- Complete with Stainless Steel Wand – **$399**

Portable Bar Code Readers
for PC,XT,AT,PS/2,Macintosh, and Serial Interface Computers

With Voice!

- 64K or 256K RAM. Keyboard or serial upload.
- Wand, CCD, orLaser Scanners
- UPC/EAN, 128, 2of5, Code 39
- **Optional voice messages tell operator what to do at specified errors and at data entry steps. Messages are pre-recorded by microphone and broadcast thru built-in speaker.**
- Complete 64K Unit with Steel Wand – **$799**

Ordering is Easy!

- **Same Day Shipping • USA Made**
- **Free UPS Blue in USA**
- **Qualified P.O.'s Accepted**
- **Free "800" Support**
- **30 Day Money Back Guarantee**

Call 408-458-9938 or Call Toll Free

800-345-4220

In Europe call information for Toll Free numbers to our Swiss Office or call 71 87 51 15 in Schweiz.

---

variant microsystems
...Where Quality Counts

BAR CODE AND MAGNETIC CARD ACCEPTED SIMULTANEOUSLY

- For XT/AT, PS/2, 286/386/486 PCs, RS-232/Scancode terminals
- DOS/UNIX/PC-MOS compatible
- 10 year warranty on readers
- 30 day moneyback guarantee

Made in USA

CCD with Decoder & Bar Code Printing Software - $485

46560 Fremont Blvd., #105
Fremont, CA 94538
(510)440-2870 • (510)623-1372 (FAX)
(800)666-4BAR (Orders)

MasterCard VISA AMERICAN EXPRESS

CIRCLE 468 ON READER SERVICE CARD

DISK COPY SERVICE

DUPLICATION FROM $.49

HIGHEST QUALITY MEDIA

From $.49 (5.25") and $.80 (3.50")

- All Diskette Formats
- Custom Labels
- Diskette Mailers / Accessories
- Assembly Services
- Generous Volume Discounts

FORMATTED DISKETTES

FORMATTED	QTY 250	BLANK
$.69	3.50" DS/HD	**$.59**
$.56	3.50" DS/DD	**$.49**

- **FREE FORMATTING** on First Order
- **BASF, MEMOREX, VERBATIM**
- **SONY AVAILABLE** for Small Upcharge
- **COLORED MEDIA** Please Add $.05

800-255-3142
Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

COMPUTER INSURANCE

SAFEWARE

Insures your computer. Full replacement of hardware, media & purchased software. As low as $49 yearly. Covers fire, power surge, and accidental damage. Now available in Ontario. Call for immediate coverage or information

1-800-800-1492

SAFEWARE
The Insurance Agency Inc
2929 N. High St., PO Box 02211
Columbus, OH 43202
Local (614) 262-0559

DATA RECOVERY

Hard Drive Crash?!

We have rescued data from drives that won't spin, bad track 0, bad FAT tables, flood/fire damage and other catastrophic failures. Used by IBM, Faralon, Amoco, Mobil and others. Consideration given to dealers and consultants. Small evaluation fee, fast turnaround and reasonable recovery rates.

TOTAL RECALL™
The Data Recovery Experts™
318 Reese Street,
Ridgecrest, CA 93555
800/743-0594 • 619/384-4005 Fax

DISK COPY SERVICE

MIRROR IMAGES
RIBBON IMAGES
DISKETTE DUPLICATION

Superior duplication . . .
Your reputation depends on it.
Our reputation assures you of it.

- ALL DISK FORMATS
- FAST 24 HOUR TURNAROUND
- EXCEPTIONAL PRICING AND SERVICE

Call for more information and quotation.

800-322-0577
BOWLING GREEN, OHIO

SUPPLIES

QUALITY TONER CARTRIDGES

- New • Remanufactured • Recycled
- Apple, Canon, HP, IBM, etc.
- Prices Starting At $25
- We Buy Empties – Call

SAVE THE EARTH

Quality Recharge Co.
3965 Park Ave.
St. Louis, MO 63110

FREE BROCHURE
1-800-238-2333
314-865-0929

CIRCLE 501 ON READER SERVICE CARD

FACT: 54% of PC WORLD'S managers purchased the advertised product within a short time of seeing the ad.

SUPPLIES

TONER! New & Remanufactured toner cartridges & other supplies for laser printers!

RIBBONS! New and Reloaded ribbon cartridges for impact printers!

ink jet refills!

- RECYCLE & SAVE up to 70% on printer supplies!
- Friendly service & great products for over 20 years.

CALL FOR FREE SUPPLIES CATALOG

800-426-8196
We buy empty toner cartridges

WILLOW

CIRCLE 492 ON READER SERVICE CARD

Software

BUSINESS APPLICATIONS

UPS Shipping Software

Direct interface to Macola, DacEasy, RealWorld, Great Plains and Platinum. Used as TSR can work with almost any software. Also works great stand-alone. Computes zone & charges. Prints Manifests, COD tags, shipping labels, etc. Optional 100WT, GSV, RPS, USPS, FedEx, scale intf. Guaranteed UPS acceptance. 60-Day money back.

V-Technologies
P.O. Box 6261
Wolcott, CT 06716
(203) 879-6960
Fax (203) 879-6962

CHURCH APPLICATIONS

Bible Book Store on Disk

Full featured, fast and friendly Bible Study Software. As the leader in Bible Study Software since 1981 we have continued to listen to our customers and provide them with the tools they need. We offer a complete line of Windows and DOS Bible Study Tools. Call for **free Catalog.**

Bible Research Systems
2013 Wells Branch Pkwy #304
Austin TX 78728
800/423-1228•512/251-7641

PC WORLD'S PC-Proficient Managers are involved throughout the buying process. They have the budget authority to sign off on final purchases and the knowledge necessary to recommend and evaluate brands

Call The PC WORLD Classified Department Now 1-800-262-9885 For More Details

CHURCH APPLICATIONS

Church Management Systems

Expect the best!

- *Outstanding Reporting*
- *Superior Support*
- *Integrated Modules*
- *Over 1500 Users*
- *Free Preview Disk*

1-800-247-8044

TSL - 3300 Bass Lake Road, -#304
Brooklyn Center, MN 55429
FAX 612-566-2250

CIRCLE 415 ON READER SERVICE CARD

Church Partner

Written by Computer professionals involved in church management. Skilled users love its power, depth and flexibility. Novices love its ease of use. 13 optional modules with support and upgrade. For IBM compatible and LANs. Object oriented graphic user interface, pop-up menus, windows mouse compatibility and more.

Software by Summit Systems Inc.
Suite 121, 16 Berry Hill Road
Columbia, SC 29210 USA
803/798-9749, 800/228-5857
Fax: 803/731-0349

CHURCH SOFTWARE

Discover for yourself why more churches are choosing **PowerChurch Plus.®**
Try out the leading membership and accounting package.
Call today for your **FREE** full-working **DEMO.**

F1 SOFTWARE, 208 Ridgefield Drive, Asheville, NC 28806
800/486-1800

CIRCLE 482 ON READER SERVICE CARD

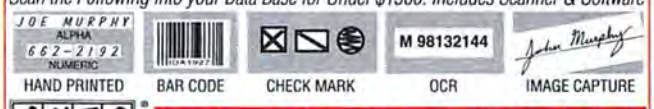
FACT: PC WORLD subscribers who are involved in the buying process buy for an average of 86 PCs each.

DATA ENTRY

Automate Your Data Entry

Manual Data Entry of Information Gathered from Forms is Expensive, Tedious, Error Prone and Could Lead to Carpal Tunnel Problems

Scan the Following into your Data Base for Under $1500. Includes Scanner & Software



HAND PRINTED | BAR CODE | CHECK MARK | OCR | IMAGE CAPTURE

AUTO DATA SYSTEMS
A Unit of Electro-Sensors, Inc

For More Information – CALL TOLL FREE

800/662-2192 FAX: 612/941-7312

10365 West 70th Street • Eden Prairie, MN • 55344-3446

CIRCLE 442 ON READER SERVICE CARD

Viking Data Entry

Professional Quality Software

- Used by U. S. Census
- Advanced Validation
- Sequential/ISAM files
- MS/DOS, UNIX, XENIX, VMS, AIX
- Technical Support
- Re-key verify

Viking Software Services
4808 E. 67th St. Ste. 100
Tulsa, OK 74136
918/491-6144
FAX: 918/494-2701
800/324-0595

THE DATA ENTRY EMULATOR™

Full featured, heads-down entry, with two-pass verification, batch control, output record reformat, operator stats, edit language, customizable menus, help text. Free technical support.

PC from $395
Also for LAN's, IBM AS/400™, IBM S/36

FREE trial

206/776-6443
800/356-0203

COMPUTER KEYES
21929 Makah Rd.
Woodway, WA 98020

DATA ENTRY

Replace dedicated *data input* systems
Front-end mainframe applications

KeyEntry III

- LAN or stand-alone environments
- ScreenPainter and MenuManager included
- Batch Control System and Reformat utility
- Spanish, German, and French versions
- Outstanding customer support
- Thousands of users worldwide
- OS/2 version

800-533-6879

FREE DEMO DISK AVAILABLE TO QUALIFIED COMPANIES!

SCS
SOUTHERN COMPUTER SYSTEMS, INC.
(205) 251-2985 ■ FAX (205) 322-4851
In UK: SCS Europe, Ltd 0753-36550/ FAX 0753 36765

ENTERTAINMENT

AI Horse Racing System

Turn your PC into an "expert" Handicapper! The Horse Expert AI system handicaps races with incredible accuracy. The expert's knowledge base of race tracks and breeding allows accurate forecasts of: Dirt, Slop, Maidens, even 1st Time Starters! Sold nationally at $295. Special PC World Introductory price of $169. "The Einstein of Handicapping... sheer genius"-LG,N.Y

.

IMSI,The Horse Expert
PO Box 14013, Northeast Plaza
Sarasota, Florida 34278
M/C, VISA, AMEX, accepted
Fax Credit Card Orders: 813-377-8475

FINANCIAL

Loan-Amortization

EXEC-AMORT. Replace Desktop Financial Calculators, Avoid Inaccuracies, Quit Using Your Spreadsheet, Store Loans to Disk, Solve for PV, FV, I, PMT, N. Easy to read amortization reports, fixed & ARM's, APR's per Reg Z, Points & Fees, Balloons, irregular & skipped payments. $149.95 US + $5 s/h. Int'l add $25

ELECTROSONICS
36380 Garfield, Suite 1
Fraser, MI 48026 USA
800-858-8448, 313-791-3010 fax
Int'l phone: 313-791-0770

MortGauge for Windows

SAVE THOUSANDS OF DOLLARS! using this powerful mortgage/loan analysis software. Use multiple windows to easily compare terms, payments, periods,rates,paydowns and interest paid. Save or print any number of mortgages including payment schedule. Evaluate renewal options. $69 US+$5 s/h. 30 day money back. V/MC/Cheque
CONSULNET COMPUTING INC.
6689 Orchard Lake Road,Suite 318
W. Bloomfield, MI, 48322, USA
1-800-361-9527, • (416)-441-0363
FAX: (416)-449-1985

EDUCATION

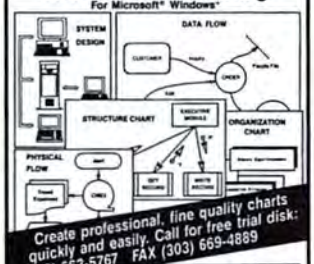
BS & MS
In Computer Sciences

- ALL COURSES BY CORRESPONDENCE.
- Increase your earning power.
- Join students from leading computer companies.
- Most courses fully interactive.

AMERICAN INSTITUTE of COMPUTER SCIENCES
For free information write 2101-WO Magnolia Ave. Suite 200 B'ham, AL 35205 USA
or call 1-800-767-2427

FLOW CHARTING

RFFlow
Professional Flowcharting
For Microsoft® Windows™



Create professional, fine quality charts quickly and easily. Call for free trial disk: (303) 663-5767 FAX (303) 669-4889

$129.00
RFF ELECTRONICS
1053 Banyan Court, Loveland, CO 80538

FOREIGN

FOREIGN LANGUAGE SOFTWARE

Chinese, Japanese & over 80 other languages Font makers, Translators, Tutorials, Developer's tools and related software. Japanese & Chinese speaking staff. 24 hour info/fax-on-demand service for sample & info. We have what you need in stock. Call for catalog.

.

CHARACTER LANGUAGE RESOURCES
2130 Sawtelle Blvd., Suite 300B,
L.A. CA 90025
PH: 310-996-2300/ 800-569-2099
FX: 310-996-2303

GRAPHICS

IMAGES WITH Impact! FOR WINDOWS

Your presentations and documents will come alive with over 1,000 high-impact WMF graphics. Includes: business, cartoons, food, healthcare, nature, people, sports, presentation helpers, travel and more! Works with Windows and DOS. Available on disk and CD-ROM.

Plus a FREE t-shirt and 20 TrueType fonts in each box!

1-800-456-0234 ext. 42
Call for a retailer near you.

CIRCLE 419 ON READER SERVICE CARD

MAINTENANCE MANAGEMENT

Maintenance & Inspection

An integrated maintenance management system, including parts inventory, with clients in Fortune 500 companies, utilities, hospitals, schools, manufacturing & service industries, etc. The online system provides operational, planning & analytical reports, such as work orders, schedules, skill & inventory requirements, budget reports & reports that summarize history of work performed.
Penguin Computer Consultants
PO Box 20485
San Jose, CA 95160
408/997-7703, FAX: 408/927-0570
800/521-0545

MEDICAL

Lytec Medical

Advanced practice management for both DOS and WINDOWS. According to PC World: "This program is packed but costs only a tenth of what its competitors charge... The key features are all here." Billing and accounts receivable, practice management, personal finance,scheduling, graphics, multi-user, multi-provider.

Lytec Systems, Inc.
7050 Union Park Center
Suite 390
Midvale, UT 84047
Tel: 1-800-735-1991

MAIL ORDER

The Mail Order Wizard

Complete management system for a catalog, inbound telemarketing, or mail order company. Order processing, inventory mgt, ad forecasting, sales/banking, list mgt, modem charge approval, EDC, UPS manifest w/scale interface. Single and Multi User Systems. Inbound/Outbound Editor's choice.
Haven Corporation
1227 Dodge Ave., Dept. W93
Evanston, IL 60202
800/676-0098, 708/869-3434

Mail Order Manager (M.O.M.)™

America's most popular, complete, and affordable solution for the mail order business - order entry/review, credit card processing with draft capture, UPS manifesting, profit analysis, accounting, telemarketing, list management. Clipper compiled, dBase III + files. Single and Multi-user versions. Find out why more people buy MOM after comparing! Call for demo kit.
Dydacomp Development Corporation
150 River Road, Suite N1, Dept. PCW
Montville, NJ 07045
(800)858-DMOM (201) 335-1256

MUSIC

SongWright V

MUSIC PROCESSOR prints professional sheet music, songs, scores with text, chords, dynamics. Compose, edit, record, play, transcribe, copy, transpose, extract import, publish - all in standard notation. Symbol editor/librarian. PC, MIDI/AdLib, or SMF entry & playback. Matrix/laser/Deskjet printers. $119.95+$5 s/h. Free sample output.
SongWright Software
7 Loudoun Street, S.E. Ste 5B
Leesburg, VA 22075
1-800-877-8070, 703-777-7232j2

PUBLIC DOMAIN/ SHAREWARE

The SOFTWARE LABS

WORLD'S LARGEST SHAREWARE DISTRIBUTOR
Selected by IBM as a supplier for software testing.
See why IBM chose our professionally tested virus-free library.
LABORATORY CERTIFIED VIRUS FREE 100% GUARANTEED

CALL TOLL FREE OR WRITE FOR OUR FAMOUS 80-PAGE CATALOG WITH EXCLUSIVE 12 BONUS DISK OFFER.
100 CORPORATE POINTE, SUITE 195 CULVER CITY, CA 90230
800-569-7900
FAX: 310-410-2044

CIRCLE 402 ON READER SERVICE CARD

99¢ SHAREWARE SPECTACULAR

FREE CATALOG
OVER 600 PROGRAMS
NO Minimums, NO Gimmicks, NO Clubs
Business, Windows, Games, Education
24-Hour, Toll Free Ordering
SHAREWARE EXPLOSION CD-ROM – $49
Over 5,000 Programs – Menu Driven
We Carry a Full Line of Graphics CD-ROMS
S Software, 2880 Bergey Rd., Dept. 600BT
Hatfield, PA 19440 • (215) 997-2470

CIRCLE 405 ON READER SERVICE CARD

FREE
IBM & MAC SOFTWARE
CATALOG
32 Pages! ASP Member

SOFTSHOPPE
P.O. Box 247
ARTESIA, CA 90701
Tel: (310) 802-1523
FAX: (310) 802-1494

Toll-Free—24 Hrs.
1-800-851-8089

CIRCLE 512 ON READER SERVICE CARD

ON-LINE SERVICE

Best Files in the U S A!

Channel 1®

Over 3,000,000 calls!

■ 200 new Shareware programs every day ■ Music Graphics Business/Finance Windows Adult ■ INTERNET E-Mail and 2500+ Newsgroups ■ No obligation Special FREE downloads Area

8-N-1 **617-354-3230** 2400 and v.32/v.32 bis

CIRCLE 424 ON READER SERVICE CARD

ULTIMATE MODEM

Call from home or office!

•The Ultimate BBS•

FREE

- Lively Chat
- 100,000 Shareware & GIF's, Windows and DOS files
- USA Today Online
- FREE ACCESS
- Unlimited Downloads
- 14.4k on all 60 Lines
- New GIF's posted daily by our photographers

1-217-792-3663

Customer Support Voice Line 415-281-4429

CIRCLE 445 ON READER SERVICE CARD

FREE Online Service

Global Gallery offers online services for **FREE.** Connect with Internet, MajorNET and nightly national chatting via interLink. Over 5.6 gigs of shareware. Access USA Today, New York stock exchange, dozens of single and multi-player games and more!

Just call our fast 14.4 baud modem **715-445-6000**

Voice Mail 608-849-1466

FACT: 84% of PC WORLD'S employed subscribers are managers

FREE GIFS

Download some of the most Entertaining Images from our On-Line Magazine - FREE !

LACE is an On-Line Magazine that offers you:

- ABSOLUTELY the best Color Photographs and Color Scans in the WORLD & not available on any other BBS !
- SWIMWEAR, LINGERIE & FIGURE MODELS who create images that stir your imagination.
- VIDEO for Window's Files, the latest and hottest Microsoft Product. Play these Video Movies on your Computer and watch our models come to life on your computer screen.
- LOCAL ACCESS #'s for over 800 cities in the U.S.
- HIGH SPEED access available. (14.4k down to 1200 baud)
- AND . . . RATED #1 BY OUR USERS ! !

Set your Modem to 8-N-1 and your terminal to ANSI Graphics

(818) 709 - 4275

Questions? Call our voice line at (818) 709-3795.

LACE

the on-line magazine

Limited Offer

CIRCLE 447 ON READER SERVICE CARD

RESTAURANT/POINT OF SALE

ROUNDTABLE

One West Loop South Suite 801 Houston, Tx 77027

RoundTable RMS Restaurant POS

Controls Food and Labor Costs, Security, Point Of Sale, Timeclock, Network Option. Supports Cash Drawer, Receipt & Kitchen Printers. Full Reporting. IBM Compatible

(800)324-2388 (713)622-9841

$495 Easy Restaurant Software $495

CIRCLE 435 ON READER SERVICE CARD

REAL ESTATE

Property Management

Comprehensive software for managing residential, commercial, condos & more. Three versions: Basic PM for owner/manager-$495, Deluxe PM for professional management-$1,195, Multi-User with Novell network compatibility-$2,395. Includes check writing, recurring expenses, G/L, management reporting.

Yardi Systems, Inc.
819 Reddick Street
Santa Barbara, CA 93103
805/966-3666

Property Mgt Plus/94

New version which looks up tenants & posts rent by Tenant Name Prints. Bank Deposit Slips, Rent Statements, & Automatic Checks. Reports. Late Rents, Vacancies & Expired Leases. Posts Management Fees, Pays Owners & does 1099s. Saves up to 80% of accounting time & is the EASIEST system to use! Multi-User version available.

Realty Software
330 21st Street
Manhattan Beach, CA 90266
310/545-6165 or 801/649-6149

Property Management

Rental-Ease. Tracks tenants, income and expense, repairs and maintenance and much more. Guaranteed to be the easiest and fastest property management program available at any price. Others claim ease of use, see our demo and decide for yourself.

Versions for owners, professionals, networks. $395 to $1295. Free brochure, demo $10

Strategic Office Systems
688 North 500 West #61
Mt. Pleasant, UT 84647
800/942-6784 or 801/462-2130

FACT: 82% of PC WORLD subscribers have advised an average of 5 people each month on PC purchases.

STATISTICS

NCSS 5.x Series - $125

Easy-to-use menus & spread sheet. Multiple regression. T-tests. ANOVA (up to 10 factors, rep. measures, covariance). Forcasting, Factor, cluster, & discriminant analysis. Nonparametrics. Cross Tabulation. Graphics: histograms, box, scatter, etc. Reads ASCII/LOTUS. Many new add-on modules.

NCSS
329 North 1000 East
Kaysville, UT 84037
Phone: 801-546-0445
Fax: 801-546-3907

SURVEYS

NEW StatPac Gold IV

Professional's choice for survey & marketing research. Covers questionnaire design, sampling, CRT & telephone interviewing, basic analyses & presentation quality graphics. Includes frequencies, tabs, banners, descriptives, t-tests, verbatim coding, etc. Advanced statistics available. Free brochure.

StatPac Inc.
4532 France Ave. South
Minneapolis, MN 55410
TEL: (612) 925-0159
FAX: (612) 925-0851

UTILITIES

REMOVE HARDWARE LOCKS

Protect your investment!

Don't wait for your lock to get lost, stolen or fail and render your program useless costing you $$$$

Our SAFEKEY'S are guaranteed to unlock the following programs:

MaxRoute	Pads 2000	3D-Studio
MasterCam	CadKey	Topas
MicroStation	Rio	& others

From $250 plus S&H

VISA (609) 390-2799

Fax: (609) 390-3750 MasterCard

IMAGINE THAT

One Evergreen, Seaville, NJ 08230

CIRCLE 486 ON READER SERVICE CARD

The Garner File Analyst

Reformat,analyze,verify, scan, length check, formatted dumps, search & replace, diskettes, split, translate, rearrange and more. ASCII,EBCDIC,xBase,binary,delimited,text & much more. 19 functions for fields, records & files. Fill in the blanks and run. View changes on-the-fly. Single keystroke finds files. No flipping to DOS! Summary reports. Help before,during & after every run. *(The ultimate File analyzer & Reformatter.)* $119.50

Ralph Garner Associates, Inc.
99 Madison Avenue
New York, NY 10016
212-779-7667

CIRCLE 452 ON READER SERVICE CARD

MORE PROFIT! MORE SALES! MORE CUSTOMERS!

Save Time, Reduce Theft, Speed Checkout with

The General Store Retail Management System

Since 1983, **The General Store** has been the system of choice by thousands of retail and chain stores nationwide. Known for its ease of use, flexibility, and lightning speed, **The General Store** is ideal for most retail environments. At $149.95, **The General Store** starter kit offers over 250 of the most desired point of sale features. A clerk can learn to use it in minutes. Your customers are processed in seconds.

THE GENERAL STORE SOFTWARE

PC AMERICA
HARDWARE SOLUTIONS

Flexible Enough for Any Business

apparel/clothing/shoe
appliance
art gallery
automotive/tire
beauty salon/supply
bicycle/motorcycle
book
bridal and tuxedo
card shop/gift shop
computer
convenience/fast food
dry cleaner
eyeglass
florist
furniture
gas station
sporting goods/golf/gun
grocery/bakery
hardware/locksmith
health/fitness center
janitorial supply
lawn and garden
jewelry
liquor
mail order
marine supply
music/record and tape
nail salon
office supply/stationery
pet
pharmacy
photography
plumbing & heating
specialty stores
toy /hobby
sports cards/uniform
...and YOUR STORE!

Increase your profits by more than 25%

Computerization pays for itself, saving you thousands of dollars, giving you peace of mind, and making the best use of your time. The General Store, with over 250 of the most desired point of sale features, will help you leapfrog past your competition by controlling costs, reducing errors and increasing efficiency.

- **Quicker Checkout**-barcode scanning (50% faster than a cash register), instantaneous no wait receipt printing system, automatic credit card verification, split tender, product lookup by any word, new items added at POS
- **Increased Accuracy**-100% accurate built-in barcode scanning and printing, instant price lookup, price quotes, serial number tracking, multiple pricing levels, multi-unit pricing (i.e. 3/$1.00)
- **Reduced Theft**-cash register reconciliation, salesperson tracking, password protection, pole display sale verification, accurate inventory tracking
- **Cost Reductions**-real time inventory control, dynamic update of item sales and inventory data, reorder point alarms, extensive reporting capabilities, multi vendor P.O. selection (5 vendors per item)
- **Better Business Decisions**-detailed reports and financial statements showing the status of your business, charge account credit limit checking, parts explosion for kits tracks every inventory item, built-in general ledger, accounts receivable and accounts payable
- **Better Customer Service**-customer purchase history, complete layaway, mail list management, instant customer lookup, multiple price level support by category of customer
- **Unique Features**-powerful size/ color matrix for clothing and shoe stores, electronic scale compatibility, convenience store/gas station pump compatible, supports 99 work stations per store, multi-store ready, FREE file conversions from 32 other POS systems

FREE!
Take a FREE 30-day General Store Test Drive
(call now for details)

PC AMERICA PRICE LIST

Using another P.O.S. system? Call for **SPECIAL COMPETITIVE UPGRADE PRICE!!!!**

DEALERS WANTED!
Join our new dealer program. It's **FREE.** It's the fastest way to make money...**AND** we make it **EASY.** Call now for details.

The General Store Professional Edition (single user, multisite ready)	**$995.00**
The General Store Network Edition (multisite ready)	**$1,495.95**
The General Store Starter Kit (abridged version)	**$149.95**
Cash Drawer	~~$199.00~~*
Citizen Receipt Printer	~~$299.95~~*
Pole Display	~~$299.00~~*
CCD Bar Code Reader	~~$399.00~~*
Laser Bar Code Scanner	~~$429.00~~*

*** Call for Competitive Prices**

1-800-PC-AMERICA

Call Toll Free 1-800-722-6374
In Canada Call SunRise Computer: 416-372-3977
Phone: 914-426-2600
PC America
25 South Main Street
Spring Valley, NY 10977
Fax: 914-426-0140

Circle 151 on reader service card

PANASONIC

KX-P4400 Laser ..... LIST ~~$649.95~~
KX-P4430 Laser $619.95
KX-P4440 Laser $1059.95
KX-P4455 Laser $1639.95
KX-P5400 Laser ..... LIST ~~$999.95~~
KX-P5410 Laser ..... NEW

Attention Educational Institutions
If you're not Currently using our educational program, please call one of our representatives for details.

PANASONIC

1150 ..... $124.95
2180 ..... $149.95
2180 Color ... $185.95
2023 ..... $185.95
2123 ..... $219.95
2123 Color ... $255.95
2124 ..... $279.95
2124 Color ... $315.95
2624 ..... $379.95
1624 ..... $359.95
1654 ..... $569.95

CITIZEN

GSX-190 ..... $159.95
GSX-190 Color $199.95
GSX-220 ..... $179.95
GSX-230 ..... $179.95*
GSX-230 Color $215.95*
GSX-240 ..... $239.95*
GSX-240 Color $275.95*
GSX-145 ..... $349.95
Laser Pro 6000 $689.95
*After $40 Rebate Rebate ends 1/31/94

STAR

NX-1001 ..... $129.95
NX-1040 Color $149.95
NX-2430 ..... $194.95
NX-2450 Color $229.95
NX-2480 Color $259.95

Seagate Hard Drives

SIZE	SPEED	MODEL	TYPE	PRICE
3½" 1 Inch High:				
42MB	28MS	ST-351AX	IDE/AT	$104.95*
130MB	16MS	ST-3144A	IDE/AT	$158.95*
251MB	16MS	ST-3290A	IDE/AT	$217.95
341MB	12MS	ST-3390A	IDE/AT	$275.95
3½" Half Heights:				
1050MB	10.5MS	ST-11200	Fast SCSI-2	$859.95

*Quantities Limited

WESTERN DIGITAL Hard Drives

SIZE	MODEL	PRICE
212MB	WDAC 1210	$198.95
256MB	WDAC 2250	$217.95
341MB	WDAC 2340	$274.95
425MB	WDAC 2420	$339.95
540MB	WDAC 2540	$499.95

All Western Digital drives are IDE/AT format

HOURS

Sales: Mon. - Fri. 9 - 9 EST.
Sat. 10 - 6 EST.
800-233-8760 or 717-494-1030
Fax: 717-494-1441
Customer Service: Mon. - Fri. 9 - 5 EST.
717-494-1670

POLICY

Why shop at Lyco Computer? Lyco Computer offers quality name brand computer products at prices 30% to 50% below retail. If you do not see the product you want advertised, call Lyco Marketing toll free. ***How do I know I will get the product I need?*** Our marketing staff receives continuous formal training by our manufacturers. Though our strict guarantee on providing only new merchandise prohibits free trial periods and a guarantee on compatibility, a wealth of knowledge is available to our customers. As thousands of people every week capitalize on our savings and services, we hope you too, will make Lyco Computer your first choice. ***What about warranty or service?*** Our Customer Service Department is available at (717) 494-1670 to assist you. We back all of our manufacturer's stated warranty terms. Before returning any item that appears to be defective, we ask that you call our Customer Service Department. ***Will you rush an item to me?*** We offer next day air, two day air, standard UPS, and postal international shipping services. Temporary shortages are normally filled within 10 days. ***How do I order?*** We have always accepted C.O.D. orders through UPS. Prepaid cash orders over $50 are shipped freight-free in continental U.S. For orders under $50, please add $3 for freight. Personal & company checks require a 4 week clearing period. Visa, Master Card, American Express and Discover Card orders are accepted for your convenience. Purchase orders are accepted from Educational Institutions. We charge sales tax on deliveries in PA. For APO, FPO, and international orders, add $5 plus 3% for priority mail. Advertised prices and availability are subject to change. Send your order to Lyco Computer, P.O. Box 5088, Jersey Shore, PA, 17740. Or, call 1-800-233-8760 or (717) 494-1030. Return restrictions apply. Not responsible for typographical errors.

EPSON ActionLaser 1500
- 6 PPM
- 1MB
- 14 fonts
- 2-Year warranty

$639.95

OKIDATA 400E LED
- 4 PPM
- 44 fonts
- 300 X 300 dpi
- 512K RAM
- 5-Year ★printhead warranty

$479.95★ *Quantities Limited

$40 CITIZEN REBATE

CITIZEN GSX-230
- 270 CPS draft
- 90 CPS LQ
- 2-Year warranty

$179.95★ *After $40 Rebate Rebate ends 1/31/94

EPSON LQ-570+
- 24-Pin
- 337 CPS draft
- 14 fonts
- Enhanced graphics
- 2-Year warranty

$238.95

Star SJ-144 Color
- Laser quality
- Up to 612 CPS
- 23 fonts
- Heat fusion process

$459.95

Panasonic KX-P2124
- 320 CPS draft
- 106 CPS LQ
- Low noise
- 2-Year warranty

$279.95
WITH COLOR...$315.95

Seagate ST-3144A
130 MB
IDE/AT
$158.95★
*Quantities Limited

Maxtor 7245A
245 MB
IDE/AT
$217.95

WESTERN DIGITAL 2340
341 MB
IDE/AT
$274.95

Colorado Jumbo 250
Tape Back-Up
250 MB
$159.95

Pro Deluxe Sound Card
- Stereo digital analog mixer
- CD-ROM interface
- 1-Year warranty/

$109.95

GVC FM 144/144HV Fax Modem
- Internal 14400 baud send/receive MNP5 data compression
- 5-year warranty

$139.95

CREATIVE LABS
Sound Blaster sound cards

Deluxe $69.95
Pro Deluxe ... $109.95
16 Basic $129.95
16 MCD $149.95
16 MCD ASP . $179.95
16 SCSI $159.95
16 SCSI ASP . $199.95

MEDIA VISION
Sound Cards

Pro Audio
16 w/SCSI .. $165.95
Pro Audio Studio
16 w/SCSI .. $209.95

GVC
Modems

GM 24I 2400 .. $25.95
FM 9648/24H .. $42.95
FM 144/144HV $139.95
FM 144/144V . $159.95

If you don't see your product, please call.

Laser Printers

OKIDATA

OKI 400E LED $479.95*
OKI 410E LED $644.95
OKI 810 LED $839.95
OKI 830+ LED $1045.95
OKI 850 LED $999.95

**Quantities Limited*

Dot Matrix Printers

EPSON

3260 Color .. $209.95
LQ-570+ $238.95
LQ-1070+ ... $359.95
FX-1170 ..... $349.95
LQ-870 ..... $439.95
LQ-1170 ..... $598.95
LQ-2550 ..... $899.95
Stylus 300 ... $225.95
Stylus 800 ... $274.95

Mannessmann Tally

MT151/9 .... $495.95
MT360 2T .. $1999.95
MT691 ..... $6999.95

OKIDATA

380 ..... $204.95
184 I Turbo .. $210.95
320I $279.95*
520/521 $348.95/455.95
321 ..... $415.95
395 + ... $945.95
395 C $999.95
3410 ..... $1179.95
590 Post-Net/ Bar Code .. $415.95
591 Post-Net/ Bar Code .. $565.95

*With purchase of back-up ribbon $9.95

Hard Drives

Maxtor

SIZE	SPEED	MODEL	TYPE	PRICE
3½" 1 Inch High:				
213MB	15MS	7213A	IDE/AT	$198.95
245MB	15MS	7245A	IDE/AT	$217.95
345MB	14MS	7345A	IDE/AT	$275.95
540MB	8.5MS	540SL	SCSI-2	$599.95
540MB	8.5MS	540A	IDE/AT	$599.95

Tape Back-Ups

COLORADO

Jumbo 250 ..... $159.95
Trakker 250 ..... $309.95
DC 2120 blank tape cartridges ... $18.95
PT-25 2 Gigabyte $929.95
PT-50 Gigabyte $1485.95

CONNER

C250MQ 2-Year Warranty $139.95
C250MQP Parallel Port Ext $279.95

IBM Computers

Occupation & Saftey & Health Administration Regulations for LABOR

PS/Value Point VESA Systems

486 SX/25 120MB DOS/WIND VESA .. $1269.95
486 SX/25 245MB DOS/WIND VESA .. $1399.95
486 SX/33 120MB DOS/WIND VESA .. $1399.95
486 SX/33 340MB DOS/WIND VESA .. $1699.95
486 DX/33 120MB DOS/WIND VESA .. $1599.95
486 DX/33 340MB DOS/WIND VESA .. $1899.95
486 DX2/66 245MB DOS/WIND VESA . $2125.95
486 DX2/66 340MB DOS/WIND VESA . $2269.95

*OS2 Versions Available - $CALL
*Space Saver and Tower Versions Available - $CALL

Lyco Computer 800-233-8760

P.O. Box 5088 Jersey Shore, PA 17740
Customer Service (717)-494-1670
(717)-494-1030 Fax: (717)-494-1441

Circle 126 on reader service card

USA Flex... Name

Special Purchase!

All Models Include 1 Year Compaq Factory Warranty (Carry-In)

"Factory-Reconditioned"
COMPAQ CONTURA NOTEBOOKS
$1049
Prices Start at

Choose From over 15 Models including...

Contura 386SL/20 M84/w+	$1099
Contura 386SL/25 M120/w+	$1299
Contura 4/25 M120/w+	$1699
Contura 4/25C M120/w+	$2399

(Contura 4/25C Includes FAX Modem)

COMPAQ

All Compaq Systems come with 1.44MB Diskette Drive and 3 Year Limited Warranty.

Contura 4/25 Mono 120MB/209MB	$1879/$2149
Contura 4/25 Color 120MB/209MB	$2599/$2879
LTE Lite 4/25 120MB/209MB	$2039/$2319
LTE Lite 4/25E 120MB/209MB	$2759/$3049
LTE Lite 4/33C 120MB/209MB	CALL
PROLINE4/25s 120MB/209MB	$999/$1089
PROLINEA 4/33s 120MB/240MB/340MB	$1149/$1279/$1379
PROLINEA 4/50 120MB/240MB/340MB	$1699/$1889/$2029
PROLINEA 4/66 120MB/240MB/340MB	$1889/$2079/$2229
DESKPRO 4/25is 240MB	$1699
DESKPRO 4/25is 240MB (With Pentium Upgrade Technology)	$1749
DESKPRO 4/33is 340MB	$1999
DESKPRO 4/33i 240MB (With Pentium Upgrade Technology)	$2029
DESKPRO 4/66i 240MB	$2399
DESKPRO 486/33M (without HD)	$1879
DESKPRO 486/33M 340MB	$2789
DESKPRO 50M 120MB/340MB	$2499/$3169

TEXAS INSTRUMENTS

As Low As...
$1849

TravelMate 4000E WinSX/25 Mono	$1849
TravelMate 4000 WinDX/25 Mono 120MB HD/200MB HD	$1999/$2179
TravelMate Win4000 DX2/50 Mono 120MB HD/200MB HD	$2529/$2699
TravelMate 4000E WinSX/25 Advanced Passive Color 486SX 25MHz, 120MB HD	$2099
TravelMate 4000 WinDX2/40 Color 486DX2 40MHz, 200MB HD	$2959
TravelMate 4000E WinDX2/50 Dual Scan Color 486DX2 50MHz, 200MB HD	$3219
TravelMate 4000E WinDX2/50 Active Matrix Color 486DX2 50MHz, 200MB HD	$3799

HEWLETT PACKARD

Authorized Dealer

Introducing HP DeskJet 310 & HP DeskWriter 310 Inkjet Printers!

COLOR Capable Kit

Only... **$299**

Shown with optional 60 sheet cut sheet feeder.

- Full-featured printing for PC or MAC - excellent print quality, fast and flexible media handling
- Convenient portable features-small, lightweight and easy to use

TOSHIBA

NEW *Portege T3400CT*

Only... **$3379**

- 486SX/33 3.3V
- 4.1 pounds
- Active Matrix
- 120MB Hard Drive
- 4 MB RAM (Exp. to 20MB).

T1900/T1900 120MB/200MB	$1699/$1949
T1900C 120MB/200MB	$2329/$2569
T1950 120MB/200MB	$2059/$2299
T1950CS 120MB/200 MB	$2649/$2899
T1950CT 120MB/200 MB/320MB	$2799/$2969/$3299
T3400/T3400CT 120MB	$2199/$3379
T4600 Mono120MB/200MB	$2529/$2659
T4600C Color 120MB/200MB/340MB	$3899/$4159/$4579
T4700CS 200MB/320MB	$3899/$4239
T4700CT 200MB/320MB	$4579/$4929
T6600C/CD/CDV	$6399/$6899/$7999

IBM *ThinkPad® 720*

The Power of a Desktop Computer in a Notebook!

As Low As...
$2399
146500-003

486SLC2 50/25MHz processor, 4MB RAM, 16KB int.l cache, 9.5" mono display, 1.9" x 11.7" x 8.3". 6.5 lbs.

120MB Hard Drive *146500-003*	$2399
160MB Hard Drive *146500-004*	$2549

IBM Business Partner — Authorized Advanced Products Dealer

Only monochrome models available.

PRINTERS

IBM® PRINTERS BY LEXMARK™

LaserPrinter 6	$939
LaserPrinter 10	$1119
LaserPrinter 4039 10R	$1349
LaserPrinter 4039 12R	$1699
LaserPrinter 4039 10D	$1849
LaserPrinter 4039 12L	$2449
LaserPrinter 4039 16L	$2749
LaserPrinter 4037 5E	$659
Ink Jet 4076 ExecJet II	$279
PS4079 Color	$2499
2380 Plus/2381 Plus	$309/$439
2390 Plus/2391 Plus	$329/$439

EPSON

LASER PRINTERS

ACTION LASER 1000	$589
ACTION LASER 1500	$659
ACTION LASER 1500-II	$719

DOT MATRIX PRINTERS

LX-810	$169	**LQ-870**	$439
AP 3250	$174	**LQ-1170**	$598
AP 3260	$209	**LQ-2550 Clr.**	$899
LQ-570+	$239	**DFX-5000**	$1299
FX-870	$268	**DFX-8000**	$2199
FX-1170	$349	**Stylus 300**	$234
LQ-1070+	$359	**Stylus 800**	$279

PRINTERS

PANASONIC

LASER PRINTERS

KX-P4400	$539	**KX-P4440**	$1144
KX-P4410	$549	**KX-P5400**	$829
KX-P4430	$639		

DOT MATRIX PRINTERS

KX-P1150	$129	**KX-P1624**	$359
KX-P2180	$164	**KX-P1695**	$369
KX-P2023	$189	**KX-P2624**	$389
KX-P2123	$224	**KX-P1654**	$569
KX-P2124	$294	**KX-P1124I**	$209

NEC

Silentwriter Model 610	$629
Silentwriter 95f/fx	$869/$1099
Silentwriter 97/97fx	$1055/$1269
Silentwriter Model 1097	$1379
NEC Jetmate 1000	$269

TEXAS INSTRUMENTS

microWriter Basic	$519
microWriter PS23	$679
microWriter PS65	$939
microMarc™	$279

CANON

BUBBLE JET PRINTERS

BJ-200* Narrow Carriage	$259*
BJ-230* Wide Carriage	$369*
BJ-800C Color	$1499
BJ-820C Color	$1629
BJC-600 Color	$58
LBP-430	$589

** After $30 Mail-in Rebate Thru 12/31/93*

MONITORS

NEC

Factory Serviced		**14" SVGA**	$409
3FGx	$349	**15"3V**	$509
4FG	$429	**15" 3FGe**	$579
5FG	$1079	**17" 5FGe**	$1049
Special Purchase		**17" 5FGp**	$1359
3D	$359	**21" 6FGp**	$2369
5FG/6FG (OEM models)	$1099/$1999		

SAMSUNG

14" CVL4955	$229
14" SyncMaster 2	$239
14" SyncMaster 3/3n	$269/$299
15" SyncMaster 15C	$449
17" SyncMaster 4 Plus	$619
17" SyncMaster 5C	$899

FLEXVision

14" VGA MONO	$119
14" 1024X768 NI	$265
15" 1280X1024	$429
14" 5439-A	$219
14" 5468	$249
14" 1451 NI	$269
14" CPS 1461LR	$299
15" CPS 1561/1560LR	$369/$379
17" CPS 1760	$716

MAG Innovision

14" LX1450 LG	$319
15" MX15F	$519
17" MX17F	$949

MONITORS

HITACHI SuperScan™

15" 15S	$489
17" Elite 17	$1349
20" 20S	$1389
20" Pro20	$1689
21" Pro21/Elite21	$2199/$2499

SONY

14" CPD-1320	$329
17" CPD-1604S	$949
20" GDM-2036S	$2069

DATA CARTRIDGES

3M *Buy 5 get the 6th cartridge FREE!**

DC2000 40/80MB	$11.95 ea.
DC2120 120/250MB	$15.95 ea.
DC2120 Ximat (QIC-80)	$20.95 ea.
DC2120 Rhomat	$25.45 ea.
DC600A	$16.95 ea.
DC6150 250/500MB	$17.95 ea.
DC6250 250/500MB	$22.95 ea.
DC6525 350/700MB	$27.95 ea.

**1 FREE cartridge per customer thru January.*

TAPE BACK-UP

COLORADO Memrory Systems

Ask about special on tape caddy.

JUMBO 250 Int/Ext.	$179/$269
JUMBO TRAKKER 120MB	$289
JUMBO TRAKKER 250MB	$349
POWERTAPE™	
2GB Int/Ext.	$949/$1089
4GB Int/Ext.	$1489/$1589

TO ORDER, CALL...

USA FLEX

Code # WD0104

471 Brighton Drive, Bloomingdale, IL 60108

1-800-876-5606

Federal Express® Delivery Service Available

No Surcharge On These Credit Cards

Brands for Less!

FLEX VL486DX2-66MHZ

- Genuine Intel486™ DX2 66MHZ
- 128K Ultra-fast "Writeback" Cache Memory
- OverDrive Ready™ Upgradeable with Intel's OverDrive Processors, including future Pentium™ based Models
- 8MB RAM, Maximum 32MB on System Board
- 3.5" (1.44MB) Floppy Drive
- 340MB < 13ms Hard Drive w/ 64K Cache
- SVGA 1024 X 768 FLEXVISION 14" .28 NI Monitor
- 32-Bit VESA Local Bus Video Accelerator Card w/ 1MB Display Memory, 16.7 Million "True Color" Capability, 1280 x 1024i Maximum Res.
- VESA 32-bit Local Bus IDE Controller
- 2 Serial Ports and 1 Parallel Port
- 101 Key Enhanced Keyboard
- Premium Desktop Case w/ Full 200w P.S. and 7 Drive Bays
- MS DOS 6, Windows 3.1 and Genuine Microsoft Mouse

Plus...

- **Mitsumi CD/ROM,**
- **NX Pro Stereo Sound Card,** Speakers, Stereo Sound, Connects directly to CD/ROM
- **A selection of up to 6 CD/ROM Titles** Ask your sales representative for available titles
- **Panasonic 4410 Laser Printer,** 5ppm, 300 dpi, HP compatible (printer cable included)

486DX2-66 MHz System Bundle **$2995**

IBM® PS/ValuePoint™

Authorized Advanced Products Dealer

Starting At...

$1249 *

** System prices include 14" FLEXVISION SVGA .28mm dot pitch, 1024x768 NI Monitor.*

All PS/ValuePoint Systems Feature

- Intel Microprocessors
- 4MB RAM (Exp. to 64 MB)
- VESA Local Bus SVGA video: 640x480, 800x600, 1024x768, 1280x1024
- One 3.5", 1.44MB disk drive
- Basic 101-key keyboard
- 2 serial, 1 parallel, keyboard, mouse
- IBM DOS, MS Windows 3.1
- 1 Year Onsite Warranty
- Around-the-clock IBM HelpWare® Support

USA FLex offers a full line of systems that can be custom configured for your specific needs including optional cases, CD-ROM, tape back-up, larger disk drives, additional memory and upgraded monitors. Call your Flex Sales Consultant today for expert assistance in setting up the right system for you.

Flex VL486SX-25

Intel™ 25 MHz 486SX
4 MB RAM • 128K Cache
210MB Hard Drive
3-1/2 Inch Floppy Drive
SVGA Color Monitor
DOS 6.0 • Windows 3.1

$1299

Flex VL486DX-33

Intel™ 33 MHz 486DX
4 MB RAM • 128K Cache
210MB Hard Drive
3-1/2 Inch Floppy Drive
SVGA Color Monitor
DOS 6.0 • Windows 3.1

$1499

Flex VL486DX2-50

Intel™ 50 MHz 486DX2
4 MB RAM • 128K Cache
340MB Hard Drive
3-1/2 Inch Floppy Drive
SVGA Color Monitor
DOS 6.0 • Windows 3.1

$1699

Flex VL486DX2-66

Intel™ 66 MHz 486DX2
4 MB RAM • 128K Cache
340MB Hard Drive
3-1/2 Inch Floppy Drive
SVGA Color Monitor
DOS 6.0 • Windows 3.1

$1299

All Flex systems come with the Flex Advantages including: 30 day "No-Risk" Money Back Guarantee, Full One Year Limited Warranty on Parts, Lifetime Factory Labor Warranty, Free

IBM PS/ValuePoint Specifications

Model	Speed	Hard Drive	Price*
PS/ValuePoint Si - SpaceSaver			
486SX	25 MHz	120 MB	$1249
486SX	25 MHz	212 MB	$1349
486DX	33 MHz	120 MB	$1579
PS/ValuePoint SpaceSaver (Includes 32-Bit VLB Slot, ZIFF socket, and is Pentium™ Overdrive Upgradeable)			
486SX	25 MHz	245 MB	$1559
486DX	33 MHz	245 MB	$1899
PS/ValuePoint Desktop (Includes 32-Bit VLB Slot, IFF socket, and is Pentium™ Overdrive Upgradeable)			
486SX	33 MHz	245 MB	$1759
486SX	33 MHz	340 MB	$1899
486DX	33 MHz	120 MB	$1799
486DX	33 MHz	245 MB	$1959
486DX	33 MHz	340 MB	$1999
486DX2	66 MHz	245 MB	$2299

IBM, ThinkPad and HelpWare are registered trademarks and PS/Valuepoint, TrackPoint II, are trademarks of International Business Machines Corporation. Pentium, Intel and the Intel Inside logo are registered trademarks of Intel Corporation.

VIDEO CARDS

DIAMOND

SPEEDSTAR PRO 1MB ISA/VLB	$109/$119
STEALTH PRO VLB 2MB	$339
VIPER VLB 2MB	$389

ATI Technologies

GRAPHICS ULTRA+ 2MB	$239
GRAPHICS ULTRATM PRO 2MB ISA/VLB/EISA	$359/$359/$399

ORCHID

Fahrenheit 1280+ 1MB ISA/VLB	$159/$169
Fahrenheit VA 1MB ISA (only)	$179
Celsius VLB 1MB/2MB	$239/$299

FAX MACHINES

HEWLETT-PACKARD

HP FAX-900 Plain paper fax	$769
HP FAX-310 Plain paper fax	$1179

MODEMS

ORCHID

	Int./Ext.
ACCURA 2400	$65/$75
ACCURA 96+fax96	$189/$209
ACCURA 144+fax144	$199/$229
Optima 144+ fax Pocket Ed.	$119

US ROBOTICS

	Int./Ext.
Sportster 9600 FAX	$139/$159
Sportster 14.4 FAX	$159/$179

FLEX *ultimate*
14,400/14,400 V.32 MODEM
Communication S/W and FaxWorks Fax S/W both for DOS and Windows.
Int. $149 Ext. $169

CD-ROM Bundles, Drives, Sound Cards, Video Boards and Speakers

CD-ROM Bundles

Sony Desktop Library	Internal *CDU-31A-LL/L*	$459
	External *CDU-7305*	$549
	Starter Kit *CDU-31A-LL/N*	$269
Creative Labs	Omni CD™ (Int.) *D1-131009*	$289
	Discovery CD 8 (Int.) *D1-DSCI-8*	$349
	Discovery CD 16 (Int.) *D1-DSCI-16*	$419
	Edutainment™ 16 (Int.) *D1-EDTI-16*	$479
	Digitaledge CD™ (Int.) *D1-DIGI*	$629
Texel	Home Bundle Int./Ext.	$499/$599
	MultiMedia Bundle Int./Ext.	$829/$929
	Business Bundle Int./Ext.	$599/$669

Drives

Mitsumi	*D1-LUOOS* (Int)	$169
Sony Double Speed SCSI	Internal *D1-CDU-561-01*	$369
	External *D1-CDU-7811-1*	$519
	Sony Interface Kit Int./Ext.	$99/$109
	Micro Channal Interface Kit	$199
Teac	Internal *D1-CD-50S*	$339
Texel	CD-ROM Int./Ext.	$489/$569
Toshiba	Internal *XM3401B-TA*	$399
	External *3401E100000*	$499
NEC-New 3x MultiSpin Family	3Xi Internal *D1-CDR-3XI*	$469
	3Xe External *D1-CDR-3XE*	$559
	3Xp Personal - White *D1-CDR-3XPW* or Gray *D1-CDR-3XPG*	$429
Chinon	Internal *D1-CDS-535*	$359
	External *D1-CDX-535*	$429

Sound Cards and Video Boards

MediaVision	ProAudio Spectrum 16	$165
	ProAudio Studio 16	$215
	Fusion CD 16 (Int.)	$639
	Pro 16 MultiMedia Internal System II	$849
Aztech	Sound Galaxy NX Pro Extra	$99
	Sound Galaxy NX II	$69
	Sound Galaxy Basic 16	$115
	Sound Galaxy Basic 16 Extra	$135
	Sound Galaxy Sony Adapter	$10
Creative Labs	Sound Blaster Pro Deluxe	$119
	Sound Blaster 16 Basic	$139
	Sound Blaster 16 SCSI-2™	$179
	Sound Blaster 16 SCSI-2 Advanced Signal Processing	$219
	Sound Blaster 16 MultiCD™	$169
	Sound Blaster 16 MultiCD Advanced Signal Processing	$189
	WaveBlaster™	$179
	Voice Assist™	$59
New Media Graphics	Tape It!	$345
	Watch It!	$249
ADS	Video Clipper	$339
	PC Prime Time	$379
	VGA-TV Elite	$269

Speakers

Altec Lansing	ACS50	$75
	ACS150	$115
	ACS100	$145
	ACS300	$285

ORDER INFORMATION: Minimum order $80. Minimum shipping and handling per order $11.95. MasterCard, Visa and Discover accepted for USA, Canada, APO, FPO and Puerto Rico. FLEXCARD accepted for continental USA only. A $10 surcharge on credit card orders for APO, FPO and Puerto Rico. C.O.D. order under $500.00, add $5.00; over $500.00, add $10.00 check warranty charge. Call for special UPS Red/Blue C.O.D. rates. APO/FPO, add 5% to cover additional shipping and handling. Call for PAL rates. CORPORATE/GOVERNMENT ORDERS: Corporations rated 1A1 or better and government agencies accepted on net 30 terms with receipt of a valid purchase order. Leasing Plans available for qualified businesses only. RETURN PRODUCT INFORMATION: All returns must have prior authorization from our Customer Service Department (1-800-955-1488 or 1-708-351-7172 Mon. - Fri. 7:30 a.m. to 6 p.m. & Sat. 9 a.m. to 2 p.m. CT). All returns must be in as-shipped condition, with original packaging, including all warranty cards and manuals. Product Returns may be subject to a restocking charge. We will only accept returns on unopened and non-downloaded software. Software compatibility guaranteed only if we have downloaded it on your new FLEX system. Thirty (30) day money back guarantee applies to FLEX system only (does not include printers or other non-installed peripherals). We will not accept returns on laser printers if toner cartridge has been installed. All prices and specifications subject to change, without notice. Not responsible for typographical or printing errors. All trademarks and registered trademarks are of their respective holders. © 1994 USA FLEX.

(708) 582-6206 • FAX (708) 351-7204
Gvn't 1-800-723-2260/Ed. 1-800-944-5568
Gvn't/Ed. FAX (708) 351-9871
Habla Espanol 1-800-723-5500 • (708) 582-6142
Pour les Francophones 1-800-723-2256 • (708) 582-6179
Verhandlungen in deutsch (708) 924-6680
(7:00 Uhr bis 15:00 Uhr)(Midnight to 9:00 a.m. CT)
Customer Service 1-800-955-1488
(7:30 a.m. - 6:00 p.m. Mon.-Fri., Sat. 9 a.m. - 2 p.m. CT)

USA ★ FLEX
1-800-876-5606
Open 24 Hours
Monday - Friday
9 A.M. - 4 P.M.
Saturday & Sunday
Code # WD0104

Circle 148 on reader service card

A New Year Multimedia Blowout!

$255

Fusion CD System

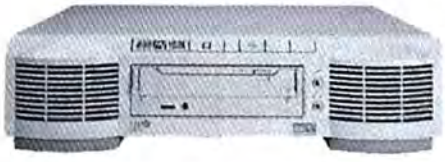
- The easy-to-use, plug in & play, multimedia upgrade system
- Includes great sounding, 8-bit, Pro AudioSpectrum Plus sound card
- Five exciting software packages including: Where in the World is Carmen Sandiego, Ultima Underworld, Compton's Family Encyclopedia, Battle Chess, & Wing Commander II

$245

Pro MovieSpectrum

- Create professional desktop videos on your PC
- Smooth real-time capture at 30 frames per second up to 160 × 120
- Still-frame capture with resolutions of 320 × 240 & 640 × 480
- 32,768 vibrant colors
- Includes add-in video card, Microsoft® Video for Windows™ & Macromedia's® Action!

CDPC XL



$605

- The first complete, fully-integrated, multimedia solution
- Includes dual-speed SCSI full photo CD compatible CD-ROM drive, amplifier, speakers & MIDI
- Brings high-quality sound to your PC with the best in 16-bit digital audio
- Includes 5 CD-ROM titles: Out of This World, Where in the World is Carmen Sandiego, & Comptons Multimedia Encyclopedia & Action

Pro Audio PowerPak

$75

- Allows your PC to follow your every voice command
- Includes ExecuVoice speech recognition and Monologue speech synthesis
- Audio compression and decompression
- Advanced sound editor & high quality microphone

Audio Port

$65

- PC Audio device
- High-performance portable module for PCs & notebooks
- Plugs into parallel port of any IBM PC/AT, PS/2 or notebook
- Transport Sound™ technology & built-in-speaker
- Headphone & external speaker outputs

MULTIMEDIA BUYER'S CLUB

It's easy to join the Media Vision Multimedia Buyer's Club - you automatically become a member when you buy from Media Vision Resource!

Why Call Resource?

- Order instantly from experienced multimedia sales representatives
- 30 day money back guarante • Toll free technical support 7 days a week
- Overnight delivery • All major credit cards accepted

Call 1-800-684-6699

International customers call (510) 770-8600
Monday thru Friday, 6am to 6pm PST

© 1993 Media Vision, Inc., 47300 Bayside Parkway, Fremont, CA 94538. (510) 770-8600. Pro MovieSpectrum, PowerPak, CDPC XL, Fusion CD & Audio Port are all trademarks of Media Vision, Inc. Any other trademarks or registered trademarks are the property of their respective holders. Any and all bundled software and prices are subject to change without notice.

MEDIA VISION RESOURCE

Circle 167 on reader service card

All New! NRI Hands-On Training in Database Management Using Microsoft Access®

Only NRI Gives You the Database Management Skills You Need to Succeed in Business Today

NRI at-home training with Microsoft Access® shows you how to take advantage of today's hottest computer career opportunities!

Today, employers everywhere value people who can use, program, or design a database management system — and that means tremendous growth potential if you have database software skills.

Now you can master this new technology and take advantage of the many opportunities in this exciting field with NRI's new training in Database Management. This breakthrough training includes Microsoft Access®, powerful database management software you use to create complex relational databases on any 386sx or higher model computer running Windows.

It's a fact: Labor Department statistics predict jobs for those who are in-the-know about database management systems will grow much faster than average through the year 2005. The reason is clear — with a centralized database of information that can be accessed by multiple users simultaneously, companies can now rely on the computer to transact and track business with increased efficiency, accuracy, and ease.

The development of database technology has created a diverse array of job openings — from data entry keyers to systems analysts, programmers, designers, trainers, and administrators.

And now, with NRI, you can get the database management skills you need to become a sought-after member of any business team.

NRI Hands-On Training Covers All the Bases — From the Basics to Systems Analysis to Programming

Your NRI training begins with the basics — what a database is and how it is used — then moves on to cover more complex topics of relational databases. Your lessons first introduce you to the components of a database management system: structure, terminology, and applications. You examine the fundamental concepts of flat-file and relational database management and then, using your own computer, you apply those concepts with a leading DOS database package included in your course. You begin by actually entering, editing, searching, and sorting data, then querying for specific records. You even learn how to produce any kind of printed output, including customized reports, form letters, and mailing labels.

Next you learn principles of systems analysis and why this component of database management is so critical to its more complex applications. You go on to perform a complete analysis of the organizational functions that need to be included within a database before creating your own database application.

You move on to gain a solid foundation in programming as you learn structured programming for the DOS environment using QBasic — no previous programming experience required! Now you're ready to explore the graphical user interface (GUI) environment of Microsoft Windows® with its object-oriented and event-driven methodologies. Continuing, you learn Access Basic and a macro language that lets you create custom relational databases.

Get Real-World Experience Using Microsoft Access Software

You're now ready to apply all you've learned about databases, systems analysis, and programming as you install, use, and maintain a state-of-the-art, relational database software package designed specifically for the Windows environment: Microsoft Access. You see first-hand how Windows provides the ease and power to create complex relational databases with rich interfaces as you learn the latest, in-demand techniques for using this fully relational, fully programmable software.

By the time you've completed your training, you're in total control of information and database management systems — making you a key player on any business team!

SEND TODAY FOR YOUR FREE CATALOG

NRI Schools
4401 Connecticut Ave., NW,
Washington, DC 20008

YES! Send me your FREE catalog right away! I'm interested in (☑ check one only): ❑ Database Management ❑ Multimedia Specialist

I understand the above courses require that I have access to or own a 386sx or higher model computer with a 3.5 inch drive and Windows version 3.0 or higher.

I am interested in NRI at-home training that includes computer equipment in another field. Please send me information about (☑ check one only):

❑ Computer Programming ❑ Programming in C++ With Windows ❑ Bookkeeping
❑ Microcomputer Servicing ❑ Fiction/Nonfiction Writing
❑ Digital Technology ❑ PC Applications Specialist ❑ Desktop Publishing

Name _____
(Please Print) Age

Address _____

City/State/Zip _____

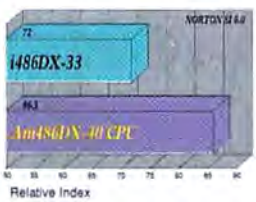
3420-0194

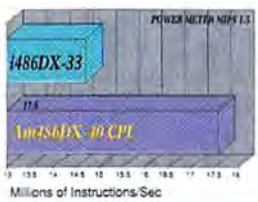
Exactly Like Intel... But Better !

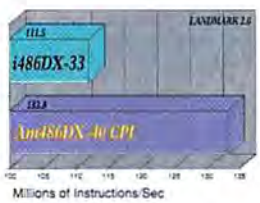
That's right.

AMD Am486DX-40 provides 20% more performance

With the AMD Am486DX-40, your system will perform up to 20% faster than an Intel 486DX-33 system, **FOR THE SAME PRICE!** And unlike other 486 look-alikes, the AMD Am486DX-40 is a true 486DX CPU. What does that mean? It has a built-in math co-processor and 8K internal cache. The AMD Am486DX-40 is even the same size as an Intel CPU with an identical, 168-pin configuration. This means compatibility is not a problem and upgradability is guaranteed. Furthermore, the AMD Am486DX-40 allows VESA Local Bus cards to run at the maximum allowable frequency (40MHz). So why buy an Intel-based system when for the same price you can get a 20% boost in performance?







SINCE 1973, PROFESSIONAL TECHNOLOGIES HAS WORKED HARD TO EARN ITS REPUTATION FOR QUALITY SALES AND SERVICE. THOSE YEARS OF HARD WORK HAVE PAID OFF BY MAKING PROFESSIONAL TECHNOLOGIES AND ITS ASSOCIATED COMPANIES ONE OF THE LEADING MANUFACTURERS OF QUALITY OFFICE AUTOMATION AND COMMUNICATIONS EQUIPMENT. FROM SERVICE TO MANUFACTURING, PROFESSIONAL TECHNOLOGIES HAS EMERGED AS A DIVERSIFIED, INTERNATIONAL HIGH-TECH COMPANY. CONTINUED GROWTH IS MOTIVATED BY SENSITIVITY TO MARKET DEMANDS, FAR-SIGHTEDNESS AND ADAPTABILITY TO CHANGING TIMES. AS WE ENTER INTO THE 21ST CENTURY, MANY ENTERPRISES HAVE FOUND IT IMPOSSIBLE TO ADAPT TO THE INCREASING ECONOMIC TURMOIL. PROFESSIONAL TECHNOLOGIES, HOWEVER, HAS NOT ONLY WEATHERED THE STORM, BUT HAS STEADILY GROWN IN SPITE OF IT. AT PROFESSIONAL, THE WILLINGNESS TO IMPROVE IS THE ONLY THING THAT HAS REMAINED UNCHANGED.

OUR COMMITMENT TO SERVICE IS PASSED ON TO OUR CUSTOMERS THROUGH THE LONGEST WARRANTY PERIOD OF ANY COMPANY IN THE COMPUTER INDUSTRY. EACH SYSTEM INCLUDES A **3-year warranty on parts**[1] AND A LIFETIME WARRANTY ON LABOR. TO ASSURE PROMPT RESPONSE TO OUR CUSTOMER'S NEEDS, OUR WARRANTY IS BACKED BY **24-hour Technical Support** AND AN **Express Parts Replacement Service**[2] WHICH MEANS YOUR SYSTEM WILL BE REPAIRED AS QUICKLY AS POSSIBLE.

TO SHOW OUR DEDICATION TO OUR CUSTOMERS, WE OFFER **SameDay Shipping**[3] ON OUR ADVERTISED, STANDARD CONFIGURATIONS. THIS MEANS YOU CAN ENJOY YOUR NEW PROFESSIONAL TECHNOLOGIES SYSTEM TOMORROW[4]. AND, IF YOU DECIDE, FOR ANY RESON, TO RETURN YOUR SYSTEM, WE OFFER A **30-day Money Back Guarantee**[5]. YOU CAN CALL **24-hours a day** TO SPEAK WITH A KNOWLEDGEABLE SALES REPRESENTATIVE,**7 days a week**. IF YOU ALREADY OWN A COMPUTER, YOU MAY CONTACT US THROUGH COMPUSERVE, GENIE, AMERICA ON-LINE, OR PRODIGY BY E-MAIL.

1. Monitors covered for one year. 2. Parts under 20 lbs. shipped by 2-day air, otherwise by ground. 3. Available on orders placed before 12PM Pacific time Monday through Friday, holidays excluded. 4. Additional shipping charges apply. Subject to availability of courier service in your area. 5. Shipping and software non-refundable. Cost of shipping back to MediAge is customer's responsibility. No restocking fee during first 30 days.

486SX/DX SYSTEMS

All of our 486SX and DX systems include the following special features:

Upgradability

- Assures future expandability for your system
- ZIF (Zero Insertion Force) Socket for easy installation
- P24T Ready for Pentium OverDrive Processor

CPU Heat Sink Cooling Fan

- Attaches directly to CPU
- Prevents CPU from overheating and being damaged

Diamond SPEEDSTAR PRO

- 32-Bit VESA Local Bus Performance
- Resolutions up to 1280 x 1024
- Up to 16.7 Million Colors
- Uses faster Cirrus Logic 5428 Chipset

PCI LOCAL BUS SYSTEMS

The new LOCAL BUS is here!

PCI promises to be the most popular new innovation in the computer industry this year. Offering compatibility with the Pentium processor, both current as well as upcoming low voltage models, and with exsting 486 CPU's, PCI (Peripheral Component Interface) delivers the fastest performance of any of the current bus standards while offering the widest range of processor support. Auto-configuration capabilities make PCI easier than every for integrating numerous add-on cards. The need for changing jumpers to set addresses and interrupts is eliminated. These new levels of built-in compatibility help protect your hardware investments well into the future.

CompuServe: 73241,1066 (MediAge Corporation) GEnie: XKY18546 (M.CORPORATIO)
America On-Line: MediAge Prodigy: YGGT78B (MediAge Corporation)

OPUSIS V E S A - 2

■ ISA / VESA Local Bus Motherboard ■ Pentium Technology Ready with P24T ZIF Socket ■ CPU Heat Sink/Cooling Fan ■ 4MB High Speed RAM ■ 3.5" and 5.25" High Density Floppy Drives ■ 420MB Hard Drive with Built-in Cache and 12ms Access Time ■ Performance Enhancing 32-bit VESA Local Bus IDE Controller ■ Diamond SPEEDSTAR PRO Windows Accelerator 32-bit Local Bus SVGA Card with 1MB Memory • Resolutions up to 1280x1024 and up to 16.7 million colors ■ 15" Flat Screen SVGA Monitor with 0.28mm dot pitch■ 101-key Enhanced Keyboar d ■ Hi-Resolution Serial Mouse ■ MPC Desktop Case • Built-in 60-Watt Stereo Speakers and Amplifier ■ OPUSIS Supra 16 Sound Card • TRUE 16-bit stereo, Windows Sound System Compatible ■ Multi Session, Double Speed Internal CD-ROM Drive 320ms Access, 300KB/sec Transfer Rate • Includes 4 CD Titles ■ 2 Serial, 1 Parallel, 1 Game Port ■ Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

■ 486SX-40 $1999 ■ 486SX2-50 $2049
■ 486DX-40 $2099 ■ 486DX2-66 $2299

OPUSIS V E S A - 1

■ ISA / VESA Local Bus Motherboard ■ Pentium Technology Ready with P24T ZIF Socket ■ CPU Heat Sink/Cooling Fan ■ 128K Cache ■ 4MB High Speed RAM ■ 3.5" and 5.25" High Density Floppy Drives ■ 210MB Hard Drive with Built-in Cache and 12ms Access Time ■ Diamond SPEEDSTAR PRO • Windows Accelerator 32-bit VESA Loca BusSVGA Card with 1MB Memory • Resolutions up to 1280x1024 and up to 16.7 million colors ■ 14" NonInterlaced SVGA Monitor with 0.28mm dot pitch ■ 101-key Enhanced Keyboard ■ Hi-Resolution Serial Mouse ■ MPC Desktop Case • Built-in 60-Watt Stereo Speakers and Amplifier ■ 16-bit Sound Blaster PRO Sound Card ■ Multi-Session, Internal CD-ROM Drive 350ms Access, 150KB/sec Transfer Rate • Includes 4 CD Titles ■ 2 Serial, 1 Parallel, 1 Game Port ■ Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

■ 486SX-40 $1499 ■ 486SX2-50 $1549
■ 486DX-40 $1599 ■ 486DX2-66 $1799

OPUSIS I S A

■ ISA Motherboard ■ 128K Cache ■ 3.5" and 5.25" High Density Floppy Drive ■ 170MB Hard Drive with Built-in Cache ■ SVGA Card with 1MB Memory Resolutions up to 1024X768 ■ 14" Non-Interlaced SVGA Monitor with 0.28mm dot pitch ■ 101-key Enhanced Keyboard ■ Hi-Resolution Serial Mouse ■ MPC Desktop Case • Built-in 60-Watt Stereo Speakers and Amplifier ■ High Performance Sound Blaster, Ad Lib, and Thunderboard Compatible Sound Card ■ Multi-Session Internal CD-ROM Drive 350ms access, 150KB/sec Transfer Rat e • Includes 4 CD Titles ■ 2 Serial, 1 Parallel, 1 Game Port ■ Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

■ 486DLC-33 $1269 ■ 486DLC-40 $1299

Professional technologies

Circle 166 on reader service card

PROFESSIONAL PCI

- PCI Local Bus Motherboard
- **Pentium Technology Ready with P24T ZIF Socket**
- **CPU Heat Sink/Cooling Fan**
- 256K Cache
- **8MB High Speed RAM**
- 3.5" and 5.25" High Density Floppy Drives
- **420MB Hard Drive with Built-in Cache and 12ms Access Time**
- **Diamond VIPER PCI**
  Weitek 9000 Windows Accelerator 32-bit PCI Local Bus SVGA Card with 2MB VRAM
  Resolutions up to 1280x1024 and up to 16.7 million colors
- **15" Flat Screen SVGA Monitor with 0.28mm dot pitch**
- **142-key Programmable Keyboard**
  24 User-Definable Function Keys
- Hi-Resolution Serial Mouse
- 2 Serial, 1 Parallel, 1 Game Port
- Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

486DX2-66	**$2699**
Pentium-60	**$3099**

PROFESSIONAL EISA

- EISA / VESA Local Bus Motherboard
- **Pentium Technology Ready with P24T ZIF Socket**
- **CPU Heat Sink/Cooling Fan**
- 256K Cache
- **8MB High Speed RAM**
- 3.5" and 5.25" High Density Floppy Drives
- **420MB Hard Drive with Built-in Cache and 12ms Access Time**
- **Super Fast 32-bit VESA Local Bus IDE Caching Controller with 512K Cache (Expandable to 16MB)**
- **Diamond SPEEDSTAR PRO**
  Windows Accelerator 32-bit VESA Local Bus SVGA Card with 1MB Memory
  Resolutions up to 1280x1024 and up to 16.7 million colors
- **15" Flat Screen SVGA Monitor with 0.28mm dot pitch**
- **142-key Programmable Keyboard**
  24 User-Definable Function Keys
- Hi-Resolution Serial Mouse
- 2 Serial, 1 Parallel, 1 Game Port
- Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

486SX-40	**$2099**
486SX2-50	**$2149**
486DX-40	**$2199**
486DX2-66	**$2399**

PROFESSIONAL VESA-3

- ISA / VESA Local Bus Motherboard
- **Pentium Technology Ready with P24T ZIF Socket**
- **CPU Heat Sink/Cooling Fan**
- 256K Cache
- **8MB High Speed RAM**
- 3.5" and 5.25" High Density Floppy Drives
- **420MB Hard Drive with Built-in Cache and 12ms Access Time**
- **Super Fast 32-bit VESA Local Bus IDE Caching Controller with 512K Cache (Expandable to 16MB)**
- **Diamond SPEEDSTAR PRO**
  Windows Accelerator 32-bit VESA Local Bus SVGA Card with 1MB Memory
  Resolutions up to 1280x1024 and up to 16.7 million colors
- **15" Flat Screen SVGA Monitor with 0.28mm dot pitch**
- **142-key Programmable Keyboard**
  24 User-Definable Function Keys
- Hi-Resolution Serial Mouse
- 2 Serial, 1 Parallel, 1 Game Port
- Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

486SX-40	**$1899**
486SX2-50	**$1949**
486DX-40	**$1999**
486DX2-66	**$2199**

24 Hour toll-free ordering, seven days a week!

PROFESSIONAL VESA-2

- ISA / VESA Local Bus Motherboard
- **Pentium Technology Ready with P24T ZIF Socket**
- **CPU Heat Sink/Cooling Fan**
- 256K Cache
- 4MB High Speed RAM
- 3.5" and 5.25" High Density Floppy Drives
- **420MB Hard Drive with Built-in Cache and 12ms Access Time**
- **Performance Enhancing 32-bit VESA Local Bus IDE Controller**
- **Diamond SPEEDSTAR PRO** Windows Accelerator 32-bit VESA Local Bus SVGA Card with 1MB Memory Resolutions up to 1280x1024 and up to 16.7 million colors
- 14" Non-Interlaced SVGA Monitor with 0.28mm dot pitch
- 101-key Enhanced Keyboard
- Hi-Resolution Serial Mouse
- 2 Serial, 1 Parallel, 1 Game Port
- Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

486SX-40	**$1399**
486SX2-50	**$1449**
486DX-40	**$1499**
486DX2-66	**$1699**

PROFESSIONAL VESA-1

- ISA / VESA Local Bus Motherboard
- **Pentium Technology Ready with P24T ZIF Socket**
- **CPU Heat Sink/Cooling Fan**
- 128K Cache
- 4MB High Speed RAM
- 3.5" and 5.25" High Density Floppy Drives
- 210MB Hard Drive with Built-in Cache and 12ms Access Time
- **Diamond SPEEDSTAR PRO** Windows Accelerator 32-bit VESA Local Bus SVGA Card with 1MB Memory Resolutions up to 1280x1024 and up to 16.7 million colors
- 14" Non-Interlaced SVGA Monitor with 0.28mm dot pitch
- 101-key Enhanced Keyboard
- Hi-Resolution Serial Mouse
- 2 Serial, 1 Parallel, 1 Game Port
- Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

486SX-40	**$1199**
486SX2-50	**$1249**
486DX-40	**$1299**
486DX2-66	**$1499**

PROFESSIONAL ISA

- ISA Motherboard
- 128K Cache
- 4MB High Speed RAM
- 3.5" or 5.25" High Density Floppy Drive
- 170MB Hard Drive with Built-in Cache and 12ms Access Time
- SVGA Card with 1MB Memory Resolutions up to 1280x768
- 14" Non-Interlaced SVGA Monitor with 0.28mm dot pitch
- 101-key Enhanced Keyboard
- Hi-Resolution Serial Mouse
- 2 Serial, 1 Parallel, 1 Game Port
- Microsoft DOS 6.0 and Windows 3.1 Installed with Manuals & Diskettes

486DLC-33	**$969**
486DLC-40	**$999**

Professional technologies

1-800-949-5018

376 Lemon Creek Drive Unit F, Walnut, CA 91789
Tel: (909) 468-1368 • Fax: (909) 468-1366

All brand names are trademarks of their respective companies. Prices and specifications may be subject to change without notice.

Circle 166 on reader service card

Software Training Videos

LEARN FROM THE EXPERTS

Windows 3.1

Tom Sheldon guides you through the basics of Windows operation, as well as demonstrating how to use the many powerful applications and accessories such as Notepad, Paintbrush, Write, and more.

Beginning Windows 3.1 $49.95
Created specifically for new users, Tom Sheldon guides you through the basics of Windows operation.

Windows 3.1 Applications $49.95
Picking up where Beginning Windows left off, Tom demonstrates how to use the many powerful applications of 3.1.

Windows 3.1 Adv. Tips & Tricks $49.95
Learn about creating macros, changing PIF files, object linking and embedding, and much more.

Optimizing Windows 3.1 $49.95
This tape will help you improve Windows operation on your system. Learn about Windows memory requirements and how to evaluate your computer's performance.

Combination Special 4 tapes **$159.95**

WordPerfect

Learning WordPerfect couldn't be easier! Karen Acerson, Carolyn Dillon, and Daniel Will-Harris are the expert instructors on this powerful software.

Beginning WP 6.x $49.95
You will learn to create, edit, save and print basic business documents, as well as streamline your word processing.

Intermediate WP 6.x $49.95
Learn how to search and replace, justify, create footnotes, special characters, macros and more.

Advanced WP 6.x part 1 $49.95
You'll learn the process behind creating columns, tables, graphs, styles and more.

Advanced WP 6.x part 2 $49.95
Learn about merge, customizing button bars, sorting, outlining, faxing, bookmark, indexing and other techniques.

VERSION SIX DOS

Combination Special 4 tapes **$159.95**

Other WordPerfect Videos

WordPerfect Macro Magic, Perfecting the Office, WordPerfect/Windows Update 5.2, WordPerfect for Windows Series.

Coming Soon:
WP 6.x Desktop Publishing

Excel

EXCEL

Basic instruction of Beginning, Intermediate, & Advanced tapes are taught by Dr. Robert Voss, a senior trainer & contributing author. Reed Jacobson, a certified Microsoft "Partner", teaches the more advanced features of Excel.

Beginning Excel/Windows $49.95
This tape will help the user understand the basic operation of this fabulous spreadsheet/database program.

Intermediate Excel/Windows $49.95
Learn about creating and changing charts, adding & formatting text, adding a legend, database analysis, and more.

Advanced Excel/Windows $49.95
This tape teaches about using macros, linking worksheets, consolidation, and much more.

Names, Arrays, & References $49.95
Learn about readable formulas with names, controlling names using arrays, using references to control range names, notation and relative references, and more.

Processing Data Files $49.95
Learn about importing files delimited by commas, importing files with fixed length fields, data parse command, dealing with implied decimal points, and more.

Combination Special 5 tapes **$195.95**

Word

In this series of videos, Tom Badgett (Windows) and Jim Turley (DOS) will help you understand the many features & functions of Word. From beginning, to intermediate, to advanced, these tapes are a must if you are using Word.

Beginning Word $49.95
Learn about menus, tool bar, defaults, and other basics to help you create letters, memos, and other documents.

Intermediate Word $49.95
This tape will show you how to search for, find & replace text, format paragraphs, use tables & columns, & more.

Advanced Word $49.95
Learn about linking and embedding, outlining, using macros, creating lists, using frames, importing graphics, & more.

Combination Special 3 tapes **$129.95**

WordPerfect Magazine 1991 Readers Choice

Voted #1 WordPerfect Videos

Order your training videos today!

1-800-937-3279 ext 10

Call, Write, or FAX for a *FREE* Catalog!

Karen Acerson
author of *WordPerfect: The Complete Reference* and *WordPerfect: From 5.0 to 5.1.*

Tom Sheldon
author of *Windows 3 Made Easy* and *NetWare 4: The Complete Reference.*

Judd Robbins
author of over 21 technical books including the recent best-seller *Mastering DOS 6.*

Daniel Will-Harris
author of *WordPerfect: Desktop Publishing in Style* and *Ventura Tips & Tricks.*

Tim Gendreau
Certified NetWare Level II instructor has taught hundreds of professionals.

These nationally recognized instructors and best selling authors will help you learn WordPerfect, Lotus, Windows, and other popular software in a few short hours. Just watch TV – no complicated manuals, no expensive and inconvenient classes, and your entire office learns for one low price. Over 500,000 business, government, and educational professionals have used LearnKey's "Teach Me How" videos to help them master their computer. LearnKey offers the best computer training by featuring the absolute best teachers. SATISFACTION GUARANTEED!

DOS 6.x

If your using DOS 6 on your computer and want to maximize your efficiency, don't miss this extremely thorough introduction to the biggest DOS upgrade ever. Taught by scientist, author, & lecturer Judd Robbins.

Beginning DOS 6.x $49.95
Learn about the DOS shell, managing screen display, directory structure, on screen help, and much more.

Intermediate DOS 6.x $49.95
This tape covers full-screen editor, restoring files, doubling hard disk space, virus protection, and much more.

Advanced DOS 6.x $49.95
Learn about DOS batch files, macros, QBasic, managing files, diagnosing system problems, and working with laptops.

Combination Special *3 tapes* **$129.95**

Other DOS tapes available
Optimizing DOS 6.x, DOS 6.x for Windows Users, DOS & Your PC, Upgrading to DOS 6.x, Controlling the DOS 6.x Startup, Mastering Batch Files, Mastering QBasic, Using DOS 5, Discover DOS (version 3.3 & up).

NetWare

Tom Sheldon, Certified NetWare Engineer, and author to the book *NetWare 4: The Complete Reference*, guides you through the powerful features and important changes of version 4.0.

Users Guide to NetWare 4.x $99.95
Leads the inexperienced user through a simple overview of networking to help remove the mystery of the network. 60 minutes

NetWare 4.x Concepts $99.95
An introduction for administrators, managers, supervisors and other users.
Learn about the new NetWare Directory Services for global naming, object management features, security & access rights, and more. 2 hours

SPECIAL OFFER! Buy both 4.x tapes and get Tom Sheldons book *Novell NetWare 4: The Complete Reference* from Osborne McGraw-Hill absolutely *FREE!*

NOVELL NETWARE 3.X

Tim Gendreau, certified NetWare Level II instructor and contributing author to the book *Inside Novell NetWare*, guides you on a step-by-step video tour of Novell NetWare 3.X.

NetWare 3.x Basics 70 min. $125.00
NetWare 3.x Security 67 min. $125.00
Menu & File Server Utilities 1 66 min. $125.00
Menu & File Server Utilities 2 106 min. $125.00
NetWare 3.x Printing 83 min. $125.00
Login Scripts 74 min. $125.00
Custom Menus 33 min. $125.00

Combination Special *7 tapes* **$695.00**

NetWare 3.X Installation 69 min. $125.00
Installing WordPerfect 5.1 on a Novell Network 101 min. $125.00

Lotus 123

Best-selling author, Judd Robbins addresses this powerful new upgrade on every level of version 2.4. Both DOS and Windows versions available.

Beginning Lotus 123 v 2.4 $49.95
Learn about updating and enhancing spreadsheets, using cell ranges, perform sophisticated calculations, and more.

Intermediate Lotus 123 v 2.4 $49.95
This tape teaches about add-in programs, WYSIWYG, BSOLVER, AUDITOR, MACROMGR, VIEWER, and more.

Advanced Lotus 123 v 2.4 $49.95
Learn about presentation quality graphs, file linking, macros, database management, and much more.

Combination Special *3 tapes* **$129.95**

Other Videos

Windows Primer Series
for the Technically Impaired
Networking with LANtastic
Harvard Graphics
with Mike McClure DOS 3.0/Windows
WordPerfect Presentations
WordPerfect Legal Series

Desktop Publishing Videos
with Daniel Will-Harris
CorelDRAW 3.0 Special Effects & Publication Design & Production
AmiPro DTP
Word for Windows DTP

SPECIAL OFFER! $29.95 **Supercharging DOS Applications under Windows**

SUPERCHARGING DOS APPLICATIONS UNDER WINDOWS
2 hrs

Scientist, lecturer, & writer, Judd Robbins will help you streamline your DOS applications while running under Windows. This tape will teach you the most efficient use of Windows facilities.

3 EASY WAYS TO ORDER

Major Credit Cards Accepted: For your convenience we accept Visa, MasterCard, or American Express, call 1-800-937-3279. Please have card available.
Purchase Order: FAX or mail an authorized PO. Your order will be processed immediately.
Check or Money Order: Business Checks and Money Orders are processed immediately. Personal Checks please allow 2 weeks to clear.
When ordering please include: Video titles and quantities desired, shipping and billing address, phone #, version needed & computer diskette size.
Shipping: USA shipping charges: UPS Ground $5.00, UPS Blue $10.00, Overnight $20.00, Regular U.S. Mail or Canada $8.00. Additional charges for International shipping. Utah residents add 6.25% sales tax.

FAX or mail orders to:
LearnKey, Inc.
93 S. MountainWay Dr. Rm. 10
Orem, UT 84058

Phone 801-224-8210
FAX 801-224-8211

LearnKey

30 day Money-back guarantee

1-800-937-3279 ext. 10

Circle 206 on reader service card

Software Training Videos

HARD DRIVES MEMORY SUPER SOURCE

LIFETIME* WARRANTY 100% GUARANTEED

1 X 9 SIMMS $CALL
70 NS
4 X 9 SIMMS $CALL
CALL FOR LATEST PRICES
SIMM-SIPP MODULES

1MB X 9-80NS SIMM-PC	CALL	256K X 9-100NS SIMM	CALL
1MB X 9-70NS SIMM	CALL	256K X 9-80NS SIMM	CALL
1MB X 9-60NS SIMM	CALL	256K X 9-70NS SIMM	CALL
1MB X 9-100NS 3 CHIP SIMM	CALL	256K X 9-100NS SIPP	CALL
1MB X 9-80NS 3 CHIP SIMM	CALL	256K X 9-80NS SIPP	CALL
1MB X 9-70NS 3 CHIP SIMM	CALL	256K X 9-70NS SIPP	CALL
1MB X 9-60NS 3 CHIP SIMM	CALL	1MB X 9-80NS SIPP	CALL
1MB X 9-70NS 3 CHIP SIPP	CALL	1MB X 9-70NS SIPP	CALL
1MB X 9-60NS 3 CHIP SIPP	CALL	4MB X 9-80NS SIMM	CALL
1MB X 9-80NS SIMM	CALL	4MB X 9-70NS SIMM	CALL
1MB X 9-70NS SIMM	CALL	4MB X 9-60NS SIMM	CALL
1MB X 9-60NS SIMM	CALL	1 X 32 - 4MB	CALL
1MB X 9-80NS SIPP	CALL	1 X 36 - 4MB	CALL
1MB X 9-70NS SIPP	CALL	4 X 32 - 16MB	CALL
1MB X 9-60NS SIPP	CALL	4 X 36 - 16MB	CALL

MOTHER BOARDS

OPTI

386DX-33-64K CACHE W/CPU	199
386DX-33-256K CACHE W/CPU	249
386DX-40-64K CACHE W/CPU	210
386DX-40-256K CACHE W/CPU	260
486SX-25-64K CACHE W/CPU	349
486DX-33-64K CACHE W/CPU	490
486DX-33-256K CACHE W/CPU	540
486DX-50-256K CACHE W/CPU	749

FREE

486DX-33 128K CACHE	537
486DX-50 256K CACHE	740
486DX-33 8-ISA,2-VESA 256K CACHE	612
486DX2-66 8-ISA,2-VESA 256K CACHE	894

OCEAN

JAGUAR 386DX-40 128K	139
HIPPO 486DX-33 ISA 256K*Dynamic Cache*	448
HIPPO 486DX-50 ISA 256K*Dynamic Cache*	609
JAGUAR IV 486DLC-40 128K Math Co	319
JAGUAR VESA486DX-33 256K 2-VLB*Dynamic Cache*	569

AMERICAN DIGICOM

486SX-25 ISA 128K	249
486DX2-66 ISA 128K	699
486DX-33 VESA 256K	469
486DX2-66 VESA 256K	729

SILICON STAR

386DX-40 128K Cache	159
486DX-33 ISA 128K Cache	429
486DX-33 VESA 256K Cache	479
486DX-33 EISA 256K Cache	534

NICE Made in U.S.A.

486DX-33 8-ISA, 2-VESA LB 256K	569
MINI 486DX-33 5-ISA, 3-EISA, 2-VESA LB 256K	642
MINI 486DX2-66 5-ISA, 3-EISA, 2-VESA LB 256K	903
486DX2-66 6-EISA 2-ISA 1 Meg Cache	1306
SUPER EISA 486DX2-66 8-EISA 1-VESA LB 512K	CALL!

A.I.R. Made in U.S.A.

486DX-33 8-ISA, 3-VESA 256K P24T Socket	549
486DX2-66 8-ISA, 3-VESA 256K P24T Socket	809
486DX-33 EISA 256K	789
486DX2-66 EISA 256K	1049

VEGA Made in U.S.A.

3/486DX-33 VESA 2-VL 256K,ZIF MULTI I/O IDE	519
3/486DX-33 VESA 3-VL 256K,ZIF	499
486DX2-50 ISA 256K	699
486DX2-66 3-VESA 256K	769

MICRONICS (U.S.A.)

MX-30 486DX-33 VESA 256K	699
MX-30 486DX2-50 VESA 256K	889
GEMINI 486DX-33 VESA 256K	795
GEMINI 486DX2-66 VESA 256K	1249

MYLEX (U.S.A.)

486DX2-66 256K MULTI I/O	1019
486DX-50 EISA 256K MULTI I/O	1239
486DX2-66 VESA 64K MULTI I/O	1049
486DX2-66 EISA/VESA 256K MULTI I/O	1299

AMI Made in U.S.A.

SUPER VOYAGER LC 486DX-33 256K	903
SUPER VOYAGER 486DX-33 VESA 2-VLB 256K	903
SUPER VOYAGER 486DX2-66 VESA 2-VLB 256K	1543
ENTERPRISE III VLB 486DX2-66 256K	1604

PRINTER MEMORY

LAPTOP & NOTEBOOK

EXTERNAL DRIVES ADD $149.

Quantum
FACTORY NEW – 2 YEAR WARRANTY ELS & LPS
5 YEAR WARRANTY ON P. DRIVES
1 YEAR WARRANTY ON 2.5" DRIVES

CAPACITY M/N	SPEED	SIZE	PRICE
IDE			
80MB NOTEBOOK	16MS	2.5"	$239
120MB NOTEBOOK	16MS	2.5"	349
160MB NOTEBOOK	16MS	2.5"	459
80MB ELS85A	17MS	3.5A1"	169
170MB ELS127A	17MS	3.5A1"	CALL
170MB ELS170A	17MS	3.5A1"	CALL
240MB LPS240A	17MS	3.5A1"	279
525MB LPS525AT	15MS	3.5A1"	599
SCSI			
170MB ELS127S	17MS	3.5A1"	CALL
170MB ELS170S	17MS	3.5A1"	229
240MB LPS240S	17MS	3.5A1"	245
525MB LPS525 SCSI-2	15MS	3.5A1"	599
700MB PR700 SCSI-2	13MS	3.5"	799
1GB P1080S SCSI-2	12MS	3.5"	1149
1.2GB P1223S SCSI-2	10MS	3.5"	1399
1.8GB P1800S SCSI-2	10MS	3.5"	1729

FUJITSU
FACTORY NEW – 5 YEAR WARRANTY

IDE			
M2624FA	12MS	3.5"	369
SCSI			
520MB M2624FA	11MS	3.5"	609
1.0GB M2694SA	11MS	3.5"	999
1.2GB M2266SA	14MS	FH	1079
2.0GB M2952SA	12MS	FH	1749
2.4GB M2952A	12MS	FH	1799

Maxtor
FACTORY NEW – FULL WARRANTY

IDE			
130MB 7131A	14MS	3.5A1"	189
213MB 7213A	15MS	3.5A1"	210
245MB 7345A	15MS	3.5"	225
345MB 7345A	15MS	3.5"	289
540MB 7540A	12MS	3.5"	379
SCSI			
130MB 7130S	15MS	3.5A1"	195
213MB 7213S	15MS	3.5A1"	219
245MB 7245S	15MS	3.5"	249
345MB 7345S SCSI-2	12MS	3.5"	369
540MB MAXSA540S	9MS	3.5A1"	549
1.2GB 12400 SCSI-2	9MS	3.5"	CALL!

TOSHIBA
5 YEAR WARRANTY ON 3.5"
1 YEAR WARRANTY ON 2.5"

SUPERFAST SCSI-2			
677MB MK4308FB	12MS	3.5"	$829
1.2GB MK538FB	12MS	3.5"	959
1GB MK1122FA	12MS	2.5"	429
200MB SCSI MK2204	17MS	3.5"	199
340MB IDE MK2326	12MS	2.5"	599

MICROPOLIS
FACTORY NEW – 5 YEAR WARRANTY

IDE			
528MB 2105A	10MS	3.5"	$ 759
542MB 2305A	10MS	3.5"	759
1GB 2112A	10MS	3.5"	969
1GB 2112A	10MS	3.5"	969
1.2GB 2217A	10MS	3.5"	1399
SCSI-2			
540MB MC2105	10MS	3.5"	$ 759
1.0GB MC2205	10MS	3.5"	969
670MB MC1624 SCSI-2	14MS	HH	679
540MB MC2105 SCSI-2	10MS	3.5"	759
1.2GB MC2210 SCSI-2	10MS	3.5"	969
1.3GB MC1117 SCSI-2	9MS	3.5"	1149
1.2GB MC1168 SCSI-2	11MS	FH	939
1.3GB MC1128 SCSI-2	14MS	FH	939
1.8GB MC1808 SCSI-2	14MS	FH	1849
1.75GB MC2217 SCSI-2	10MS	3.5"	1399
2.0GB MC1548 SCSI-2	11MS	FH	1599
2.1GB MC1809 SCSI-2	11MS	3.5"	1845
2.4GB MC1824 SCSI-2	11MS	FH	1849
3.5GB MC1906 SCSI-2	11MS	FH	2749

Seagate

IDE			
42MB ST351A/X	19MS	3.5A1"	$ 125
85MB ST3085A	19MS	3.5A1"	180
107MB ST3120	19MS	3.5A1"	180
130MB ST3144A	15MS	3.5A1"	159
213MB ST3243A	19MS	3.5A1"	249
213MB ST3243A	15MS	3.5A1"	195
250MB ST3144A	15MS	3.5A1"	199
245MB ST3283A	12MS	3.5A1"	CALL
260MB ST3290A	12MS	3.5A1"	245
340MB ST3360A	12MS	FH	299
209MB ST9235A	16MS	2.5"	399
340MB ST9385A	14MS	2.5"	599
540MB ST3600A	11MS	3.5A1"	665
540MB ST3660A	12MS	3.5"	619
SCSI			
240MB ST3630N	12MS	3.5A1"	CALL!
417MB ST3550N SCSI-2	12MS	3.5A1"	549
525MB ST3660N SCSI-2	11MS	3.5A1"	669
943MB ST3900N SCSI-2	12MS	3.5A1"	985
1420MB ST41900N	12MS	3.5A1"	1159
1350MB ST418009N	12MS	FH	1539
1.2GB ST31200N SCSI-2	10MS	FH	925
1.2GB ST41200N	14MS	FH	995
1.8GB ELITE-1	10MS	FH	1299
1.8GB ST41851	14MS	FH	1279
2.1GB ST42100N SCSI-2	14MS	FH	1429
2.1GB ST42100N SCSI-2	10MS	FH	1579
3.5GB ST43400N SCSI-2	10MS	FH	2079
4.0GB ELITE-3	10MS	FH	1999
1.7GB BARRACUDA-1 ST11950N SCSI-2	9MS	3.5"	1799
2.1GB BARRACUDA-4 ST12550N SCSI-2	9MS	3.5"	1999
2.2GB ST12400N SCSI-2	12MS	3.5"	1999

WESTERN DIGITAL
FACTORY NEW – 2 YEAR WARRANTY

IDE			
212MB WD2200	12MS	3.5A1"	$205
250MB WD2250	14MS	3.5A1"	229
340MB WD2350	14MS	3.5A1"	299
420MB AC2420	13MS	3.5A1"	429

CONNER
FACTORY NEW – 3 YEAR WARRANTY

IDE			
85MB CP30084E	19MS	3.5A1"	$ 154
120MB CP30134H	19MS	3.5A1"	159
170MB CP30174E	17MS	3.5A1"	179
212MB CP30254	12MS	3.5A1"	259
240MB CP30344	14MS	3.5A1"	279
340MB CP30544	14MS	3.5A1"	395
SCSI			
85MB CP30080E	17MS	3.5A1"	171
120MB CP30170E	17MS	3.5A1"	204
120MB N-170	17MS	3.5A1"	199
540MB CP3540 SCSI-2	10MS	3.5"	595
1.1GB CP31100 SCSI-2	10MS	3.5"	1015

HEWLETT PACKARD
FACTORY NEW – 5 YEAR WARRANTY

CAPACITY M/N	SPEED	SIZE	PRICE
SCSI			
1.0GB C2247	10MS	3.5"	$1045
1.0GB C3750F	13MS	FH	1395
1.6GB C3068	11.5MS	FH	1995
2.0GB C2610	11.5MS	FH	2245
2.1GB C2490	8.9MS	3.5"	2345

digital
DISK DRIVES FOR POWER USERS

SCSI-II			
1.0GB 31050	8.5MS	3.5"	$1155
1.0GB 31050	8.5MS	3.5"	1395
2.0GB 32500	12.5MS	FH	1895
3.5GB 32500	11.5MS	FH	2995

SAMSUNG

IDE			
120MB 3062	17MS	3.5A1"	185
250MB 3125	16MS	3.5A1"	235

DYNAMIC RAMS

1MB X 1-120NS	CALL!
1MB X 1-80NS	CALL!
1MB X 1-70NS	CALL!
1MB X 1-60NS	CALL!
256K X 1-150NS	CALL!
256K X 1-120NS	CALL!
256K X 1-100NS	CALL!
256K X 1-80NS DIPP	CALL!
256 X 1-80NS	CALL!
256K X 1-70NS	CALL!
256K X 1-60NS	CALL!
256K X 4-100NS	CALL!
256K X 4-80NS	CALL!
256K X 4-70NS	CALL!
64K X 4-150NS	CALL!
64K X 4-80NS	CALL!
64K X 4-120NS	CALL!
64K X 1-120NS	CALL!
64K X 1-100NS	CALL!

CACHE

8 X 8-15	5.00
32 X 8-15	16.00
8 X 8-25	4.00
32 X 8-25	7.50
64 X 4-25	8.00
16 X 4-25	5.00
64 X 4-20	8.00
32 X 8-20	8.00
64 X 4-20	10.00
16 X 4-15	5.50
16 X 4-15	9.00
64 X 4-15	15.00
64 X 1-15	20.00

MATH CO-PROCESSORS

INTEL	
8087 5MHZ INTEL	49.00
8087 2 MHZ INTEL	139.00
80287 6 MHZ INTEL	89.00
80287-8 8MHZ INTEL	49.00
80287-8 8 MHZ INTEL	49.00
80287-10 10MHZ INTEL	75.00
80287XL 10MHZ INTEL	75.00
80287XLT 12MHZ INTEL	75.00
80387-16 16MHZ INTEL	75.00
80387SX-20 20HZ INTEL	75.00
80387SX-25 25HZ INTEL	75.00
80387SX-16 16MHZ INTEL	75.00
80387SX-20 20MHZ INTEL	75.00
80387SX-25 25MHZ INTEL	75.00
80387SX-33 33MHZ INTEL	75.00
80487SX-25 INTEL	375.00
OVERDRIVE SX-DX2	CALL
OVERDRIVE SX-DX4	CALL
OVERDRIVE SX-DX5	CALL
WEITEK CAD	CALL
CYRIX	
83D87SX-16 16MHZ CYRIX	75.00
83D87SX-20 20MHZ CYRIX	75.00
83D87SX-25 25MHZ CYRIX	75.00
83D87SX-33 33MHZ CYRIX	75.00
83SF87SX-16 16MHZ CYRIX	69.00
83SF87SX16 16MHZ CYRIX	69.00
83SF87SX20 20MHZ CYRIX	69.00
83SF87SX25 25MHZ CYRIX	69.00
83SF87SX33 33MHZ CYRIX	69.00
83SF87SX CYRIX	69.00
WEITEK	
3167-20MHZ WEITEK	299.00
3167-25MHZ WEITEK	399.00
3167-33MHZ WEITEK	499.00
4167-25MHZ WEITEK	795.00
4167-33MHZ WEITEK	995.00
IIT	
2C87-8 8MHZ IIT	54.00
2C87-10 10MHZ IIT	54.00
2C87-12 12MHZ IIT	62.00
2C87-16 16MHZ IIT	69.00
3C87-16 16MHZ IIT	69.00
3C87-20 20MHZ IIT	69.00
3C87-25 25MHZ IIT	69.00
3C87-33 33MHZ IIT	69.00
3C87-40 40MHZ IIT	75.00
3C87-50 50MHZ IIT	89.00
83IIT20-25 25MHZ IIT	69.00
83IIT20-33 33MHZ IIT	69.00

INTEL CPUs

386 SX	
80386 SX-20	89
80386 SX-25	74
80386 SX-33	89
80386 SX-20 IO	89
486SX/S3	
80486 SX-25	239
80486 SX33	369
80486 DX50	459
80486 SX50	459
80486 DX-2/66	599
80486 SX-25	179
80486 SX-20	149
80486 SX/33	249

MOTHER BOARDS

386SX 33-64K CACHE W/CPU	$199
386SX-33-256K CACHE W/CPU	249
386SX-40-64K CACHE W/CPU	210
386SX-40-256K CACHE W/CPU	260
486SX-33-64K CACHE W/CPU	349
486SX-33-256K CACHE W/CPU	399
486SX-50-64K CACHE W/CPU	549
486SX-50-256K CACHE W/CPU	599

PROCESSOR UPGRADES

Kingston 386 & 486
Now you can use WINDOWS in enhanced mode get true multitasking & background operation for WINDOWS 3.1, OS/2 & other 386 specific software. Processor upgrades offer dramatically increased system performance for 16 & 32-bit software & daily multitasking.

SX NOW! supports IBM AT and others into a 386

25MHZ	219
33MHZ	219

SLC NOW! supports 286 PS/2, 50,50Z & 60 into a 486

25MHZ	179
25MHZ	279
50MHZ	369

486 NOW! supports PS/2, 70, 80 & COMPAQ into 486

33DMHZ	529
50DMHZ	629

MicroMaster supports all MCA PS/2 into a 486 (0-16MB memory)

486DX33	$795
486DX50	879

AT Master supports 386SX systems from IBM & COMPAQ (0-16MB)

486DX33	$789
486DX50	989

PS 2 HARD DRIVES

PS/2 50, 50Z, 55SX, 60, 70, 80, P70
INTERNAL DRIVE KITS - May be used as a high performance replacement or to add to your existing drive. The original IBM drive. Compatible with DOS 3.3, 4.01, 5.0, OS/2 2.0 and Novell. Includes IDE or SCSI-2 microchannel controller hard drive, mounting kit, ribbon and power cable, manual and hardware.

188MB 13MS IDE	383
213MB 15MS IDE	414
120MB 15MS SCSI	439
213MB 15MS IDE	453
260MB 13MS SCSI	513
340MB 13MS IDE	589
400MB 13MS IDE	699
512MB 12MS IDE	1043
512MB 12MS SCSI	1294
1.2GB 12MS SCSI	1442

PS/2 MODEL 25, 30, 30-286
INTERNAL DRIVE KITS - Includes controller, drive, mounting kit, cables and hardware. Supports DOS 5.0, Windows 3.1

42MB HARD DRIVE KIT	199
85MB HARD DRIVE KIT	252
120MB HARD DRIVE KIT	284
213MB HARD DRIVE KIT	323

MICROCHANNEL CONTROLLER

IDE	169
SCSI-2	179

IDE CONTROLLER supports all internal IDE drives. Zero slot installation for model 50 & 50Z.
SCSI-2 CONTROLLER supports 7 internal or external SCSI drives, CD Roms & Tape Backups, with 7 year warranty! Built support DOS 5.0, Windows & OS/2 compatible with existing IBM drive and controllers.

ZENITH | CANON | Apple | ACER | AT&T | EPSON | ALR | EVEREX

CALL FOR LATEST SUPER PRICES

FOR MEMORY PRODUCTS NOT LISTED – CALL FOR PRICES AND AVAILABILITY

TECHNICAL SUPPORT 1-215-9822-4640 | ORDERS ONLY 1-800-457-6937 | FAX 1-215-922-0116 | 6 3 6 6 7 9 1-800-MEMORY-2

PURCHASE ORDERS FROM GOVERNMENT AGENCIES – UNIVERSITIES – FORTUNE 2000 FIRMS

ALL CREDIT CARDS ARE VERIFIED FOR FRAUDULANT USE. **HOURS: MON-FRI 9-6 SAT 10-3. ORDERS FROM ANYWHERE IN THE USA OR CANADA CALL FOR CALL FOR CURRENT PRICES AND VOLUME DISCOUNTS.** PRICES AND AVAILABILITY SUBJECT TO CHANGE. ORDER LINES OPEN 9 DAYS. MINIMUM ORDER $50.00. USA SHIPPING AND HANDLING: AIR $12.00 – 2ND DAY AIR $8.00 – OVERNIGHT $19.00 – 2DD ADD $4.00. PA RESIDENTS ADD 6% SALES TAX. PREPAID ORDERS CALL FOR CONFIRMATION. ALL RETURNS REQUIRE RMA# AND ORIGINAL INVOICE. CANCELLED ORDERS AND RETURNS FOR CREDIT SUBJECT TO 25% RESTOCKING CHARGE. RETURNED MERCHANDISE MUST BE IN NEW CONDITION AND RECEIVED WITHIN 14 DAYS FROM INVOICE DATE. SORRY NO REFUNDS AFTER 14 DAYS. SHIPPING AND HANDLING CHARGES NOT REFUNDABLE. INTERNATIONAL ORDERS WELCOME. APO - FPO - ORDERS WELCOME. P.O.'S ACCEPTED FROM GOVERNMENT AGENCIES – UNIVERSITIES – FORTUNE 2000 COMPANIES – SUBJECT TO APPROVAL. ALL MEMORY PRODUCTS ARE THIRD PARTY. ALL TRADEMARKS ARE THE PROPERTY OF THEIR RESPECTIVE OWNERS. ALL WORLDWIDE TECHNOLOGIES PRODUCTS COME WITH A LIFETIME WARRANTY EXCEPT 30 DAY WARRANTY ON CHIPS AND SIMMS. ONE YEAR WARRANTY ON MOTHER BOARDS. ALL HARD DRIVES ARE MANUFACTURERS WARRANTY ONLY.

WORLDWIDE TECHNOLOGIES 437 Chestnut Street, Philadelphia, PA 19106 Customer Service 215-922-4640

Arlington Computer Products... Great Prices and Service Since 1984!

- PC Magazine: *"—Arlington offers worry-free mail order purchasing!"*
- PC Sources: *"—You can be confident that what you order will work!"*
- PC Computing Review: *"5 Star Pricing!"*
- PC Computing: *"Courteous service and terrific technical support!"*

HEWLETT-PACKARD

Laserjet IV w/Toner $1369
Laserjet IVP w/Toner..... $989
Laserjet IV L w/Toner $675
Laserjet IV SI w/Toner .. $2989
Laserjet IV M $1929
2MG Upgrade $99
4MG Upgrade $159
8MG Upgrade $349
Deskjet 500/500C $309/409
Deskjet 550C $575
Deskjet 1200C $1379
Pacific Page/XL..... $259/$699

Panasonic Office Automation

1124I . $229 2624 .. $359
2023 .. $199 3123 .. $279
2123 .. $229 4410 .. $535
2124 .. $295 4430 .. $639
2180 .. $169 4440 . $1149
1624 .. $349 4455 . $1659
4410/4450I 2 MG...$125

Canon

Notejet 486/with Built-In Printer ..... CALL

Canon

BJ-10EX $239
BJ-200 ..... $255*
BJ-230 ..... $389
BJ-330 ..... $489
BJC-600 ..... $589
BJC-800 ..... $1449
BJC-820 ..... $1579
LBP-8SX $979
LBP-430..... $579
*After Rebate until 12/31.

BJ-200

• 360 dpi. • 4 PPM

EPSON PRINTERS

LX810..... $169
FX870..... $259
FX1170.... $345
LQ570+ ... $235
LQ870 .... $425
LQ1070+ .. $355
LQ1170 ... $589
LQ2550 ... $869
DFX5000 . $1299
DFX8000.... $2189
Stylus 300 ... $229
Stylus 800 ... $279
Action 3250 .. $169
Action 1000 .. $579
Action 1500 .. $639

NO SURCHARGE FOR CHARGE CARDS!

OKIDATA

ML320 .. $295 ML395 .. $959
ML321 .. $415 3410... $1199
ML380 .. $209 OL400E. $495
ML520 .. $369 OL810 .. $899
ML590 .. $415 OL830 . $1089
ML591 .. $569 OL850 . $1199
OL400 2MB...$129

TEXAS INST.

TM4000/WINSX Color . $2119
TM4000/WINDX 2-50 .. $2699
TM4000/DX 2-40 Color $2949
TM486/DX 2/50E Color $3799
MicroWriter Basic $519
MicroWriter PS23 ..... $675
MicroWriter PS65 ..... $935

NETWORKING

Netware 3.12 5 User $579
Netware 3.12 10 User .. $1269
Netware 3.12 25 User .. $1699
Netware 3.12 50 User .. $2279
Lantastic Starter 5.0 .... $429
E143 Ethernet $185
NE2000 ..... $119
SMC Hub T/P $325
SMC Hub Coax $225
Ethercard +/+16 .... $89/$115
3 Com EtherLink II $179
Intel Ether 16 ..... $89
Intel Ether 16-5 Pak $429
Intel Ether 16-20 Pak .. $1629
Intel Token 16/S $389
Irma Board 3..... $399
Xircom Pocket Ethernet $269

SCAN. & DIGIT.

Epson 800C..... $1069
Epson Action Scanning. $989
Logitech ScanMan 256 . $169
Scanman 256 Omni Page$209
Summasketch 12×12.... $255
Summasketch 12×18.... $499

NEC

Jetmate 1000..... $269
P6200/6300 ..... $399/$599
P9300 ..... $825
Model 95 Pscrpt Laser .. $869
Model 95FX Laser $1079

MONITORS

NEC

3 FGE/3V $579/1499
4 FGE $679
5 FG/5 FGP..... $1245/1339
5 FGE $1049
6 FG/6 FGP.....$2249/$2299

MITSUBISHI

EGA..... $239
Diamond Pro 17 ..... $1019
Diamond Pro 21 FS ... $2149
HL6955 20" $1759

NANAO

F340IW . $689 F550I ... $995
T760IW-$2099 F550IW-$1149

VIDEO BOARDS

ATI Graph Ultra + 2MG . $209
ATI Graph Prof 1 MG... $319
ATI Graph Prof 2 MG... $329
Diamond Viper 2 MG ... $389
1024 VGA 16 Bit 1 MG... $69

CHIPS

256K/1 MG Chips each $3/$5
256K/1MB Simms ... $15/$49
4MB Simms..... $159
Epson Action 2 MG $99
HP 2MG Upgrade $99
OKI Laser 2MB..... $129

intel

80387 SX-16/20/25 ..... $75
80387-16/20/25/33..... $85
Overdrive SX20/25 $285/$339
Overdrive SX33 ..... $519
Overdrive DX25/33 $339/$495

MODEMS

intel

Int. 14.4/14.4 Fax..... $149
Ext. 14.4/14.4 Fax $169
PCMCIA 24/96 ..... $179
PCMCIA 14.4/14.4..... $279

SatisFAXtion MODEMS

200 2400 V.42/9600 Fax . $199
300 14.4/9600 Fax $219
350 14.4 ..... $249
400 14.4/14.4 Fax..... $259
400 Ext 14.4/9600 Fax .. $295

Hayes

Accura 96/Fax Int..... $189
Accura 14.4/Fax Int. $199
Hayes Optima 96..... $309
Hayes Optima 14.4/Fax . $369
Hayes Ultra 96 ..... $539
Hayes Ultra 96 14.4..... $589

PRACTICAL PERIPHERALS

Practical Per. 9600 Int... $169
Practical Per. 9600 Ext. . $179
Practical Per. 14.4 Int. .. $185
Practical Per. 14.4 Ext... $195
Practical Per. 14.4 Pocket $319
Practical Per. FaxMe $119

U.S. Robotics

14.4 Dual Std. 16.8 ..... $659
Sportster 14.4 Int. $145
Sportster 14.4 Ext..... $165
Sportster 14.4 Int. Fax .. $155
Sportster 14.4 Ext. Fax . $175
Courier Terbo Ext. $389

SOFTWARE

Aldus Pagemaker 5.0 ... $519
Corel Draw 4.0 ..... $359
D Base IV..... $409
Lotus 123 2.4/3.1 .. $279/$349
Microsoft Windows 3.1 .. $69
Microsoft Office $449
Microsoft DOS 6.0 Upg. . $59
Q & A 4.0 ..... $199
Word Perfect 6.0 ..... $249
Word Perfect Windows . $269

DRIVES & TAPES

Teac Dual Floppy $119
Toshiba 3½" 1.44..... $69
Connor 250 ..... $139
Connor Parallel 250 .... $319

COLORADO

Colorado Jumbo 120 ... $119
Colorado Jumbo 250 ... $165
Colorado Trakker 120 .. $275
Colorado Trakker 250 .. $319
Qik 80 Formatted Tape .. $21
Colorado 2GB Ext. $1069

AMERICAN UPS

250..... $99 600..... $259
400..... $155 900..... $369
450..... $185 1250.... $485

CD ROM OPTICAL DISKS

Intel Video Recorder ... $459
Media Fusion CD-16.... $389
Mitsumi Int. $199
Triple Speed!!!
NEC 3Xi $479
NEC 3Xe..... $569

SEAGATE HARD DISKS

40 MB for AT (ST251-1) $229
80 MB for AT (4096).... $279
120 MG 3144A $175
245 MG 3283..... $279
260 MG 3290A $225
452 MG 3550A $419

CONNOR HARD DRIVES

120 MB/174 MB $179/199
212 MB/540 MB ... $239/$689

Arlington Computer Products, inc.

Prices and availability subject to change without notice. Purchase orders accepted from Qualified Customers.

HOURS C.S.T.
7:30 - 8:30 pm Mon.-Fri.
9:00 - 5:00 pm Saturday

1970 CARBOY
MT. PROSPECT, IL 60056

VISA MasterCard DISCOVER

FOR ORDERS & QUOTES: **800-548-5105**
CUSTOMER SERVICE AND IN ILLINOIS 708-228-6333
SHIPPING 708-228-9748
TECHNICAL ASSISTANCE 708-228-1470
We Export! FAX 708-228-0516

Circle 8 on reader service card

WE WILL TRY TO MATCH OR BEAT ANY ADVERTISED PRICE. CALL FOR LATEST PRICING!!

WE ACCEPT PO'S FROM QUALIFIED FIRMS

M E M O R Y

NO SURCHARGE FOR MC, VISA AE & DISCOVER

CACHE MEMORY

	12NS	15NS	20NS	25NS
8Kx8	–	6.50	6.00	5.50
32Kx8	28.00	9.00	8.00	7.00
64Kx1	–	12.00	9.00	8.00
64Kx4	–	11.00	9.00	8.00
16Kx4	–	8.00	7.00	6.00
128Kx8	–	–	49.00	36.00

Individual D-RAM Chips

MEMORY FOR IBM & APPLE

	60NS	70NS	80NS	100NS
1Megx1	7.35	7.25	6.75	4.95
1Megx4	35.00	29.00	27.00	–
1Megx4 (Zip Pack)	25.00	23.00	21.00	–
256 x 4 (Video Zip)	–	–	11.95	10.95
256x4	4.75	4.50	–	–
256 x1	3.00	2.75	2.50	2.25
256 x16VRAM –		39.00	39.00	–
64x4	–	–	3.25	–
64x1	–	–	–	2.00

INTEL Math Chips

8087	45.00
8087-2	49.00
8087-1	85.00
80287-XL	55.00
80387-16 DX	45.00
80387-20 DX	55.00
80387-DX (Does All)	79.00
80487-DX (Does All)	339.00
Intel SX (Does All)	79.00
Intel SL Mobil	85.00
Intel 16SX	49.00
Intel 20SX	54.00

Change Your 386 to a 486DLC

JUST CHANGE CPU

- Plug Compatible • Cache Software • Uses 387 Math Chip
- 50-60% Faster • DOS & WINDOWS Compatible

		Landmark V 2.0
Cyrix 486 DLC 40MHZ	199.00	*130*
33MHZ	179.00	*107.2*
25MHZ	118.00	*N/A*
Cyrix 486 SLC 33MHZ	159.00	*103.5*
25MHZ	128.00	*78.4*
Cyrix 486 DRx²	Call	

CYRIX DRx² 386 to 486 Upgrade

Clock Doubler

- Single chip upgrade solution
- Clock doubling tech
- Compatible with industry standard 386DX CPU socket
- Compatible with DOS, Windows, 3.X, OS/2 1.3 and 2.x
- Uses industry standard math chip
- Easy to install—about 15 minutes

The Cyrix upgrade runs at twice the speed of your original 386 microprocessor combined with a 7K on-chip chace you will enjoy a performance boost of 100% and more. Ideal for any DOS, Windows or OS/2 application which requires a large amount of microprocessor horsepower.

CX486 DRx²-16/32 for 386DX-16mhz	269.00
CS486DRx²-20/40 for 386DX-20mhz	319.00
CX486 DRx²-25/50 for 386DX-25 mhz	359.00
DRx² 33/66 for SX-25 upgrade	PLEASE CALL

SIMM MODULES (Add $5.00 for SIPP)

	40NS	53NS	60NS	70NS	80NS	100NS
1Meg x 9 (3 chip)	65.00	65.00	52.00	50.00	49.00	–
1Meg x 9 (9 chip)	65.00	65.00	59.00	57.00	54.00	45.00
4Meg x 9	–	–	165.00	159.00	149.00	–
16Meg x 9 (9 chip)	–	–	879.00	849.00	–	–
16Meg x 9 (36 chip)	–	–	–	899.00	–	–

72 PIN SIMMS (EISA)

256 x 36 1Meg	–	–	–	59.00	–
512 x 36 2Meg	–	–	94.00	84.00	–
1 x 36 4Meg	–	224.00	209.00	199.00	–
2 x 36 8Meg (w/pal)	–	399.00	444.00	449.00	–
2 x 36 8Meg (w/o pal)	–	424.00	444.00	449.00	–
4 x 36 16Meg	–	749.00	749.00	769.00	–
8 x 36 32Meg	–	–	1699.00	1760.00	–
16 x 36 64Meg	–	–	3899.00	–	–

CYRIX FASMATH PROCESSOR

Programs executed up to 3X faster • Plug & object code compat. w/Intel

83D87-40MHz – **89.00** 83D87-33MHz – **79.00** 83S87-25SX Ver. – **69.00**
83S87-33SX – **89.00** **PC Week™** rated #1 over all math chips

5 Year Warranty • "All Downward Compatible"

AST MEMORY MODULES

MODEL	AMT. UPGRADED	AST PART #		PRICE
Advantage 12-386	4Meg Kit	5005-v3-004		228.00
Bravo 486	4Meg	500987-002		199.00
	8Meg Kit	500987-003		398.00
	16Meg	500987-004		658.00
Premium 386/25, 16 SX	1Meg	500718-001		69.00
Premium 386/33	1Meg	500718-002		59.00
Premium II 386SX20, 486-25, 25E, 33	1Meg	500780-003	WPB	59.00
	4Meg	500780-004	WPB	199.00
Premium Tower, 386/33TE, 486/25TE, 486/33TE	8Meg	500780-001	WPB	398.00
Cupid Memory Board	0-32Meg	500818-001		169.00

ZENITH MEMORY MODULES

MODEL	AMT. UPGRADED	AST PART #	PRICE
Z386/33, 25, 20, 33E	1Meg	ZA3800ME	59.00
Z386/33, 25, 20, 33E, 486/25E	4Meg	ZA3800MK	195.00
Z386SX	2Meg	Z-605-1 modules	119.00

MAGNAVOX

286/386SX-16, 386SX-20, 486SX-20 & 386-33 *all are 72PIN SIMM.*
1MEG – 59.00 4MEG – 195.00 8MEG – 429.00 16MEG – 769.00

MEMORY BOARDS

IBM Compatibles & PS/2

BOCA AT PLUS

USES SIMMS

16 BIT MEMORY BD. FOR 286, 386 AT • 0K-8Meg Bd. 4.0 LIM Compat. • New 5 Yr. Warr. Convent., Expnd. & Extnd. Memory • Supports DOS, OS/2, LIM/EMS & EEMS • Versatile Split Memory Addressing • Operates w/CPU Speeds to 33 MHz • Supports Desqview, Multitask operations • *Bd. made by Boca Research, AT plus*

0K – $89.00 2Meg – $177.00 4Meg – $265.00 8Meg – $441.00

BOCA XT 8 BIT BUS

• Expanded memory for XT • Lim 4.0 compat. 0-2Meg • Uses 256x1-100

0-K – **$99.00** 1Meg **$179.00** 2Meg – **$219.00**

IBM P/S2 32BIT EXPANSION BD.

0-32Meg, Ext.-Expnd. Memory Bd. for P/S2 70, 80, 90, Lim 4.0

0Meg	2Meg	4Meg	8Meg	16Meg	32Meg	64Meg
$179.00	$268.00	$374.00	$569.00	$959.00	$1935.00	$3255.00

PS/2 MCA 0-8MEG EXPANSION BD.

0-8Meg Extended and/or Expanded Memory for all IBM P/S2 Models 50, 50Z, 60, 55SX, 65SX, 16 Bit, 4.0 LIM Compat.

0K – **119.00** 2Meg – **267.00** 4Meg – **295.00** 8Meg – **471.00**

USES 1 X 8 SIMMS BOCA BR MC-80

IBM PS/2 SIMM MODULES

IBM PART NO.	WORKS WITH MODEL NO.	PRICE
30F5348 (512K)	30-286	37.00
30F5360 (2Meg)	30-286, 25-286, 50 MTHR BD	124.00
6450375 (1Meg)	80-041	79.00
6450379 (2Meg)	80-111, 311-121, 321, 081, 161	89.00
6451060 (4Meg)	80-A21, A-61, 80-A31, 80-111, 80-311	189.00
6450604 (2Meg)	70-061, E61, 121, 50Z, 55SX, 65SX, P-70, 55LS, 65LS, X-Station 120 & 130, 35SX, 35LS, 40SX	89.00
6450608 (2Meg)	70-A21, A-61, B-21, B-61, 35SX, 35LS, 40SX, Val Pt. 325T	90.00
78X8955 (128K)	25	35.00
34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX, 55LS, 65LS	199.00
87F9977 (4Meg)	55SX, 55LS, 65SX, 40SX, 35SX, 35LS	199.00
1057035 (512K)	P/S1-286	49.00
92F9935 (2Meg)	P/S1 & P/S1/386SX-2121	109.00
92F9694 (4Meg)	P/S1 & P/S1/386SX, Model-2121	209.00
6450902 (2Meg)	56, 57, 57SX,90, 95, P-75, 57SLC Value Point 77 486DX2, 486SX, SVR 85	95.00
6450128 (4Meg)	57SX, 90, 95, P-75, 57SLC, 56, 56SLC, P/S1, 386SX, Mod-2123, 2133, 2155, Val Pt 77, 486CS2, 486SX, SVR85 Value Point 77 486DX2, 486SX, SVR 85	209.00
6450129 (8Meg)	35SX, 40SX	419.00
6450130 (8Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC Value Point 77 486DX2, 486SX, SVR 85	439.00
79F0999 (2Meg)	LX40, N33SX, PS Note	114.00
79F1000 (4Meg)	LX40, N33SX, PS Note, Thinkpad 350, 350c	209.00
79F1001 (8Meg)	LX40, N33SX, PS Note	399.00
07G1826 (2Meg)	N51 (all)	109.00
07G1827 (4Meg)	N51 (all)	219.00
07G1828 (8Meg)	N51 (all)	449.00
07G1414 (2Meg)	Thinkpad 750, 750c	129.00
07G1415 (4Meg)	Thinkpad 750, 750c	239.00
07G1416 (8Meg)	Thinkpad 750, 750c	449.00
66G0094 (16Meg)	Thinkpad 750, 750c	1029.00
07G1420 (4Meg)	CL57LSX LpTp, Thinkpad 700, 700C, 720, 720C	249.00
07G1421 (8Meg)	CL57LSX LpTp, Thinkpad 700, 700C, 720, 720C	449.00
60G0378 (8Meg)	Thinkpad 350, 350c	285.00
60G0379 (16Meg)	Thinkpad 350, 350c	769.00
92F8804 (2Meg)	N45SL	119.00

COMPAQ MEMORY MODULES

MODEL	AMT. UPGRADED	CMPQ PART #	PRICE
DeskPro 386/33, 386/33L, 486/25L, 486/33L	2Meg Module	115144-001	109.00
	8Meg Module	116561-001	459.00
486/50L, System Pro	32Meg Module	116568-001	1499.00
DeskPro 386/33L, 486/33L	(Exp Bd)	116569-001	279.00
DeskPro 386/25, 386/20	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	219.00
DeskPro 386S-16MHz	1Meg Exp Bd	113633-001	149.00
	4Meg Exp Bd	113634-001	329.00
	1Meg Module	113646-001	79.00
	4Meg Module	112534-001	219.00
DeskPro 386/20E	1Meg Exp Bd	113644-001	149.00
DeskPro 386/25E	4Meg Exp Bd	113645-001	329.00
	1Meg Module	113131-001	79.00
	4Meg Module	113132-001	229.00
DeskPro 286N, 386N, 386SX/20, 386/25M, 486/33M, 486S/25M, 486S/16M	1Meg Module	116688-001	59.00
	2Meg Module	116689-001	89.00
	4Meg Module	116690-001	195.00
Port. 486C	8Meg Module	128877-001	429.00
M Series Exp Bd	0-64Meg	129160-001	279.00
DeskPro 386/16	1Meg Kit	103071-001	99.00
	4Meg Kit	103072-001	299.00
	1-2Meg Exp Bd	103069-001	239.00
	4-8Meg Exp Bd	103070-001	437.00
DeskPro 286	512K Kit	113012-001	49.00
DeskPro 5/60, 5/66M	8Meg Kit	149911-001	389.00
DeskPro 5/60, 5/66M	16Meg Kit	149949-001	836.00
DeskPro 5/60, 5/66M	32Meg Kit	149950-001	1799.00
DeskPro 5/60, 5/66M	64Meg Kit	149913-001	2999.00
DeskPro 5/60, 5/66M	128Meg Kit	149914-001	7450.00
Prolinea 386 3/25S, 3/25ZS	2Meg	141733-001	109.00
	8Meg	141742-001	320.00
Prolinea 486 4/25S, 4/33, 4/50, 4/66, COS	2Meg	141683-001	95.00
	4Meg	141684-001	209.00
	8Meg	141685-001	444.00
Prosignia PC Server, 486/33, 486 DSX/66	8Meg	141685-001	444.00
	16Meg	149320-001	786.00
	32Meg	149147-001	1749.00
Prosignia 5/60	16Meg	139132-003	CALL
Prosignia 5/60	32Meg	139132-004	CALL
Prosignia 5/60	64Meg	139130-001	CALL
Prosignia 5/60	128Meg	139132-007	CALL

COMPAQ LAPTOPS & NOTEBOOKS

LTE/286	2Meg Bd	117081-002	99.00
LTE/286	4Meg Bd	117081-003	204.00
LTE/386S/20	4Meg Module	121125-002	239.00
LTE LITE/20, 25, 25C	4Meg Module	129769-002	239.00
LTE LITE/20, 25, 25C	8Meg Module	129769-003	389.00
LTE LITE/20, 25, 25C	16Meg Module	129769-004	799.00
LTE LITE 4/25C, 4/25E, 433C	4Meg Module	142337-002	219.00
LTE LITE 4/25C, 4/25E, 433C	8Meg Module	142337-003	449.00
LTE LITE 4/25C, 4/25E, 433C	16Meg Module	142337-004	779.00
SLT/286	1Meg Module	110235-001	75.00
SLT/286	4Meg Module	110237-001	315.00
SLT/386	1Meg Module	118303-001	79.00
SLT/386	2Meg Module	118304-001	109.00
SLT/386	4Meg Module	118305-001	229.00
Contura 320, 325	2Meg	139497-001	103.00
	4Meg	139498-001	199.00
	8Meg	139499-001	369.00
Contura 4/25, 4/25C, 4/25CX	4Meg	146520-001	209.00
	8Meg	146521-001	399.00
	16Meg	146531-001	799.00

PCMCIA VERSION 2.0

(for Palmtop & Subnotebooks)

MODEL	PRICE	MODEL	PRICE
S-RAM Cards 1MEG	159.00	14,400/14,400 Data/Fax Modems	319.00
S-RAM Cards 2MEG	189.00	9600/9600 Data/Fax Modems	259.00
Card Pro (made by Data I/O) Transfers data from PCMCIA card to desktop PC, connects to a parallel port	299.00	2400/2400 Data/Fax Modems	179.00
		Lan Ethernet (10 Base T)	219.00
		Visual Media (CD Rom, Tape Dr)	279.00

FLASH MEMORY

2.5Meg 299.00 5Meg 419.00 10Meg 689.00 15Meg CALL 20Meg CALL

NO SURCHARGE FOR MASTERCARD, AMEX, VISA OR DISCOVER. PURCHASE ORDERS ACCEPTED FROM FORTUNE 2000, GOVERNMENT & INSTITUTIONS. California orders add 8.25% sales tax. Returned orders or ordered wrong parts are subject to a 20% restocking fee. (Memory chips not installed in boards.) We accept International orders shipped via EMS Air, APO, FPO orders welcome. Customers are expected to pay customs and "other" charges if shipped int'l. All credit card charges verified for fraudulent use. SORRY, NO REFUNDS AFTER 30 DAYS - EXCHANGES ONLY. We accept MC, VISA, Discover, AE, prepaid orders, purchase orders, wire transfer, COD (cashiers check) orders, cash & cashiers checks. Orders shipped by UPS, FEDX must be signed for.
• ALL MANufACTURER PART # S ARE FOR REFERENCE ONLY • MINIMUM ORDER $40.00
Price and availability subject to change without notice.

All products Brand new & guaranteed • We buy excess inventory

Trademarks are registered with their respective companies.

L.A. TRADE

22825 Lockness Avenue • Torrance, CA 90501

TOSHIBA LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
T1000SE/XE/LE	2Meg	PC14-PA8312U	94.00
T2000/T2000SX	2Meg	PC18-PA8317U	94.00
T2000SX/T1000LE	4Meg	PC-PA8314U	199.00
T2000SX/T1000LE	8Meg	PC14-PA8315U	369.00
T2000SXE/2200SX/T1800, 1850, C	2Meg	PC-PA2000U	94.00
T2000SXE/2200SX/T1800, 1850, C	4Meg	PC-PA2001U	199.00
T2000SXE/2200SX/T1800, 1850, C	8Meg	PC-PA2002U	369.00
T4400SX, SXC T6400	4Meg	PC-PA2004U	231.00
T4400SX, SXC T6400	8Meg	PC-PA2005U	463.00
T4400SX, SXC T6400	16Meg	PC-PA2010U	729.00
T4500, T4500C, T4600, T1900, T1900C (3.3 v)	4Meg	PC-PA2012U	249.00
T4500, T4500C, T4600, T1900, T1900C (3.3 v)	8Meg	PC-PA2013U	489.00
T4500, T4500C, T4600, T1900, T1900C (3.3 v)	16Meg	PC-PA2014U	1349.00
T3300SL	4Meg	PC-PA2007U	234.00
T3300SL	6Meg	PC-PA2005U	349.00
T3300SL	8Meg	N/A	459.00
T3300SL	16Meg	PC-PA2009U	719.00
T1200XE	2Meg	PC13-PA8306	97.00
T1600	2Meg	PC8-PA8302U	104.00
T3100	2Meg	PC3-PA7125E	179.00
T3100e	2Meg	PC9-PA8340U	129.00
T3100SX	2Meg	PC15-PA8308U	104.00
T3100SX	4Meg	PC15-PA8310U	209.00
T3200	3Meg	PC6-PA7137U	185.00
T3200SX	2Meg	PC12-PA8307U	129.00
T3200SX	4Meg	PC12-PA8909	224.00
T3200SXC	2Meg	PC19-PA8316U	129.00
T3200SXC	4Meg	PC19-PA8319U	219.00
T5100	2Meg	PC7-PA8301U	95.00
T5200/T8500	2Meg	PC10-PA8304U	114.00
T5200/T8500	8Meg	PC10-PA8313U	449.00

NOTEBOOK, LAPTOP MEMORY

MODEL	AMT. UPGRADED	MANU. PART #	PRICE
ALR Venture	4Meg	12407980	279.00
AST Notebook Prem Exec 386SX/20/25/25L	4Meg	500814-003	199.00
AST Power Exec 3/25C, 425EL	4Meg		209.00
AST Power Exec 3/25C, 425EL	16Meg		879.00
AST Power Exec 425SL	4Meg	501166-001	239.00
AST Power Exec 425SL	16Meg	501166-003	1049.00
AT&T Safari NSX/20	4Meg	PEC 37851	299.00
Bondwell B310 Plus	1Meg	23050-00100	109.00
Bondwell B310V, SX	1Meg		109.00
Bondwell B310V, SX	4Meg		229.00
Epson NB3	4Meg	A808511	209.00
Everex Tempo LX, LX20	2Meg	PCA 00053-0001	109.00
Everex Tempo Carrier	2Meg	PWA 0684-A-J000	119.00
Goldstar GS520 386SX/16	4Meg	S386-4M	299.00
Magnavox Metalis	1Meg, 4Meg	286, 386SX	119.00,219.00
NEC Prospeed 286, 386SX-16	1Meg	PC21-21	79.00
NEC Prospeed 286, 386SX-16	4Meg	PC21-22	209.00
NEC Prospeed 386	2Meg	PC31-21	119.00
NEC Prospeed 386	8Meg	PC31-22	399.00
NEC Prospeed 386SX-20	1Meg	PC43-21	79.00
NEC Prospeed 386SX-20	4Meg	PC43-22	219.00
NEC Ultralite HL/20, 20P, 25C	2Meg	PC47-21	119.00
NEC Ultralite HL/SL/25C	4Meg	PC47-22	219.00
NEC Ultralite SL/20, 20P	6Meg	PC49-21	319.00
NEC Ultralite HL/25C	8Meg	PC47-23	399.00
NEC Ultralite Versa	4 Meg/8Meg/16Meg	OP4104	249/489/899
Packard Bell 386SX, 286	1Meg, 4Meg	286, 386SX	109.00,209.00
Panasonic CF170, CF270, CF370	1Meg	CF-BA165	49.00
Sanyo 1791B NB	2Meg	MBC-NBMEM2	109.00
Sharp 6781, 6881, 6785	2Meg/4Meg		119.00/229.00
Sharp PC-6220	1Meg	CE 6218	79.00
Tandon, PC Brand, Dataworld	2Meg, 8Meg	NB386SX-20	109.00, 429.00
TI Travelmate 2000	1Meg	2568034-0001	79.00
TI Travelmate 3000	2Meg	2566996-1	84.00
TI 4000	4Meg, 16Meg		219.00, 1295.00
Twinhead, Altima, Compudyne Tandy 4860, 486SX, DX	4Meg/16Meg		219.00/999.00
Zeos 386SX Notebook	2Meg		109.00
Zenith Master Sport 386SX	2Meg	ZA-300-1	114.00
Zenith Master Sport SL, SLE	2Meg	ZA-4-4	114.00
Zenith Super Sport 286, 286E	1Meg	ZA-180-66	89.00
286E, SX	2Meg	ZA-180-64	179.00
SX Alpha	2Meg	ZA-180-86	179.00
SX Beta	2Meg	ZA-180-87	179.00

LASER PRINTER MEMORY UPGRADES

AMOUNT UPGRADED OK Bd	256k	1	2	3	3.5	4	5	6	8	16	32
Canon LBP4, 4Lite, 4plus	–	159	219	–	–	–	–	–	–	–	–
Compaq Pagermarq	–	–	99	–	–	195	–	–	389	–	–
Epson 6000, Action Laser	–	–	125	–	–	209	–	–	–	–	–
Epson Actinn Laser II	–	89	–	Call	–	–	Call	–	–	–	–
Epson 8000	–	89	–	Call	–	–	Call	–	–	–	–
Epson 1000, 1500	–	–	Call	–	–	Call	–	Call	–	–	–
HP 2, 2D–	–	–	119	–	–	199	–	–	–	–	–
HP 3, 3D, 3P, 2P, 2P+	–	–	109	–	–	189	–	–	–	–	–
HP 4, 4M, 4SI, 4SIMX	–	–	89	–	–	195	–	–	399	–	–
HP 4L	–	59	–	–	–	–	–	–	–	–	–
HP 3SI	–	69	–	–	–	199	–	–	399	–	–
HP 4SI	–	–	69	–	–	199	–	–	399	–	–
HP Deskjet 500, 500C, 550	59	–	–	–	–	–	–	–	–	–	–
HP Deskjet 1200C, 1200C/P	–	–	89	–	–	109	–	–	399	–	–
HP Paintjet XL300	109	–	–	–	–	304	–	–	499	907	–
IBM Laser 4019, 4019E	–	–	–	–	169	–	–	–	–	–	–
IBM Laser 4029	–	–	–	–	–	199	–	–	–	–	–
IBM Laser 4039, 4079	–	–	99	–	–	199	–	–	389	–	–
NEC 90, 290	–	–	139	–	–	–	–	–	–	–	–
NEC 95	–	–	99	–	–	–	–	–	–	–	–
Oki 400	–	–	95	–	–	–	–	–	–	–	–
Oki 400 E	–	135	189	–	–	–	–	–	–	–	–
Oki 830, 840	–	–	109	–	–	–	–	–	–	–	–
Packard Bell PB 9500	–	–	124	–	–	209	–	–	–	–	–
Panasonic 4420/4450I	–	–	129	–	–	209	–	–	–	–	–
Panasonic 4410/4430	–	–	126	–	–	195	–	–	–	–	–
Panasonic 4450	–	99	–	–	–	–	–	–	–	–	–
TI XL/PS17/PS35	–	55	–	–	–	–	–	–	–	–	–

H.P. COMPATIBLE FONT CARTRIDGE

BAR CODES Bar Code Reader Fonts 99.00
DESKJET SOLUTION for DkJt 500 & Plus, 92 Fonts, 4.5 pt-30 pt 99.00
IBM 4019, 4019E, FONT CARTRIDGE 209 Fonts, Turbo Card 105.00
TURBO 25 Comparable to Pacific Data's 25 CARTRIDGES IN ONE!™, 143 Fonts *(compat. with Epson Action Laser II and all HP Printers except HP4)* 79.00
TURBOSCRIPT™ 47 Scalable Fonts in Any Point Size (HP 2, 2D – 199) 149.00
TURBOSCRIPT™ 109, 109 Scalable Fonts to Any Point Size (HP 2, 2D – 199) ..179.00
TAX & FINANCE FOR IBM 4019, 4019E, 4029 ..... 139.00
TAX & FINANCE CARTRIDGE 84.00
OKI 400, 800 41 fonts, 11 typestyles 169.00

310-539-0019
FAX: 310-539-5844

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

CALL TOLL FREE **1-800-433-3726** (US and Canada)

ESTAB. 1985

SORRY, NO WILL CALLS

Mon-Fri, 8:00 a.m. to 5:00 p.m. PST
Sat. 10:00 a.m. to 12:00 noon

PRICES MAY FLUCTUATE. CALL FOR LATEST PRICING!!

FIVE YEARS IN THE MAKING

THE MIS PROMIS

"Five years!? How do you guys do it? How do you manage to be successful with all the big boys dropping their prices?" At MIS, not a day passes without being asked those questions. The answer is simple. MIS builds a better computer. We have steadfastly believed that our customers realized how much a computer actually costs when, after a six week wait, it shows up in your office with a defect or, a malfunction occurs in 1 out of 3 systems within the first year of use. We know that you want a well built and reliable computer that satisfies your company's requirements and you want it now.

"if you're looking for an all-around solid performer at a good price, the M466 should make your short list"

- PC World

"what emerges is the kind of quiet, unassuming machine that will sit in your office, do everything you need done, never give you a day's trouble and become an old friend about five minutes after you open the box. And it will run faster than is allowed in some states."

- InfoWorld Direct

PC WORLD BEST BUY

If fixing computers and holding on tech support lines is your life and you want to change it, give MIS a call.

PROMIS ST

Celebrating five years of quality products

PROMIS MT
486SX/25 through 486DX2/66 Local Bus or EISA, Pentium socket in a Mid-Tower case.
Starting at $1,795

PROMIS MAT
486SX/25 through 486DX2/66 Local Bus or ISA, in a mini AT case and easy upgrades. ZIF!
Starting at $1,495

PROMIS SL
486SX/25 through 486DX2/66 Local Bus or ISA. Slimline case for the work station.
Starting at $1,495

PROMIS AT
486SX/25 through 486DX2/66 Local Bus or EISA, Pentium upgrade and a full size AT case.
Starting at $2,195

MIS COMPUTER SYSTEMS

MADE IN THE U.S.A.

To order or for more informations, please call toll free

1-800-733-9188

intel inside

MICROSOFT WINDOWS COMPATIBLE

yes NetWare Tested and Approved

Prices and terms are subject to change without notice. 30 days money back does not include shipping charge. CA residents add appropriate sales tax. No surcharge on credit card purchases. Personal and company checks require 2 wks clearance. The Intel Inside Logo is a trademark of Intel Corporation. All other names and logos used here are registered trademarks of their respective companies.

Circle 172 on reader service card

COMPUTER DISCOUNT WAREHOUSE™

WHY PAY RETAIL? CDW® Sells For Less !

Start Off the New Year With Value-Priced Bundles: Save! Save! Save!

All Bundles Include Computer, Monitor, Printer, Software, Necessary Cables and a Box of Floppy Disks

AST® Authorized Systems Reseller

AST Advantage! Pro i486/SX25 Desktop

✔ 170MB HD, 2MB Ram ✔ Quicken, Prodigy, Microsoft Productivity Pack
Magnavox CM2089 Monitor
✔ 14" SVGA, 1024x768 Max Res.
US Robotics 14.4K External Modem
✔ V.32bis, V.42/V.42bis Data, 14.4K Fax
Canon BJ200 Bubblejet Printer
✔ PC Magazine Editor's Choice, 11/93
CA-Simply Money
✔ Personal Financial Software

ONLY! $1599.00

AST Bravo LC i486/SX25 Desktop

✔ 120MB HD, 4MB Ram ✔ Energy Star Certified ✔ Local Bus Video
Magnavox CM2089 Monitor
✔ 14" SVGA, 1024x768 Max Res.
US Robotics 14.4K External Modem
✔ V.32bis, V.42/V.42bis Data, 14.4K Fax
Canon BJ200 Bubblejet Printer
✔ PC Magazine Editor's Choice, 11/93
CA-Simply Money
✔ Personal Financial Software

ONLY! $1719.00

TOSHIBA

Toshiba T1900 LCD Notebook

✔ i486/SXA20 3.3 Volt CPU, 4MB Ram
✔ Type III PCMCIA Slot, 200MB HD

Canon BJ10SX Bubblejet Printer ✔ Portable, Laser-quality Printing
US Robotics WorldPort 14.4K Modem ✔ Pocket Portability, 9 Volt Battery or AC Power
CA-Simply Money ✔ Personal Financial Software
Deluxe Carrying Case

ONLY! $2069.00

Toshiba T4600 LCD Notebook

✔ i486/SL33 3.3 Volt CPU, 4MB Ram
✔ 1 Type II/1 Type IV PCMCIA Slots, 200 MB HD
Canon BJ10SX Bubblejet Printer
✔ Portable, Laser-quality Printing
US Robotics WorldPort 14.4K Modem
✔ Pocket Portability, 9 Volt Battery or AC Power
CA-Simply Money
✔ Personal Financial Software
Deluxe Carrying Case

ONLY! $2889.00

NEC

NEC Ready es i486/SX25 Desktop

✔ 170MB HD, 4MB Ram ✔ Energy Star Certified
✔ Local Bus Video
Magnavox CM2089 Monitor
✔ 14" SVGA, 1024x768 Max Res.
US Robotics 14.4K External Modem
✔ V.32bis, V.42/V.42bis Data, 14.4K Fax
Canon BJ200 Bubblejet Printer
✔ PC Magazine Editor's Choice, 11/93
CA-Simply Money
✔ Personal Financial Software

ONLY! $1749.00

NEC Ready CD2 Multimedia i486/SX25 Desktop

✔ 170MB HD, 4MB Ram, Local Bus Video
✔ Double-spin CD-ROM Drive, 16bit Sound Board
Magnavox CM2089 Monitor
✔ 14" SVGA, 1024x768 Max Res.
US Robotics 14.4K External Modem
✔ V.32bis, V.42/V.42bis Data, 14.4K Fax
Canon BJ200 Bubblejet Printer
✔ PC Magazine Editor's Choice, 11/93
CA-Simply Money
✔ Personal Financial Software

ONLY! $2219.00

COMPUTER DISCOUNT WAREHOUSE™

If You Find a Better Price, Call CDW® Before You Buy!

CDW® Sells for Less and Services You Better!

(800) 359-4CDW

WOR811

©1994 CDW® Computer Centers, Inc.

ALWAYS WORKING TO KEEP YOUR CPMPUTING NEEDS AHEAD!

COMPUTER DISCOUNT WAREHOUSE™

ANOTHER FACT ABOUT COMPUTER DISCOUNT WAREHOUSE™

WHY PAY RETAIL? CDW® SELLS SOFTWARE FOR LESS!

5TH GEN FASTBACK PLUS WIN 98.89
5TH GEN DIRECT ACCESS 63.15
5TH GEN FASTBACK PLUS V6.0 ..... 98.09
ADOBE PHOTOSHOP V2.5 ..... 529.24
ALDUS PAGEMAKER V5.0 ..... 552.45
ARTISOFT LANTASTIC SOFTWARE 66.23

LOTUS SmartSuite V2.1 UPGRADE ONLY $289.27
32689

ARTISOFT LANTASTIC AI V5.0 ..... 79.17
ARTISOFT LANTASTIC AI V5.0 WIN 91.09
ATI MEDIA MERGE V1.0 ..... 209.48
AUTODESK AUTOSKETCH WIN 166.10
BERKELEY AFTER DARK 33.07
BITSTREAM FACELIFT FOR WP V2.0 ..... 59.73
BORLAND C++ V3.1 W/APP FRMWRK 492.54
BORLAND C++ V3.1 WIN/DOS 321.26
BORLAND TURBO C++ V3.0 ..... 67.73
BORLAND MULTIMATE ADV II V1.0 ..... 277.90
BORLAND TURBO C++ VISUAL ED WIN 76.53
BORLAND DBASE IV V2.0 LICENSE/NODE 279.84
BORLAND DBASE IV V2.0 ..... 521.51
BORLAND DBASE IV V2.0 UPG 94.52
BORLAND PARADOX WIN V4.5 UPG 14.95
BORLAND PARADOX V4.5 DOS UPG 137.12
BORLAND PARADOX V4.5 DOS 524.30
BORLAND PARADOX V4.5 WIN 135.30
QUATTRO PRO/DOS V5.0 ..... 39.95
QUATTRO PRO/WIN V5.0 ..... 39.95
BORLAND TURBO PASCAL V7.0 DOS 97.17
BRODERBUND PRINTSHOP DLX WIN 49.20
BRODERBUND AUTOMAP WIN 59.87
CAERE OMNIPAGE PRO V2.1 ..... 589.53
CENTRAL POINT PC TOOLS V8.0A 119.32
CENTRAL POINT BACKUP V2.0 WIN 89.44
CENTRAL POINT PC TOOLS WIN 89.92
CALERA WORDSCAN+ V2.0 WIN 392.63
CA CLIPPER V5.2 COMP UPG 135.02
CONNECT EMAIL CONNECTION 61.67
COREL DRAW V3.0 WITH CD 128.33
COREL DRAW V4.0 WITH CD 379.89
COREL DRAW V4.0 UPG 214.95
COREL SCSII 65.51
CLARIS FILEMAKER PRO V2.1 WIN 116.98
DIAGSOFT QA PLUS WIN 85.09
DCA CROSSTALK V2.0 WIN 111.36
DELRINA PERFORM PRO PLUS V1.0 ..... 233.64
DELRINA WINFAX PRO V3.0 ..... 79.20
DELRINA WINFAX PRO NETWORK 243.37
ECLIPSE FAX WITH OCR 64.45
XTREE GOLD V3.0 ..... 96.22
GENERIC CADD V6.1 ..... 279.36
HAYES SMARTCOM WIN 41.17
HELIX NETROOM 1 USER 59.74
IBM OS/2 V2.1 ..... 145.07

IBM OS/2 V2.1 UPG 114.93
IBM DOS V6.1 UPG 52.39
INSET SYSTEMS HIJAAK PRO V2.0 ..... 81.74
INTEL FAXABILITY PLUS OCR V2.0 ..... 75.91
INTUIT QUICKBOOKS/WIN V2.0 ..... 98.09
INTUIT QUICKEN WINDOWS V3.0 ..... 45.52
INTUIT BUNDLE QUICKBOOK & QUICKPAY 117.39
INTUIT QUICKBOOKS V2.0 DOS 98.70
INTUIT QUICKEN DOS V7.0 ..... 45.89
INSIGNIA ACCESS PC V3.0 ..... 76.10
KODAK PHOTO CD ACCESS/WIN 31.75
LASERTOOLS PRINT CACHE 45.77
LOTUS 123 V3.4A SERVER 389.67
LOTUS 123 V2.4 NODE 302.08
LOTUS 123 V4.01 WIN 293.73
LOTUS 123 V4.01 WIN LIC 239.21
CC:MAIL 10 USER PACK 221.34
LOTUS ORGANIZER V1.1 ..... 96.10
LOT AMIPRO/WIN V3.01 ..... 226.97
LOTUS V3.4A UPG 99.42
LOTUS AMIPRO V3.01 COMP UPG 94.58
LOTUS SMARTSUITE UPG V2.1 ..... 269.27
LOTUS AMIPRO/WIN V3.01 VERS UPG 59.56
LOTUS 123/WIN V4.01 UPG 97.74
LOTUS FREELANCE GRAPHICS V2.01 UPG 99.42
LOTUS FREELANCE GRAPHICS V2.01 ..... 99.25
LOTUS 123 V2.4 ..... 322.65
LOTUS 123 2.4 UPG KIT 98.09
LOTUS IMPROV/WIN V2.0 ..... 99.42
MICROCOM CARBON COPY PLUS V6.1 ..... 124.98
MICROCOM CARBON COPY/WIN 124.98
PROCOMM PLUS/WIN 95.58
PROCOMM PLUS V2.01 ..... 69.82
MICROGRAFX ABC FLOWCHARTER/WIN 315.42
THE UNINSTALLER V2.0 ..... 42.84
MICROSOFT FORTRAN V5.1 ..... 95.17
MICROSOFT MACRO ASSEMBLER V6.1 ..... 119.51
MS OFFICE V4.0 WIN VER UPG 234.76
MS OFFICE V4.0 WIN COMP UPG 269.37
MICROSOFT OFFICE COMP UPG 344.57
MS OFFICE V4.0 WIN 449.61
MS WORD/DOS V6.0 VERS UPG 96.74
MICROSOFT WORD/DOS V6.0 ..... 302.63

Borland QUATTRO PRO V5.0 ONLY $39.95
31798

MICROSOFT VISUAL BASIC/WIN V3.0 ..... 119.51
MICROSOFT VISUAL C++ COMP UPG 179.58
MICROSOFT VISUAL C++ PRO UPG 126.05
MICROSOFT VISUAL C++ PRO 299.28
MS VISUAL C++ WINDOWS NT 676.66
MICROSOFT WINDOWS V3.1 UPG 48.87
MICROSOFT WINDOWS V3.1 LIC 79.23
MS WORD V6.0 WIN 297.40
MS WORD V6.0 WIN VERS UPG 94.48
MS WORD V6.0 WIN COMP UPG 117.73

MS WORD/WIN LICENSE UPG 99.25
MICROSOFT EXCEL V4.0 ..... 297.40
MICROSOFT EXCEL V5.0 ..... 297.39
MICROSOFT EXCEL V4.0 COMP UPG 98.91
MS EXCEL V5.0 UPG 97.27
MICROSOFT EXCEL V4.0 LICENSE 257.01
MICROSOFT WORKS/DOS V3.0 ..... 94.00
MICROSOFT WORKS/WIN V3.0 ..... 78.83
MICROSOFT PROJECT/WIN 413.46
MICROSOFT ACCESS V1.1 UPG 19.11
MICROSOFT ACCESS V1.1 ..... 299.35
MICROSOFT ACCESS DIST KIT 303.35

MICROSOFT WORD for Windows V6.0 COMP UPGRADE ONLY $117.73
32852

MICROSOFT ACCESS V1.1 LICENSE 259.45
MICROSOFT POWERPOINT/WIN UPG 117.46
MICROSOFT DOS V6.2 UPG 47.75
MICROSOFT DOS V6.0 UPG 3 PACK 113.82
MICROSOFT PUBLISHER/WIN V2.0 ..... 88.75
MICROSOFT MULTIMEDIA GOLF/WIN 44.60
MICROSOFT VISUAL BASIC COMP UPG 179.75
MS VISUAL BASIC PRO/WIN V3.0 ..... 94.00
MICROSOFT VISUAL BASIC V3.0 ..... 298.17
MS WIN/WRKGRPS ADD-ON USER 119.96
MS WIN/WRKGRPS ADD-ON V3.11 ..... 49.92
MS WIN/WRKGRPS ADD-ON 5 PACK 239.33
MS WIN/WRKGRPS ADD-ON LIC 54.29
MICROSOFT WINDOWS PRINTING SYS 95.75
MICROSOFT FOXPRO V2.5 WIN UPG 129.55
MS FOXPRO 2.5 DIST KIT UPG WIN 179.80
MICROSOFT FOXPRO V2.5 COMP WIN 178.71
MICROSOFT FOXPRO V2.5 WIN 298.17
MICROSOFT FOXPRO COMP V2.5 DOS 162.36
MICROSOFT FOXPRO V2.5 FOR DOS 301.84
MICROSOFT FOXPRO DIST V2.5 DOS 181.53
MICROSOFT FOXPRO WIN DIST KIT 303.24
MICSFT FOXPRO DOS V2.5 DIST KI 303.35
MICROSOFT PROF/T V1.0 WIN 119.29
MICROSOFT WINDOWS NT V3.1 VERS 263.46
MICROSOFT WINDOWS NT V3.1 SING 299.89
MICROSOFT OFFICE LICENSE PACK 389.67
MICROSOFT POWERPOINT V3.0 WIN 297.40
MICROSOFT WINDOWS V3.1 ..... 69.50
MOON VALLEY ICON HEAR-IT 32.79
NORTON CLOSE-UP HOST & REMOTE 115.36
ONLINE OPTINET 1-8 USERS 617.90
PACIFIC MICRO MAC-IN-DOS 58.63
PEACHTREE ACCOUNTING/WIN V2.0 ..... 106.67
POWERUP CALENDAR CREATOR PLUS 42.20
POWERUP CALENDAR CREATOR + WIN 42.22
QUALITAS 386 MAX V7.0 ..... 59.73
QUARTERDECK DESQVIEW 386 V2.6 ..... 89.91
QUARTERDECK QEMM V7.0.1 ..... 59.73
QUARTERDECK QEMM V7.0 UPG 41.17
QUARK EXPRESS 549.76

SOFTWARE PUB OFFICEWRITER V6.2 ..... 221.63
SPC PRO FILE & WRITE 153.99
SPC HARVARD GRAPHICS V3.06 ..... 366.79
SPC HARVARD GRAPHICS WIN V2.0 UPG 81.47
SPC HARVARD GRAPHICS WIN V2.0 ..... 249.55
SPC HARVARD GRAPHICS V3.0 NODE 366.02
SABER LAN WORKSTATION V1.0 ..... 67.73
SABER LAN WORKSTATION NODE LIC 28.91
CDW 5 CD-ROM BIZ BUNDLE 93.42
CDW 5 CD-ROM BUNDLE 97.80
CDW CD-ROM ENTERTAINMENT BUNDLE 61.89
SHAPEWARE VISIO V2.0 ..... 117.34
SPINNAKER FORMWORX/WIN V2.0 ..... 96.96
SOFTKEY PRECISION MAPPING 69.57
STACKER V3.1 SPECIAL DOS V6.0 ..... 52.00
STACKER V3.1 WINDOW/DOS 94.41
STACKER FOR OS/2 V1.0 ..... 119.39
SWIFTE LETTERHEAD FOR WORD 36.79
SYMANTEC Q&A V4.0 WIN 151.76
SYMANTEC ACT V1.1 FOR WINDOWS 249.00
SYMANTEC ACT V2.1DOS 249.22
SYMANTEC PC ANYWHERE V4.5 ..... 82.67
SYMANTEC PC ANYWHERE V4.5 REMOTE 82.92
SYMANTEC ANTI VIRUS V3.0 ..... 85.53
SYMANTEC NORTON SPEEDCACHE+ 56.87
SYMANTEC NORTON DESKTOP/WIN V2.2 ..... 109.58
SYMANTEC NORTON UTILITIES V7.0 ..... 111.14
SYMANTEC PC ANYWHERE/WIN 125.42
SYMANTEC Q&A 4.0 DOS 243.66
SYMANTEC Q&A LAN PACK 4.0 ..... 301.85
TOUCHSTONE CHECK IT PRO 58.61
TRAVELING SW COMMWORKS WIN 122.11
TRAVELING SW LAPLINK V 99.75
WORDPERFECT V6.0 DOS LICENSE 171.51
WORDPERFECT/WIN V6.0 LICENSE 199.35
WORDPERFECT/WIN V5.2 NODE W/DOC 193.78

WordPerfect V6.0 for Windows COMP UPGRADE ONLY $117.11
32103

WORDPERFECT OFFICE SERVER V4.0 ..... 168.99
WORDPERFECT/DOS V6.0 ..... 275.92
WP OFFICE/WIN V4.0 CLIENT 288.16
WP PRESENTATIONS V2.0 W/SCNR 125.50
WORDPERFECT/WIN V5.2 ..... 277.98
WORDPERFECT/WIN V6.0 ..... 279.92
WORDPERFECT/WIN V5.2 LIC 167.50
WP/DOS V5.1 COMP UPG 113.55
WP/DOS V6.0 COMP UPG 114.15
WP/WIN V5.0 COMP UPG 117.11
WP V6.0 WIN W/QUATTRO COMP UPG 131.73
WP V6.0 DOS LIC UPG 72.81
WP OFFICE V4.0 CLIENT PK UPG 138.92
WP PRESENTATIONS V2.0 UPG 79.90
WORDPERFECT/DOS V6.0 UPG 99.00
WORDPERFECT/WIN V5.2 UPG 98.09
WORDPERFECT/WIN V6.0 UPG 99.29

COMPUTER DISCOUNT WAREHOUSE™

CDW® HOURS
Sales: 7:30-7:30 CDT Mon-Fri. / 9:00-5:00 CDT Sat.
TECH SUPPORT
8:00-7:00 CDT Mon-Fri. / 9:00-5:00 CDT Sat.
(708) 291-7575

Credit Card charges are not submitted until time of shipment. Freight is calculated as the carrier's actual freight charge plus insurance and packaging material. The cost of insurance is 0.30% (0.0030) of the order total. Packaging materials will not exceed $4.00 per 1 package order or $6.00 per multi-package shipment. For your protection we ship only to your verified billing address. Non-defective returns subject to restocking fee. Allow 10 business days for shipping when paying by personal check. Software, chips and other electronic components are not returnable. All pricing subject to change. ™ - Trademarks of all companies listed in this ad.

WE SELL NAME BRAND ITEMS FOR LESS!

(800)-359-4CDW

NASDAQ

CDW® is a NASDAQ traded company
TICKER SYMBOL CDWC
D & B Rated 4A1 Duns 10-762-7952

WOR811

FAX (708) 291-1737

©1994 CDW® Computer Centers, Inc.

Turn the Page For More CDW® Savings.

No Surcharge For Credit Cards

High Volume Bids Invited

Circle 68 on reader service card

COMPUTER DISCOUNT WAREHOUSE

COMPUTER DISCOUNT WAREHOUSE™

NEW LOWER PRICES!

TOSHIBA T4600 i486SL/33 LCD NOTEBOOK

SPECIAL PURCHASE!

- 33 MHz i486SL Processor
- 4MB RAM Expandable to 20MB
- 120MB or 200MB Hard Drive
- 2 PCMCIA Slots
- 1.44MB Diskette Drive
- Pre-Installed Software: MS-DOS® V 6.0, Windows®
- Free Case (While Supplies Last)
- Ball Point™ with QuickPort™
- Weighs only 6.9 lbs.

120MB..... ONLY $2289.00 CDW 29539

200MB..... ONLY $2499.00 CDW 29540

WHY PAY RETAIL?

CDW® Sells For Less

Microsoft MS-DOS V6.2

NEW!

- DoubleSpace Disk Compression with New DoubleGuard and ScanDisk for More Data Protection
- MemMaker Memory Management
- Anti-virus, Backup and Undelete
- A Must-have for Windows Users

3.5" UPG..... ONLY $47.75 CDW 32715

Step-up from V6.0.Only .... $9.95 CDW 33244

HARDWARE, SOFTWARE & PERIPHERALS AT DISCOUNT PRICES

NETWORKING PRODUCTS

NOVELL

Netware V4.01

5 USER CD	889.00
10 USER CD	1989.00
25 USER CD	2994.00
50 USER CD	3937.00

Netware V3.12 NEW

V3.12 5 USER 3.5"	579.00
V3.12 10 USER 3.5"	1299.00
V3.12 25 USER 3.5"	1899.00
V3.12 50 USER 3.5"	2519.00
V3.12 100 USER 3.5"	3509.00

Call for Pricing on NetWare CD-ROM Versions and Upgrades

NETWARE LITE 1 USER	69.00
NETWARE LITE STARTER KIT	139.39
NE2000 PLUS ETHERNET COAX CARD	109.90
NE3200 w/TPA	539.82

THOMAS-CONRAD

TC5143 ETHERNET COAX	122.87
TC5143 ETHERNET COAX 6PK	599.55
TC5143 ETHERNET 10BT	95.95
TC5143 ETHERNET 10BT 6PK	484.25
TC6242 ARCNET 8 BIT COAX CARD	69.00
TC6245 ARCNET COAX CARD	179.99
TC6242 ARCNET+ TP CARD	99.94
TC6245 ARCNET ALL-IN-ONE CARD	258.84
TC6040 ARCNET PASSIVE 4 PORT HUB COAX	39.50
TC6250 ARCNET ACTIVE 8 PORT HUB COAX	242.26
TC5055 ETHERNET 8 PORT CON 10BT	328.74
TC6151 ARCNET 16 PORT SMART HUB COAX	672.12
TC4035 TOKEN RING 4MBPS CARD	269.89
TC4045 TOKEN RING 16/4 CARD	359.44
TCNS 100MBPS COAX CARD	438.57
TCNS 100MBPS EISA COAX CARD	509.91
TCNS 100MBPS STP CARD	457.69
TCNS 100MBPS FIBER OPTIC CARD	716.60
TCNS 100MBPS 6 PORT SMART HUB COAX	1366.27
TCNS 100MBPS 8 PORT SMART HUB COAX	1149.47
TCNS 100MBPS 8 PORT SMART HUB STP	1169.75
TCNS 100MBPS 8 PORT SMART HUB FIBER	1465.80

ARTISOFT

AE3 ETHERNET COMBO CARD	198.98
NODERUNNER 2000A	217.34
NODERUNNER 2000T	176.47
NODERUNNER 2000C	176.47
NODERUNNER/SI 2000A	119.86
NODERUNNER/SI 2000T	97.44
NODERUNNER/SI 2000C	97.44
CENTRAL STATION II	389.89
10BT 5 PORT INTERNAL HUB	269.33
NODERUNNER STARTER KIT WINDOWS	499.57
LANTASTIC AI V5.0	79.17
LANTASTIC AI V5.0 WINDOWS	89.98
LANTASTIC SOFTWARE	69.80
LANTASTIC FOR WINDOWS SW	129.68
T-RUNNER 8 PORT 10BT	299.88
T-RUNNER 12 PORT 10BT	497.41

SMC

ULTRA16 ETHERNET COAX	109.25
ULTRA16 ETHERNET COAX 6PK	583.68
ULTRA16 ETHERNET 10BT	109.25
ULTRA16 ETHERNET 10BT 6PK	583.68
ULTRA16 ETHERNET COMBO	125.35
ULTRA16 ETHERNET COMBO 6PK	693.48
ETHERCARD+ ELITE 8 BIT COAX	97.82
ETHERCARD+ ELITE COAX	119.64
ETHERCARD+ ELITE COAX 6PK	658.73
ETHERCARD+ ELITE MCA COAX	189.26
ETHERCARD+ ELITE 10BT	119.64
ETHERCARD+ ELITE 10BT 6PK	633.09
ETHERCARD+ ELITE MCA 10BT	189.55
ETHERCARD+ ELITE EISA 10BT	579.78
ETHERCARD+ ELITE COMBO	139.57
ETHERCARD+ ELITE COMBO 6PK	766.59
3608 ETHERNET 9 PORT CON 10BT	329.61
3512 ETHERNET 12+2 PORT CON 10BT	614.76
PC600WS ARCNET CARD COAX	125.93
PC650WS ARCNET CARD TP	119.88
PC600FS ARCNET CARD COAX	199.29
PC130 ARCNET CARD COAX	68.50
ARCNET 8 PORT ACTIVE HUB COAX	229.41
TOKENCARD ELITE 16/4	299.88

NETWORKING PRODUCTS

3Com

3C503 ETHERLINK II COAX	159.84
3C509 ETHERLINK III COAX	119.50
3C509 ETHERLINK III COAX 5 PK	529.12
3C509 ETHERLINK III 10BT	119.50
3C509 ETHERLINK III 10BT 5 PK	537.97
3C509 ETHERLINK III MCA 10BT	242.45
3C529 ETHERLINK III MCA COAX 5PK	992.27
3C529 ETHERLINK III MCA 10BT 5PK	976.69
3C509 ETHERLINK III COMBO	139.96
3C509 ETHERLINK III COMBO 5 PK	584.84
3C579 ETHERLINK EISA COAX	229.91
3C579 ETHERLINK EISA 10BT	229.91
3C1627 12 PORT LINKBUILDER 10BT	628.97

Xircom

PE310BC POCKET ETHERNET COAX	314.89
PE310B2 POCKET ETHERNET COAX	279.60
PE310BT POCKET ETHERNET 10BT	279.31
PA202B6 POCKET ARCNET COAX	236.30
PT218BT POCKET TOKEN RING 16/4	529.14
PT218B3 POCKET TOKEN RING 16/4	527.08
PPX03 PARALLEL PORT MULTIPLEXOR	79.80

IBM TOKEN RING

IBM TOKEN RING 16/4 ISA	501.40
IBM TOKEN RING 16/4 MCA	659.95
IBM TOKEN RING MAU	458.88

INTEL NETWORKING

ETHEREXPRESS 16 COAX	99.33
ETHEREXPRESS 16 COAX 5PK	454.13
ETHEREXPRESS 16 COAX 20PK	1698.38
ETHEREXPRESS MCA COAX	166.52
ETHEREXPRESS 16 10BT	99.33
ETHEREXPRESS 16 10BT 5 PK	454.13
ETHEREXPRESS 16 10BT 20PK	1698.38
ETHEREXPRESS MCA 10BT	166.52
ETHEREXPRESS 16 COMBO	116.77
ETHEREXPRESS 16 COMBO 5PK	546.08
ETHEREXPRESS 16 COMBO 20PK	2036.93
ETHEREXPRESS FLASH 10BT	111.88
ETHEREXPRESS FLASH 10BT 5PK	519.62
ETHEREXPRESS FLASH COMBO	131.82
ETHEREXPRESS FLASH COMBO 5 PK	626.84
ETHEREXPRESS EISA COAX	411.30
TOKENEXPRESS 16/4	399.53
NETPORT II COAX	358.97
NETPORT II 10BT	358.97
ETHEREXPRESS ISA HUB	519.93
ETHEREXPRESS ISA HUB EXP	449.96

TAPE, REMOVABLE & FLOPPY DRIVES

COLORADO MEMORY SYSTEMS INC.

JUMBO 120MB INTERNAL	99.90
JUMBO 250MB INTERNAL	167.97
TRAKKER 120MB PARALLEL PORT	286.90
TRAKKER 250MB PARALLEL PORT	335.88
POWERTAPE 2GB SCSI INTERNAL	947.97
POWERTAPE 2GB SCSI EXTERNAL	1099.90
POWERDAT 2GB SCSI INTERNAL	1524.33

I-MEGA

TAPE 250MB INSIDER 1"	189.97
TAPE 250MB INSIDER HH	189.88
FLOPTICAL 21MB INSIDER	379.27
BERNOULLI 90MB PC POWERED	449.66
BERNOULLI 150MB INSIDER SCSI	489.77
BERNOULLI 150MB PC POWERED	478.65
BERNOULLI 150MB TRANSPORTABLE	579.26
BERNOULLI 150MB INSIDER IDE NEW	489.89

SUMMIT

SE120 120MB INT TAPE B-U	139.96
SE250 250MB INT TAPE B-U	174.63
SE305 305MB INT TAPE B-U	269.90

MICROSOLUTIONS

BACKPACK 3.5" 1.44MB FLOPPY PARALLEL	177.84
BACKPACK 5.25" 1.2MB FLOPPY PARALLEL	177.84
BACKPACK 170MB HD PARALLEL	379.59
BACKPACK 200MB HD PARALLEL	434.59
BACKPACK CD-ROM PARALLEL	357.91
BACKPACK 250MB TAPE B-U PARALLEL	359.05

TAPE, REMOVABLE & FLOPPY DRIVES

SyDOS

PRO NOTE 42MB PARALLEL	519.50
PUMA 88MB PARALLEL	442.44
MARLIN 105MB INT IDE	529.87
88MB EXT SCSI W/ADPT	409.27

Mountain

TD-250 250MB INT IDE	189.32
FS8500 305MB INT IDE	449.50
1200-4 4GB EXT SCSI	2019.93

WYSE TERMINALS

WYSE 30 AMBER OR GREEN	272.89
WYSE 50 AMBER OR GREEN	355.50
WYSE 60 AMBER, GREEN, WHITE	279.60
WYSE 150 AMBER, GREEN, WHITE	265.45
WYSE 160 AMBER, GREEN, WHITE	329.88
WYSE 325 COLOR	519.40

MULTIMEDIA, SOUND, CD

ALTEC LANSING ACS300 SPKRS/SW	274.26
CDW 5 CD BUNDLE	129.00
CDW 5 CD BUSINESS BUNDLE	119.86
CDW 5 CD ENTERTAINMENT BUNDLE	79.33
CDW 4 CD EDUTAINMENT BUNDLE	65.16
CREATIVE LABS DISCOVERY 16 INT	439.81
CREATIVE LABS MULTIMEDIA STARTER INT	449.58
CREATIVE LABS SOUND BLASTER PRO	117.97
CREATIVE LABS SOUND BLASTER 16 ASP	199.00
MEDIAVISION PRO AUDIO SPECTRUM 16	159.64
MEDIAVISION PRO AUDIO STUDIO 16	214.30
MEDIAVISION PRO 16 SYSTEM II BUNDLE	847.97
MICROSOFT MULTIMEDIA BEETHOVEN	54.88
MICROSOFT CINEMANIA	54.88
MICROSOFT BOCKSHELF CD	119.89
MICROSOFT WIN SND SYS V2.0	52.95
MS WIN SND SYS V2.0 W/BOARD	145.15
ORCHID SOUNDWAVE 32	219.72
ORCHID GAMEWAVE 32	149.90
PROCOM INT MULTIMEDIA STATION	739.16
PROCOM EXT MULTIMEDIA STATION	789.45
SONY DSKTOP LIBRARY INT	267.97
SONY DSKTOP LIBRARY INT W/SND	469.89
SONY DSKTOP LIBRARY EXT W/SND	546.74
TURTLE BEACH MULTISOUND	513.97

CD-ROM & OPTICAL DRIVES

CHINON CDS535 INT CD-ROM KIT	388.45
CHINON CDX535 EXT CDROM KIT	449.90
ACCULOGIC PARALLEL PORT CD-ROM	499.50
HITACHI 1900S EXT CD-ROM	499.85
HITACHI CDR1950 EXT	512.50
HITACHI 6700 INT CD-ROM	409.85
HITACHI CDR6750 INT	412.51
NEC CDR74-1 EXTERNAL CD-ROM	399.50
NEC 3XI INTERNAL NEW	479.90
NEC 3XE EXTERNAL NEW	569.90
NEC 3Xp Portable NEW	439.90
ORCHID CDS3110 INT	232.63
PIONEER DRM604X 6 DISC QUADRASPIN	1347.42
PROCOM 200MS INT SCSI CD-ROM	452.09
PROCOM 200MS EXT SCSI CD-ROM	557.65
SONY CDU535 INT CD-ROM	279.63
SONY CDU54101 INT SCSI CD-ROM	349.15
SONY CDU7205N EXT CD-ROM	463.19
SYDOS PARALLEL PORT CD-ROM	299.51
TEXEL 3028 240MS INT KIT	CALL
TEXEL 3028 W/PA SPECTRUM 16	CALL
TEXEL 5028 240MS EXT KIT	CALL
TEXEL 5028 W/PA SPECTRUM 16	CALL
TOSHIBA 3401 INT SCSI CD-ROM	397.97
TOSHIBA 3401 INT SCSI CD-ROM W/ADPT	549.14
TOSHIBA 3401 EXT SCSI CD-ROM	515.95
TOSHIBA 3401 EXT SCSI CD-ROM W/ADPT	649.55
TOSHIBA 3401 EXT SCSI 4 DRIVE TOWER	2535.08

PLOTTERS, DIGITIZERS & SCANNERS

HURTA

IS/ONE 12 X 12 4 BUTTON	309.25
IS/ONE 12 X 12 12 BUTTON	309.95
XLP 12 X 12 4 BUTTON & STYLUS	225.50
XLP 12 X 18 16 BUTTON	454.68
XGT 12 X 12	399.90

CalComp

DB III 12X12 4 BUTTON	304.84
DB III 12X12 16 BUTTON	304.84
DB III 12X18 16 BUTTON	399.85
12 X 12 4 BUTTON CORDLESS	279.89
12 X 12 16 BUTTON	395.90
12 X 18 16 BUTTON	472.15
24 X 36 16 BUTTON	1352.38

Summagraphics

SUMMASKETCH III 12 X 12 4 BUTTON	259.90
SUMMASKETCH III 12 X 12 16 BUTTON	259.90
SUMMASKETCH III 18 X 12 4 BUTTON	524.44

HOUSTON INSTRUMENT

HI 7100 A-D SIZE 8 PEN	2846.55
HI 7200 A-F SIZE 8 PEN	3469.12

HEWLETT PACKARD

HP SCANJET IIP	733.48
HP SCANJET IIP DOCUMENT FEEDER	269.93
HP SCANJET IICX W/ ISA NEW	998.50
HP SCANJET IICX DOCUMENT FEEDER	474.72

EPSON

ACTICNSCANNER ES600C	798.86
ES800C PARALLEL/SCSI	1089.81
ACTIONSCANNER ES800C	1077.29
ACTIONSCANNER ES800C PRO	1241.53

VIDEO PRODUCTS

VGA & SUPER VGA MONITORS

AST VISION 4N 14"	369.91
AST VISION 4L 14"	399.95
MAG INNOVISION MX15F	517.97
MAG INNOVISION MX17F	899.50
MAGNAVOX CM2079 14" .39	239.20
MAGNAVOX CM2089 14" .28	279.90
MAGNAVOX CM9217 17"	599.50
MAGANAVOX 20CM64 20"	1169.88
NANAO F340IW 15"	719.83
NANAO F550I 17"	1059.25
NANAO F550IW 17"	1159.45
NEC 3V 15"	519.00
NEC 3FGE 15"	589.00
NEC 4FGE 15"	699.00
NEC 5FGE 17"	1077.00
NEC 5FGp 17"	1358.59
NEC 6FGp 21"	2368.94
PANASONIC C13811 14"	325.76
PHILIPS 1557AS 15"	489.89
PHILIPS 1764DC 17"	799.50
SONY CPD1430 14"	599.50
SONY CPD1730 17"	1049.15

VGA & SUPER VGA DISPLAY CARDS

ACTIX ULTRA PLUS 1MB	235.90
ACTIX ULTRA PLUS 2MB	304.85
ADS VGA TO TV ELITE	259.00
ATI GRAPHICS ULTRA+ 2MB	237.97
ATI GRAPHICS ULTRA PRO 2MB	357.62
ATI GRAPHICS ULTRA PRO 2MB EISA	394.92
ATI VGA WONDER XL24	119.32
CREATIVE LABS VIDEO BLASTER	339.02
CREATIVE LABS VIDEO SPIGOT	337.97
DIAMOND STEALTH PRO 1MB	249.83
DIAMOND STEALTH PRO 2MB	339.61
DIAMOND SPEEDSTAR PRO 1MB	109.00
DIAMOND VIPER VLB 2MB	398.49
HERCULES GRAPHITE 1MB	329.72
HERCULES GRAPHITE 2MB	374.55
HERCULES DYNAMITE VLB	159.00
INTEL SMART VIDEO RECORDER	486.88
ORCHID FAHRENHEIT 1280+	154.97
ORCHID FAHRENHEIT VA	177.97
ORCHID FAHRENHEIT VA/VLB	209.45
ORCHID CELSIUS VLB 1MB	238.97
ORCHID CELSIUS VLB 2MB	299.79
STB HORIZON VL 1MB	126.74

If You Find a Better Price, Call CDW® Before You Buy (800) 998-4CDW

NASDAQ

BUY WITH CONFIDENCE
CDW® IS A NASDAQ TRADED COMPANY
TICKER SYMBOL CDWC
D & B Rated 4A1
Duns 10-762-7952

No Surcharge For Credit Cards

VISA DISCOVER

Credit Card charges are not submitted until time of shipment. Freight is calculated as the carrier's actual freight charge plus insurance and packaging material. The cost of insurance is 2.50% (3.20% of the order total. Packaging materials will not exceed $4.00 per 1 package order or $8.00 per multi-package shipment. For your protection we ship only to your verified billing address. Non-defective returns subject to restocking fee. Allow 10 business days for shipping when paying by personal check. Software, drugs and other electronic components are not returnable. All pricing subject to change. ™ - Trademarks of all companies listed in this ad.

CDW® HOURS

Sales 7:30-7:30 CDT Mon-Fri.
9:00-5:00 CDT Sat.
Tech Support for Customers
8:00-7:00 CDT Mon-Fri.
9:00-5:00 CDT Sat.

MOST ORDERS SHIP THE SAME DAY

OMPUTER DISCOUNT WAREHOUSE™

CDW

IS Robotics /oridPort 4,400 BPS ocket Modems

SPECIAL PURCHASE!

14.4K BPS Data, V.32bis
otocol ✔ Fax Model Adds
4K BPS Send/Receive Fax
V.42 Error Correction
V.42bis Data Compression
LED Status Indicators ✔ 9V
ttery Powered, AC Adapter
luded ✔ Complete Software Included ✔ While Supplies Last

.4K Data..... **$159.00** CDW 27097
.4K Data/Fax..... **$169.00** CDW 26535

WHY SETTLE FOR LESS?

CDW® SERVICES YOU BETTER

CANON BJC-600

NEW!

Color Bubblejet Printer

✓ 360 dpi ✓ 240 cps
✓ Individual Color Cartridge System: Less Waste
✓ 100 Sheet Feeder
✓ Laser Quality Text
✓ Optimized for Plain Paper Vibrant Colors Without Special Paper

Canon

CDW® Price..... ONLY **$588.50** CDW 32009

CDW® CARRIES OVER 15,000 PRODUCTS. IF YOU DON'T SEE IT, CALL!

COMPUTERS

TOSHIBA

00/120MB	1499.00	T1950CT/200MB	2999.00
00/200MB	1669.00	T1950CT/320MB	3399.00
00C/120MB	2049.00	T4600/120MB	2289.00
00C/200MB	2239.00	T4600/200MB	2499.00
50/120MB	1899.00	T4600C/120MB	3869.00
50C/120MB	2479.00	T4600C/200MB	3999.00
50CT/120MB	2799.00	T4600C/340MB	4369.00
50/200MB	2099.00	T6600C/510MB	5099.00
50C/200MB	2699.00		
00C/510MB CD			6599.00
00C/510MB CD/DVI			7599.00
W T3400 Subnotebook!			CALL
W T4700C i486DX2/50!			CALL

AST

4/25S/4/33S 120MB,4MB	997.97/1119.97
4/33D 120MB,4MB/210MB,8MB	1257.97/1497.97
4/50D 120MB,4MB/210MB,8MB	1527.97/1767.97
4/66D 120MB,4MB/210MB,8MB	1787.97/1997.97
4/25S 170MB,4MB/340MB,8MB	1177.97/1599.35
4/33D 170MB,4MB/340MB,8MB	1445.60/1689.77
4/66D 170MB,4MB/340MB,8MB	1954.52/2394.91
4/33D 170MB,4MB/340MB,8MB	1497.97/1927.97
4/66D 170MB,4MB/340MB,8MB	1997.97/2467.97
TEBOOK 80MB MONO	1657.97
TEBOOK 120MB MONO/COLOR	1767.97/2449.88
TEBOOK 170MB MONO/COLOR	1867.97/2527.97
TEBOOK 170MB COLOR+	3297.97
WEREXEC 4/25 200MB MONO SPECIAL	2409.48
WEREXEC 4/25 200MB COLOR SPECIAL	3959.84

ACER

ROS 4/25S 170MB	999.97
ROS 4/33D 170MB	1259.95
ROS 4/33D 240MB	1309.89
ROS 4/50DX2 170MB	1349.88
ROS 4/50DX2 340MB	1398.88

Canon

TEJET 4/25 135MB	2307.87
TEJET 4/25 180MB	2597.10
OVA 4/33L SX 170MB	987.92
OVA 4/33L SX 240MB	1078.46
OVA 4/50L 170MB	1379.90
OVA 4/50L 240MB	1459.96
OVA 4/66L 170MB	1530.57
OVA 4/66L 240MB	1614.68

NEC VERSA NOTEBOOKS

5 120MB COLOR	3687.97
5 180MB MONO	2925.22
5 180MB COLOR	4016.22
3 180MB MONO	3178.22
3 180MB COLOR	4238.56
3 180MB COLOR OFFICE	4499.12
3 250MB MONO	3499.00
3 250MB COLOR	4499.00
ADY ES 4/25 170MB	997.97
ADY 4/25S 170MB Multimedia	1447.97
WERMATE ES 4/25 170MB	1069.79
ADY ES 4/33S 210MB	1247.97
WERMATE ES 4/33 170MB	1399.97
WERMATE ES 4/66 170MB	1699.93
ADY 4/33S 210MB Multimedia	1899.89
ADY ES 4/66 250MB	1697.97

TEXAS INSTRUMENTS

4000E 4/25D 120MB MONO	1877.97
4000 4/25D 200MB MONO	2177.97
4000E 4/25S 120MB ADV COLOR	2097.97
4000 4/40 200MB PASSIVE COLOR	2979.97
4000 4/50 120MB MONO	2527.97
4000E 4/50 200MB MONO NEW!	2697.97
4000E 4/50 200MB DUAL COLOR	3289.97
4000E 4/50 200MB ACTIVE COLOR	3797.97

DOT MATRIX & LASER PRINTERS

OKIDATA

TURBO	218.14	ML590	424.51
320	304.45	ML591	585.87
321	432.43	PACEMARK 3410	1222.92
380	214.95	OL400E	499.98
395	989.20	OL810	905.50
395C	1039.74	OL830+	1079.95
520	369.82	OL850	1195.20
521	499.18	DOC-IT 4000	2909.49

Canon

0SX NEW	259.89
00+	259.90
30+	369.98
600 COLOR	588.50
P430 LASER	588.50

ter $30 Manufacturer's Rebate

DOT MATRIX & LASER PRINTERS

EPSON

AP2250	115.63	LQ870	445.50
AP3250	173.15	LQ1170	615.55
AP3260	209.00	LQ2550	899.00
LX810	167.97	DFX5000	1357.97
FX870	269.99	DFX8000	2277.97
FX1170	355.95	STYLUS 300	229.95
LQ570+	237.97	STYLUS 800	319.90
LQ1070+	365.35		
ACTION LASER 1500			646.97
ACTION LASER 1500 W/2MB			699.90

NEC

P3200	231.99	Silentwriter 95FX	1095.95
Jetmate 1000	279.88	SilentwriteR 97	1075.72
SuperScript 610 NEW	635.85	Silentwriter 1097 NEW	1389.01
Silentwriter 95F	879.33		

Panasonic

1150	133.48	2180	163.91
1624	379.20	2624	399.89
1695	398.44	4410 LASER	529.60
2023	202.97	4430 LASER	669.88
2123	243.37	4440 LASER	1199.40
2124	318.41		

TEXAS INSTRUMENTS

MICROWRITER BASIC/PS35	518.35/677.97		
MICROLASER PRO 600 PS23 NEW*	1329.82		
MICROWRITER PS65	937.97		
MICROLASER PRO 600 PS65 NEW	1549.25		
MICROMARC INKJET	277.97		

*After $60 Manufacturer Rebate

HEWLETT PACKARD

Deskjet Port 310	399.80	LaserJet 4L	689.97
Deskjet 500	319.89	LaserJet 4P NEW	999.99
Deskjet 500C	399.50	LaserJet 4MP NEW	1469.89
Deskjet 550C	598.12	LaserJet 4	1389.46
Deskjet 1200C	1399.86	LaserJet 4M	1948.64
Deskjet 1200C PS	1928.96	LaserJet 4SI	2968.95

IBM LEXMARK

4037 5E 5PPM NEW	657.97
4029-10 10PPM	1117.97
4039-10R 10PPM	1347.97
4039-10RD 10PPM DUPLEX	1847.97
4039-12R 12PPM	1697.97
4039-12L 12PPM	2447.97
4039-16L 16PPM	2744.87

HARD DRIVES & CONTROLLERS

Maxtor

131MB IDE	178.95	345MB SCSI	359.13
13MB IDE	219.95	540MB IDE	699.00
245MB IDE	239.95	1.02GB SCSI	976.86
245MB SCSI	258.95	1.24GB SCSI	1249.47
345MB IDE	299.18		

MICROPOLIS

2210A 1050MB IDE	969.89	1548.2GB SCSI	1327.43
2210 1050MB SCSI	979.68	1936.3GB SCSI	2399.25
2217 1.7GB SCSI	1309.49		

CONNER

84MB IDE	167.76	340MB IDE	319.99
174MB IDE	199.99	540MB IDE	619.35
210MB IDE	228.24	540MB SCSI	629.35
250MB IDE	228.95	37GB SCSI	1068.20

Seagate

42MB MFM	239.84	261MB IDE	244.50
42MB IDE	116.04	341MB IDE	328.50
106MB IDE	177.94	452MB IDE	439.80
130MB IDE	168.95	766MB ESDI	989.80
200MB IDE	208.95	1.05GB SCSI	964.07

CONTROLLERS

ACCULOGIC IDE	23.65
ACCULOGIC IDE W/1PAR, 2SER, 1GAME	35.06
ACCULOGIC IDE W/BIOS	48.90
ACCULOGIC ISA SCSI-2	129.29
ACCULOGIC EISA SCSI-2	349.68
ADAPTEC 1522 SCSI KIT	139.58
ADAPTEC 1542CF SCSI KIT	259.45

MODEMS & COMMUNICATIONS

US Robotics SPORTSTER MODEMS

14.4 INT	149.50
14.4 INT W/FAX	149.50
14.4 EXT	169.50
14.4 EXT W/FAX	179.50
WORLDPORT 14.4/W/FAX	159.00/169.00

COURIER MODEMS

V.32TERBO INT	417.97
V.32TERBO INT W/FAX	428.50
V.32TERBO EXT	467.97
V.32TERBO EXT W/FAX	487.97
16.8 HST EXT	477.25
DUAL STD INT W/FAX	663.19
DUAL STD TERBO INT/EXT W/FAX	769.90/849.90

Hayes

ACCURA 2400B INT	59.10	OPTIMA 24 FAX	119.34
ACCURA 2400 EXT	69.25	OPTIMA 9600 EXT	338.50
ACCURA 24EC FAX	94.89	OPTIMA 96 FAX	354.42
ACCURA 96 FAX	175.12	OPTIMA 14.4 EXT	363.80
ACCURA 96 EXT	199.68	OPTIMA 14.4FAX	378.30
ACCURA 14.4 FAX	195.88	OPTIMA 14.4Pocket	296.93
ACCURA 14.4 EXT	219.46	ULTRA 9600 EXT	569.18
OPTIMA 2400	112.64	ULTRA 14.4 EXT	629.56

PRACTICAL PERIPHERALS

2400B INT	61.66
2400 EXT	69.95
PM2400EFX 2400 V.42 INT W/FAX	89.65
PM2400EF 2400 V.42 EXT W/FAX	109.56
PM2400FP 2400 POCKET W/FAX	106.56
PM9600FX 9600 INT W/FAX	174.30
PM9600FXMT 9600 EXT W/FAX	183.20
PM14400FX 14.4 INT W/FAX	185.20
PM14400FXMT 14.4 EXT W/FAX	197.28
PM14400FXSA 14.4 EXT W/FAX, LCD	274.45
PM14400FXP 14.4 POCKET W/FAX	339.95

intel SATISFAXTION MODEMS

100 INT	95.51	350 INT	259.95
200 INT	209.50	400 INT	269.52
300 INT	228.22	400E EXT	309.55
2400 V.42BIS INT			132.67
2400 V.42BIS EXT			149.96
9600 INT W/FAX			155.76
14.4 INT W/FAX			173.47
14.4 EXT W/FAX			197.28

BOCA

BOCA 14.4K INT W/FAX	119.55
BOCA 14.4K EXT W/FAX	149.85

BATTERY BACKUP AND UPS

BC250	99.11	OMNI 500 LAN	269.31
BC400	146.89	OMNI 600 LAN	309.89
BC500	191.42	OMNI 750 LAN	399.86
BC500 LAN	199.49	OMNI 1250 LAN	599.03
BC600 LAN	239.50	UNISON 600	499.95
BC750 LAN	313.90	LC1200	145.77
BC900 LAN	359.67	LC1800	192.49
BC1250 LAN	449.59		
LAP POWER AC/DC INVERTER			59.23

AMERICAN POWER

BACK UPS 250	99.34	SMART UPS 400	299.95
BACK UPS 400	159.63	SMART UPS 600	363.38
BACK UPS 450	189.81	SMART UPS 900	569.55
BACK UPS 600	264.84	SMART UPS 900XL	1118.04
BACK UPS 900	374.14	SMART UPS 1250	709.87
BACK UPS 1250	498.77	SMART UPS 2000	1188.00
SURGEARREST PLUS			29.97
SURGEARREST PLUS W/TEL			54.88
LINE-R 600			119.09

MICE

LOGITECH DEXXA SERIAL MOUSE	27.37
LOGITECH MOUSEMAN COMBO	49.81
LOGITECH MOUSEMAN CORDLESS	89.93
LOGITECH TRACKMAN PORTABLE	72.50
LOGITECH FOTOMAN PLUS	549.76
MICROSOFT MOUSE V2.0 SERIAL*	59.00
MICROSOFT MOUSE V2.0 PS/2*	59.00
MICROSOFT MOUSE V2.0 W/WIN3.1 COMBO	149.96
MICROSOFT BALLPOINT V2.0	152.77
MICROSOFT BALLPOINT MOUSE W/WIN 3.1	144.48

* SPECIAL THROUGH 11/30/93

PCMCIA

HAYES PCMCIA OPTIMA 9600 W/FAX	235.56
HAYES PCMCIA OPTIMA 14.4 W/FAX	359.98
IBM PCMCIA TOKEN RING 16/4	499.79
INTEL PCMCIA 2400 W/FAX	185.14
INTEL PCMCIA 9600 W/FAX	243.10
INTEL PCMCIA 14.4 W/FAX	289.54
LINKSYS PCMCIA ETHERNET COAX	197.91
LINKSYS PCMCIA ETHERNET 10BT	197.91
MEGAHERTZ PCMCIA 2400 W/FAX	189.95
MEGAHERTZ PCMCIA 2400 XJACK W/FAX	197.97
MEGAHERTZ PCMCIA 9600 W/FAX	259.90
MEGAHERTZ PCMCIA 9600 XJACK W/FAX	277.97
MEGAHERTZ PCMCIA 14.4 W/FAX	299.20
MEGAHERTZ PCMCIA 14.4 XJACK W/FAX	327.97
NOVELL EAGLE PCMCIA ETHERNET COAX	242.80
PRACTICAL PCMCIA 14.4 W/FAX	369.97
T. CONRAD PCMCIA ETHERNET COAX	289.88
USR WORLDPORT PCMCIA 2400 W/FAX	284.60
USR WORLDPORT PCMCIA 14.4 W/FAX	309.88
XIRCOM PCMCIA ETHERNET COAX	276.80
XIRCOM PCMCIA ETHERNET 10BT	269.92
XIRCOM PCMCIA ETHERNET COMBO	309.55

MEMORY UPGRADES

CDW® Features Delkin, Kingston, Pacific Data and Simple Technology Memory.

AST BRAVO 486LC 2MB	CALL
AST POWEREXEC 486 4MB	CALL
AST PREMIUM II 1MB CUPID SIMM	CALL
AST PREMMIA 8MB UPG	CALL
COMPAQ DESKPRO 8MB	CALL
COMPAQ CONTURA 486 8MB	CALL
COMPAQ CONTURA 4MB	CALL
COMPAQ DP 386/16 4MB	CALL
COMPAQ LITE 4/25C 4MB	CALL
COMPAQ PRCLINEA 486/33 4MB	CALL
COMPAQ PRCSIGNIA 16MB	CALL
EPSON ACTION LASER 2-8MB	CALL
HP DESKJET 500 & 500C 256KB	CALL
HP LASER 4L 1MB MEM UPG	CALL
HP LASERJET 2P/III 2MB	CALL
HP LASERJET 3SI 4MB	CALL
HP LASERJET 4 4MB	CALL
HP PAINTJET XL300 4MB	CALL
IBM DESKTOPS-ALL MODELS	CALL
IBM THINKPAD 700 4MB	CALL
NEC SILENTWRITER 95 2MB	CALL
NEC VERSA 4MB	CALL
OKILASER 400 2MB	CALL
OKILASER 800 2MB	CALL
PANASONIC 4410, 4430 2-4MB	CALL
PANASONIC P4450I 2MB	CALL
TI MICROLASER 1MB	CALL
TI TM4000 4MB	CALL
TOSHIBA 1800, 1850, 2000SX/E, 2200SX 2MB	CALL
TOSHIBA 1800,1850, 2000SX/E, 2200SX 4MB	CALL
TOSHIBA 1900C,4500C,4600C 8MB	CALL
TOSHIBA 4400, 4400SX/C 4MB	CALL
TOSHIBA T1800, 1850, 2000SX/E 2200SX 8MB	CALL

Due to an Industry-Wide Memory Shortage, Please Call CDW for the Best, Most Current Pricing and Availability Information.

PROCESSOR/UPGRADES

CYRIX 486DRX/2 UPGRADE	299.29
INTEL OVERDRIVE 16/20MHZ	299.44
INTEL OVERDRIVE 25MHZ	369.20
INTEL OVERDRIVE 33MHZ	529.55
KINGSTON SX/NOW 25MHZ	169.45
KINGSTON SX/NOW 33MHZ	196.25
KINGSTON 486/NOW 25MHZ	329.76
KINGSTON 486/NOW 33MHZ	519.25

MATH COPROCESSORS

INTEL 287XL	84.80
INTEL 387SX 16/20/25MHZ	78.95
INTEL 387SX 33MHZ	91.20
INTEL 387SL	78.95
INTEL 387DX	84.95
INTEL RAPIDCAD	239.10

COMPUTER DISCOUNT WAREHOUSE™

NEW! Lease Option Call for Details

CDW® Sells for Less and Services You Better!

(800) 359-4CDW

FAX (708) 291-1737

©1994 CDW® Computer Centers, Inc. WOR811

CALL FOR FREE CDW® CATALOG

Circle 68 on reader service card

FREE Product Information INSTANTLY - BY FAX

1. Call **1-800-234-0455**
2. Enter the 3-digit extension that corresponds to the company you want to receive information from
3. Enter fax number

Get Information INSTANTLY From:

ATI Technologies
Graphics Cards
ext. 130

Acma Computers
Personal Computers
ext. 115

QMS
Laser Printers
ext. 158

Rose Electronics
Printer Sharing & Networking Peripherals
ext. 145

Software Publishing Corporation
Harvard Graphics
Presentation Software
ext. 195

ALSO AVAILABLE FREE:

Catalog of PC World Articles
enter ext. **265** to receive

Catalog of PC World Instant Reference Cards
enter ext. **965** to receive

PC WORLD

PC WORLD

PUBLISHER Richard J. Marino
Assistant to the Publisher Colette Cornish

ADVERTISING SALES

Vice President, Director of Advertising
Jeff Edman

Assistant to the the Vice President, Director of Advertising Patricia Owen

Marketshare Coordinator
Kate Comfort Harr

EAST

Eastern Advertising Director
Bob Ostrow (508/820-0440)

Administrative Assistant/Office Manager
Ellen Sanderson

Mid-Atlantic/Manhattan
John Grogan, Senior Account Manager (201/587-0090)

Wayne Silverman, Account Representative (201/587-0090)

New England/Ohio/Michigan/ Eastern Canada
Michael Welsh Carroll, Account Manager (508/820-0440)

Southeast/Pennsylvania
Judy Sutter, Senior Account Manager (404/394-0758)

MIDWEST

Midwest Advertising Director
Mark Taussig (708/827-4477)

Administrative Assistant
Tammy Torp

Midwest/Texas
Harvey Diamond, Senior Account Manager, National Direct Account Manager (214/233-3492)

Midwest
Duane Hampson, Account Representative (415/243-0500)

NORTHWEST

Northwestern Advertising Director
Bob Carrigan (415/243-0500)

Administrative Assistant
Jane Basco

Northern California
Corinne Cox, Account Manager (415/243-0500)

San Jose, California
Susan Simmons, Senior Account Manager, Director of Strategic Markets (415/243-0500)

SOUTHWEST

Southwestern Advertising Director
Greg Mason (415/243-0500)

Administrative Assistant
Casady Rutter

Southern California, (San Diego) Colorado/Idaho/Nevada/Utah/ New Mexico/Arizona
Lisa Crutchfield, Account Manager (714/250-8081)

Southern California (Los Angeles County/ Orange County)
Bill Hanck, Account Manager (310/312-8008)

West
Sandie Wade, Account Representative (415/243-0500)

LOTUS EDITION ADVERTISING SALES

Kevin Normandeau, Account Representative (508/820-8113)

PC WORLD CLASSIFIED

Classified Manager
Pat Fales (203/857-5115)

Eastern Account Manager
Chris Kimball (203/857-5101)

Western Account Manager
Janet Sawyer (203/857-5102)

PC WORLD ACTION CARDS

Account Representatives
Kevin Normandeau (508/820-8113)
Leslie Piper (415/243-0500)

PC WORLD REPRINTS

Reprints Coordinator
Leslie Piper (415/243-0500)

CIRCULATION, MARKETING, RESEARCH

Senior Vice President
Heather Martin Maier

Circulation Business Manager Noël White

Senior Promotion Manager
Francesca Davies

Promotion Manager Ellen DiMatteo

Promotion Coordinator Jane Kratochvil

Renewal and Billing Coordinator
David Cobb

Circulation Assistant Katherine McCarthy

Subscriber Service Chris Browning

Single Copy Sales Manager Cheryl Grover

Director of Marketing Alan Abrams

Public Relations Manager Lee Doyle

Marketing Events Manager Sandy Wong

Administrative Assistant Krista Alvarez

Research Director Cheryl Curbow

Research Manager Thomas Gewecke

Sr. Research Analyst Scott Laughlin

Research Analyst Kate Collins

PRODUCTION

Vice President, Manufacturing
Linda Manes Goodwin

Senior Production Manager
Nadia Maudsley

Advertising Information Manager
Mike Wallace

Assistant Production Manager
Kathy Badertscher

Advertising Production Coordinator
Francis Aviani

Production Coordinator Nancy Jonathans

Advertising Information Assistant
Erin Wayman

HUMAN RESOURCES

Director, Human Resources
Richard Willoughby

Administrator, Human Resources
Thalia Ohara

Human Resources Assistant Maria Chico

ADMINISTRATION

Director of Finance Vicki Peilen

Director of Information Systems
Wally Clegg

Information Systems Manager
Norman Noble

Corporate Business Manager
Christina Spence

Accounting/Operations Manager
Pat Murphy

Accounting/Facilities Manager
Michelle Reyes

Senior Financial Analyst
Madeleine Buckingham

Special Assistants to the President
Pete Deemer, Melissa Riofrio, Zornitza Stefanova

Assistant to the President Kelly Milan

Advertiser Index A-Z

Get more information–circle the appropriate number on the reader service card.

Reader Service Number		Page Number
66	Acma Computers	33
9	Advanced Logic Research	18
31	All Micro	294A
162	Ambra	2-3
127	Ambra	126-129
45	American Power Conversion	231
–	Anthro Corp.	24
8	Arlington Computer Products	287
–	AST Research	22-23
20	Austin Computer Syst	100-101
32	Austin Computers	167-169
63	Borland	35
52	Central Point Software	209
–	Chipsoft Inc	137
83	Compaq Direct	99
83	Compaq Direct	96-97
35	Compaq Direct Plus	117
47	Compaq Direct Plus	255
14	CompUSA	246-247
33	Compuserve Inc.	165
42	Computer Associates	91
39	Computer Associates	265
78	Computer Associates	14
68	Computer Discount Warehouse	290-293
65	Comtrade	300
93	Corel	21
56	Cougar Mountain Software	294H
54	Creative Labs	237
7	Creative Labs	232-233
–	Curtis Manufacturing	29
92	Cyrix Corp	216-217
–	Dell Computers	C5-C8
171	Delrina Technology	88
–	Digital Equipment Co	93-95
125	Diskette Connection	294B
–	Epson America Inc	118-119
–	Gateway 2000	44-69
–	Gateway 2000	45-69
107	Ge Information Service	111
107	Ge Information Service	113-115
105	Hayes Microcomputer	26
90	Helix Software	259
–	Hewlett Packard	36-37
–	Hewlett Packard	82-83
–	IBM Corp.	121

PC World is a publication of International Data Group, the world's largest publisher of computer-related information and the leading global provider of information services on information technology. International Data Group publishes over 190 computer publications in 62 countries. Forty million people read one or more International Data Group publications each month. International Data Group's publications include: **ARGENTINA's** Computerworld Argentina, Infoworld Argentina; **ASIA's** Computerworld Hong Kong, Computerworld Malaysia, Computerworld Southeast Asia, PC World Hong Kong, PC World Malaysia, PC World Singapore; **AUSTRALIA's** Australian Macworld, Australian PC World, Computerworld Australia, IDG Sources, Network World, Reseller; **AUSTRIA's** Computerwelt Oesterreich, PC Test; **BRAZIL's** Computerworld, Mundo IBM, Mundo Unix, PC World, Publish; **BULGARIA's** Computerworld Bulgaria, Ediworld, PC & Mac World Bulgaria; **CANADA's** Direct Access, Graduate Computerworld, InfoCanada, Network World Canada; **CHILE's** Computerworld, Informática; **COLOMBIA's** Computerworld Colombia; **CZECH REPUBLIC's** Computerworld, Elektronika, PC World; **DENMARK's** CAD/CAM World, Communications World, Computerworld Danmark, Lotus World, Macintosh Produktkatalog, Macworld Danmark, PC World Danmark, PC World Produktguide, Windows World; **ECUADOR's** PC World; **EGYPT's** Computer World (CW) Middle East, PC World Middle East; **FINLAND's** MikroPC, Tietoverkko, Tietoviikko; **FRANCE's** Distributique, Golden Mac, InfoPC, Languages & Systems, Le Guide du Monde Informatique, Le Monde Informatique, Télécoms & Reseaux; **GERMANY's** Computerwoche, Computerwoche Extra, Computerwoche Focus, Computerwoche Karriere, Information Management, Macwelt, Netzwelt, PC Welt, PC Woche, Publish, Unit; **HUNGARY's** Alaplap, Computerworld SZT, PC World; **INDIA's** Computers & Communications; **ISRAEL's** Computerworld Israel, PC World Israel; **ITALY's** Computerworld Italia, Lotus Magazine, Macworld Italia, Networking Italia, PC World Italia; **JAPAN's** Computerworld Japan, Macworld Japan, SunWorld Japan, Windows World; **KENYA's** East African Computer News; **KOREA's** Computerworld Korea, Macworld Korea, PC World Korea; **MEXICO's** Compu Edicion, Compu Manufactura, Computacion/Punto de Venta, Computerworld Mexico, MacWorld, Mundo Unix, PC World, Windows; **THE NETHERLANDS'** Computer! Totaal, LAN Magazine, MacWorld; **NEW ZEALAND's** Computer Listings, Computerworld New Zealand, New Zealand PC World; **NIGERIA's** PC World Africa; **NORWAY's** Computerworld Norge, C/World, IDG Direct Response, Lotusworld Norge, Macworld Norge, Networld, PC World Ekspress, PC World Norge, PC World's Product Guide, Publish World, Student Data, Unix World, Windowsworld; **PANAMA's** PC World; **PEOPLE'S REPUBLIC OF CHINA's** China Computerworld, China Network World, Electronics International, PC World China; **IDG HIGH TECH BEIJING's** New Product World; **IDG SHENZHEN's** Computer News Digest; **PERU's** Computerworld Peru, PC World; **PHILIPPINES'** Computerworld, PC World; **POLAND's** Computerworld Poland, PC World/Komputer; **PORTUGAL's** Cerebro/PC World, Correio Informatico/Computerworld, MacIn; **ROMANIA's** PC World; **RUSSIA's** Computerworld-Moscow, Mir-PC, Sety; **SLOVENIA's** Monitor Magazine; **SOUTH AFRICA's** Computing S.A.; **SPAIN's** Amiga World, Computerworld España, Comunicaciones World, Macworld España, NeXTworld, PC World España, Publish, Sunworld; **SWEDEN's** Attack, ComputerSweden, Corporate Computing, Datalngenjoren, Lokala Natverk/LAN, Lotus World, MAC&PC, Macworld, Maxi Data, Mikrodatorn, PC World, Publishing & Design (CAP), Windows World; **SWITZERLAND's** Computerworld Schweiz, Macworld Schweiz, PC & Workstation; **TAIWAN's** Computerworld Taiwan, Global Computer Express, PC World Taiwan; **THAILAND's** Thai Computerworld; **TURKEY's** Computerworld Monitor, Macworld Turkiye, PC World Turkiye; **UKRAINE's** Computer World; **UNITED KINGDOM's** Lotus Magazine, Macworld, Sunworld; **UNITED STATES'** AmigaWorld, Cable in the Classroom, CD Review, CIO, Computerworld, Desktop Video World, DOS Resource Guide, Electronic News, Federal Computer Week, Federal Integrator, GamePro, IDG Books, Infoworld, Infoworld Direct, Laser Event, Macworld, Multimedia World, Network World, NeXTworld, PC Games, PC Letter, PC World, Publish, Sumeria, SunWorld, SWATPro, Video Event; **VENEZUELA's** Computerworld Venezuela, MicroComputerworld Venezuela; **VIETNAM's** PC World Vietnam.

Index

Reader Service Number		Page Number
142	IBM PC Company	10
–	**IDG Books**	238-239
149	Information Synthesis	103
116	Inmac	105-108
131	Insight Direct	294D
109	Intel Corp	86-87
–	Intuit	137
223	Key Tronic	181
118	Kinesis Corporation	242
–	L A Trade	288
206	Learnkey, Inc.	284-285
122	Logitech Inc	241
–	Lotus - Smart Suite	77-79
–	Lotus 1-2-3	16-17
126	Lyco Computers	275
151	Mag Innovision	40
166	Media Age	280-283
22	Media Magic	38
167	Media Vision	278
165	MEI Micro Center	41
157	Micro Express	147,149
–	Microsoft	229
–	Microsoft	C 2 - 1
200	Microsolutions	32
195	Microtek Lab Inc	42
172	MIS Computer Systems	289
160	Mouse Systems	235
168	Multiple Zones	144-145
194	Nanao USA Corp	154-155
–	NCR	157-160
–	NEC	177-178
203	NEC	182-184
205	NEC	214-215
187	NEC	252-253
177	New Vision Technology	31
139	**Nisca**	**191**
64	NordicTrack	40
–	NRI Schools	279
–	NRI Schools	211-212
140	Okidata	85
233	Patton & Patton	20
230	PC America	274
–	PC Connection	220-223
–	PC World	294
155	PC World On-Line	263
207	PC World On-Line	303
–	PCW Reprints By Fax	249
212	PK Ware, Inc	30
256	Powersoft Corp.	122-123
184	QMS Inc.	227
189	Quarterdeck	189
239	Rose Electronics	257
250	Safeware Insurance	302
112	Stereo PC	264
–	Symantec	138-139
244	Texas Instruments	25
–	The Computer Book Club	245
228	Toshiba America Inc	202-203
148	USA Flex	276-277
192	Velocity Development	12
–	WordPerfect Corp	196-197
238	Worldwide Technologies	286
258	Zeos International	11
251	Zeos International	13
215	Zeos International	6-7
260	Zeos International	8-9
168	Zone Publishing	302

Advertiser Index by Product Category

Get more information—circle the appropriate number on the reader service card.

HARDWARE

Boards/Chips/Cards

92	Cyrix Corp	216-217
60	Digital Equipment Co	93-95
251	Zeos International	13

Communications

105	Hayes Microcomputer	26

Computers

66	Acma Computers	33
–	AST Research	22-23
32	Austin Computers	167-169
83	Compaq Direct	99
83	Compaq Direct	96-97
35	Compaq Direct Plus	117
47	Compaq Direct Plus	255
14	CompUSA	246-247
–	Gateway 2000	44-69
–	Gateway 2000	45-69
127	IBM Corp.	126-129
162	IBM Corp.	3-Feb
116	Inmac	105-108
166	Media Age	280-283
157	Micro Express	147
157	Micro Express	149
172	MIS Computer Systems	289
–	NCR	157-160
203	NEC	181-183
148	USA Flex	276-277
215	Zeos International	6-7

Desktop Publishing

	Nanao USA Corp	154-155

Input Devices

223	Key Tronic	184
118	Kinesis Corporation	242
122	Logitech Inc	241
195	Microtek Lab Inc	42
160	Mouse Systems	235

Laptop/Notebook

–	AST Research	22-23
20	Austin Computer Syst	100-101
–	Gateway 2000	44-69
–	Gateway 2000	45-69
–	Hewlett Packard	36-37
165	MEI Micro Center	41
244	Texas Instruments	25
228	Toshiba America Inc	202-203
258	Zeos International	11
260	Zeos International	9-Aug

Local Area Networks

239	Rose Electronics	257

Monitors/Displays

151	Mag Innovision	40
194	Nanao USA Corp	154-155
–	NEC	177-178

Multimedia

54	Creative Labs	237
7	Creative Labs	232-233
22	Media Magic	38
167	Media Vision	278
187	NEC	252-253
112	Stereo PC	264

Peripheral/Sharing Devices

109	Intel Corp	86-87
239	Rose Electronics	257

Printers/Plotters

45	American Power Conversion	231
205	NEC	214-215
140	Okidata	85
184	QMS Inc.	227

Storage/Backup Devices

200	Microsolutions	32

Scanners/Digitisers

–	Epson America Inc	118-119
–	Hewlett Packard	82-83
195	Microtek Lab Inc	42

Systems

60	Digital Equipment Co	93-95
131	Insight Direct	294D
–	Microsoft	229

Other

–	Curtis Manufacturing	29

SOFTWARE

Accounting/Financial

–	Chipsoft Inc	125
39	Computer Associates	265
56	Cougar Mountain Software	294H
–	Intuit	137

D atabase Management

16	Borland	35
78	Computer Associates	14
256	Powersoft Corp.	122-123

Desktop Publishing

177	New Vision Technology	31

Electronic Mail

–	WordPerfect Corp	196-197

Entertainment

192	Velocity Development	12

Graphics

93	Corel	21
	Integrated Software	
–	Lotus - Smart Suite	77-79
–	Microsoft	1

Management

90	Helix Software	259
230	PC America	274

Operating Systems

–	IBM Corp.	121

Project Management

233	Patton & Patton	20

Schedule Software

–	WordPerfect Corp	196-197

Spreadsheets/Templates/Forms

–	Lotus 1-2-3	16-17
22	Media Magic	38

Taxware

–	Chipsoft Inc	125
197	Computer Associates	91

Utilities

52	Central Point Software	209
212	PK Ware, Inc	30

Windows

149	Information Synthesis	103
–	Symantec	138-139

Other

171	Delrina Technology	88
168	Multiple Zones	144-145
168	Zone Publishing	302

MISCELLANEOUS

Mail Order

31	All Micro	294A
8	Arlington Computer Products	287
68	Computer Discount Warehouse	290-293
125	Diskette Connection	294B
–	L A Trade	288
126	Lyco Computers	275
172	MIS Computer Systems	289
64	NordicTrack	40
–	PC Connection	220-223
148	USA Flex	276-277
238	Worldwide Technologies	286

On-Line Services

33	Compuserve Inc.	165
	Comtrade	300
107	Ge Information Service	111
107	Ge Information Service	113-115
155	PC World On-Line	263
207	PC World On-Line	303

Periodicals

–	The Computer Book Club	245

Service/Support

9	Advanced Logic Research	18
142	IBM PC Company	10
187	NEC	252-253
–	NRI Schools	279
189	Quarterdeck	189
250	Safeware Insurance	302

Training

206	Learnkey, Inc.	284-285
–	NRI Schools	211-212

Index

Products Featured in Editorial

Get more information—circle the appropriate number on the reader service card.

Other

– Anthro Corp. 24
– PC World 294
– PCW Reprints By Fax 249

Add-On Board

708 ACE, Best Data Products 84
707 ReelMagic, Sigma Designs 81
628 Reply Video Accelerator Adapter, Reply 120
709 Spectrum Envoy, Spectrum Signal Processing 84

Business Application

618 Network Scheduler 3 version 2, Powercore 116

Communications

619 CompuServe Navigator for Windows, CompuServe 116
625 Fax and Find, Caere 120

Compression

698 SpaceManager 1.5, Vertisoft Systems 185, 226
699 Stacker 3.1, Stac Electronics . 185, 226
665 XtraDrive 3.0, Integrated Information Technology 226

Computer System

673 AcerPower Series 9000, Acer America 134
674 Acma 486/66/DX2 System, Acma Computers 135
675 ALR Evolution V, Advanced Logic Research 136
714 ALR Evolution V/60, Advanced Logic Research 72
691 ALR Flyer VL 4/50d, Advanced Logic Research 150
676 Ares 486-66DX2 EISA/VESA, Ares Microdevelopment 136
620 Aspen Aura, Aspen Computer ... 120
654 AST Advantage Adventure series, AST Research 89
677 AST Premmia 4/66d Model 343W, AST Research 136
715 Austin Premier P5-60 System, Austin Computer 73
678 Blackship BLK 486/66LB, Blackship Computer Systems ... 140
716 Blackship BLK P60, Blackship Computer Systems 72
692 CAF Master L737 DX2/66, CAF Technology 150
656 Compaq Concerto notebook, Compaq Computer 90
693 Compaq Deskpro 5/60M 510, Compaq Computer 150
717 Compaq Deskpro XE 560, Compaq Computer 71
679 Comtrade EISA VL-Bus Professional 66, Comtrade 140
680 Dell Dimension 466V/XPS, Dell Computer 141
718 Dell Dimension XPS P60, Dell Computer 71
681 Diamond DT 486DX2-66 VL-SCSI, Diamond Technologies 141

Reader Service Number		Page Number
682	Gateway 2000 4DX2-66V, Gateway 2000	142
719	Gateway 2000 P5-60, Gateway 2000	72
–	IBM PC Company ValuePoint P60/D, IBM PC Company	142
683	Insight 486DX2-66 Smart Server, Insight	143
684	National MicroComputers Universal Pro-System 466, National MicroComputers	143
685	NCR System 3333, NCR	143
686	NEC Image 466es, NEC	146
720	NEC Image P60, NEC	72
687	Netis N4D266VL, Netis Technology	146
704	OmniBook 425, Hewlett-Packard	80
655	Panasonic CF-V21P notebook, Panasonic	90
688	Poly4586-66VC, Polywell Computers	148
689	Tagram Concerto Hi-Note 486DX2-66, Tagram Systems	148
694	Tri-Star 486DX2/66 VL Station, Tri-Star Computers	150
695	Unisys PW2 Advantage Plus Model 4666, Unisys	150
696	USA Flex VL486DX2-66, USA Flex	150
624	WinBook 486SX, Micro Electronics	124
690	Zeos 486DX2-66, Zeos International	148

Database Management

647 Q&A 4.0 for Windows, Symantec 104

Desktop Publishing

705 Ventura Publisher 4.2, Corel 80

Development Tool

661 PowerBASIC 3.0, PowerBASIC 225

Entertainment/Game

639 Amarillo Slim Dealer's Choice, Villa Crespo 301
641 Take-A-Break Pinball, Dynamix 301
640 The Curse of the Catacombs, Froggman 301
627 The FarSide Daily Planner, Intermission 4.0, Opus 'n Bill Screen Saver, Delrina 124
638 Whac-A-Mole, SWFTE Int'l 301

Fax-Modem

617 Hayes Optima 144 + Fax144 for PCMCIA, Hayes Microcomputer Products 112
616 Xircom Ethernet+Modems, Xircom 112

Financial

609 Kiplinger's CA-Simply Money 3.1, Computer Associates International 207
610 Managing Your Money 10.0, Meca Software 207
611 Microsoft Money 2.0, Microsoft 208
612 MoneyCounts for Windows 1.0a, Parsons Technology 208
– Quicken for DOS 7.0, Intuit 210
– Quicken for Windows 3.0, Intuit 213
615 WinCheck 3.0p, Wilson Window Ware 219

Hard Drive

632 PocketFile 105 hard drive, Integral Peripherals 120

Image Editing

648 Aldus PhotoStyler 2.0, Aldus 104
623 Paint Shop Pro 2.0, JASC 120

Mail Order

674 Acma 486/66/DX2 System, Acma Computers 135
675 ALR Evolution V, Advanced Logic Research 136
691 ALR Flyer VL 4/50d, Advanced Logic Research 150
676 Ares 486-66DX2 EISA/VESA, Ares Microdevelopment 136
678 Blackship BLK 486/66LB, Blackship Computer Systems 140
679 Comtrade EISA VL-Bus Professional 66, Comtrade 140
680 Dell Dimension 466V/XPS, Dell Computer 141
681 Diamond DT 486DX2-66 VL-SCSI, Diamond Technologies 141
682 Gateway 2000 4DX2-66V, Gateway 2000 142
– IBM PC Company ValuePoint P60/D, IBM PC Company 142
683 Insight 486DX2-66 Smart Server, Insight 143
684 National MicroComputers Universal Pro-System 466, National MicroComputers 143
685 NCR System 3333, NCR 143
687 Netis N4D266VL, Netis Technology 146
688 Poly4586-66VC, Polywell Computers 148
689 Tagram Concerto Hi-Note 486DX2-66, Tagram Systems 148
694 Tri-Star 486DX2/66 VL Station, Tri-Star Computers 150
696 USA Flex VL486DX2-66, USA Flex 150
690 Zeos 486DX2-66, Zeos International 148

Modem

622 Courier V.32terbo Modems, US Robotics 120

Multimedia Software

– Ultimedia Builder/2, IBM 81
– Ultimedia Perfect Image/2, IBM 81
– Ultimedia Workplace/2, IBM 81
652 Windows Sound System 2.0, Microsoft 109

Operating System/Environment

701 MS-DOS 6.2 Upgrade for Dummies, Special Edition, Microsoft 170
697 MS-DOS 6.2, Microsoft 170, 185
702 Novell DOS 7, Novell 170
– PC-DOS 6.1, IBM 170

Other Peripheral

660 The Discovery Card, AllMicro 224

Printer

601 Brother HJ-400, Brother International 198
603 C. Itoh ProWriter SpeedJet CJ-300, C-Tech Electronics 198
602 Canon BJ-200, Canon Computer Systems 198
658 Canon BJC-600, Canon Computer Systems 92
604 Epson Stylus 800, Epson 199
657 Hewlett Packard DeskJet 310, Hewlett Packard 92
605 HP DeskJet 500, Hewlett-Packard 199
606 Lexmark ExecJet II, Lexmark International 200
607 NEC Jetmate 1000, NEC 200
659 Panasonic KX-4400 and KX-5400 Printers, Panasonic Communications & Systems Company 92
703 Sharp JX-9460PS, Sharp Electronics 76
608 Texas Instruments microMarc, Texas Instruments 200

Printer Utility

631 SmartPrint Starter Kit, Dresselhaus Computer Products 124

Scanning Software

646 Cognitive BCR, Cognitive Technology 102
644 CypherScan 1000, CypherTech 102
649 OmniPage Professional 5.0, Caere 109
645 Scan-in-Dex, Microtek International 102

Software Suite

642 Lotus SmartSuite 2.1, Lotus Development 98
643 Microsoft Office 4.0, Microsoft 98

Spreadsheet

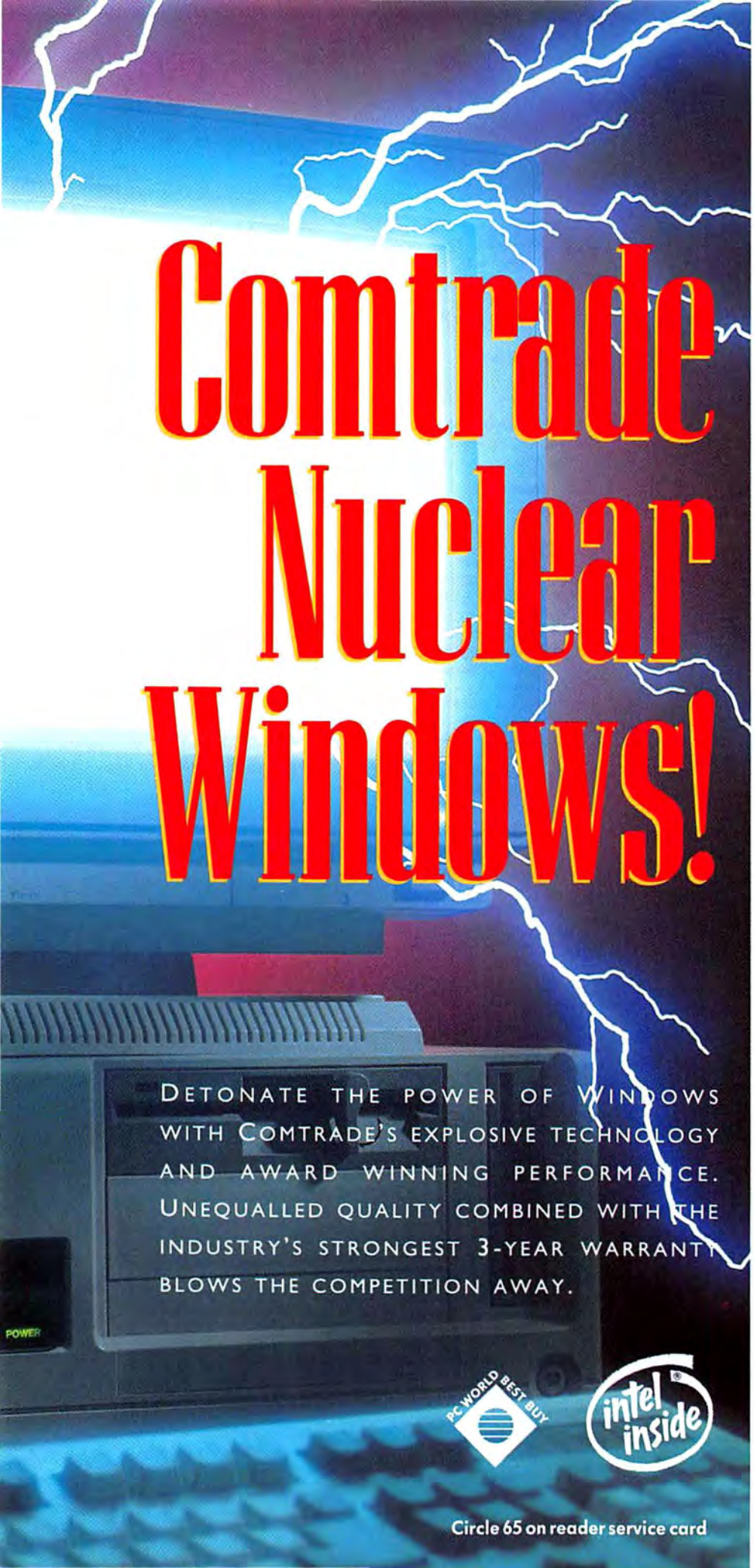
721 1-2-3 release 4 for DOS, Lotus Developement 74

User Group

662 ACGNJ, Bill Farrell 225

Utility

637 AnyView, Binar Graphics 240
626 Memory Commander 4.0, V Communications 124
634 Norton Utilities, Symantec 304
621 Outside In 2.1, Systems Compatibility 120
629 Picture Prowler, Xing Technology 124
667 Rooms for Windows, XSoft 226
651 WinSense 2.0, SoftLogic Solutions 110



EISA/PCI Professional

- Hottest 486 EISA and P5/60 PCI Professional System
- OverDrive Socket for **Pentium™** P24T Technology
- 256K Ultra Fast Write-Back Cache SRAM
- **8MB** RAM & Expandable to 128MB
- One Floppy Drive (3.5" or 5.25")
- High Speed **CD-ROM** (280ms)
- 32-Bit VL-Bus / PCI IDE Hard Disk Controller
- **530MB** 10ms IDE Drive with 256K Cache
- 32-Bit VL-Bus / PCI **ThunderPro** Graphics Accelerator 1MB RAM (Up to 1280x1024 & up to 16.7 million Colors)
- 15" Flat Screen .28mm Non-interlaced Color Monitor **(Low Radiation, 36% larger edge to edge display)**
- 2 Serial, 1 Parallel & 1 Game Ports
- Enhanced 101-key Keyboard & Serial Mouse
- Anti-Virus MS-DOS 6.2 & Windows 3.11
- Three-Year System & Labor Warranty

486/66 DX2 $2325
P5/60 PCI $2975

- Diamond Viper Accelerator (VL-Bus/PCI) Add $220
- Upgrade to 17" 1280x1024 Monitor Add $390

VESA Local Bus Best Buy

- OverDrive Socket for **Pentium™** P24T Technology
- 128K Cache SRAM & Expandable to 256K
- **8MB** RAM & Expandable to 64MB
- One Floppy Drive (3.5" or 5.25")
- 32-Bit VL-Bus IDE Hard Disk Controller
- **420MB** 12ms IDE Drive with 128K Cache
- 32-Bit VL-Bus **ThunderPro** Graphics Accelerator with 1MB RAM (Up to 1280x1024 & up to 16.7 million Colors) **(Up to 38 Million Winmark 3.11)**
- 15" Flat Screen .28mm Non-interlaced Color Monitor **(Low Radiation, 36% larger edge to edge display)**
- 2 Serial, 1 Parallel & 1 Game Ports
- Enhanced 101-key Keyboard
- Hi-Resolution 400 DPI Serial Mouse
- Anti-Virus MS-DOS 6.2 & Windows 3.11
- Three-Year System & Labor Warranty

486/33 DX $1795
486/66 DX2 $1995

- MultiMedia Kit Installed (MultiSession 280ms CD-ROM, Sound Card, Two Speakers, 4 CD-ROM titles) Add $295

1.800.969.2123

International 818.961.6688
Fax 818.369.1479
Tech Support 800.899.4508
Hours: 7:00-7:00 Pacific Mon-Sat
15314 East Valley Boulevard
City of Industry, California 91746

COMTRADE

"Where Quality is Everything"

Purchase order from Fortune 1000 companies, governments and institutions subject to approval. Prices are subject to change without notice. Shipping & opened software are not refundable. 30-day money back guarantee applies to Comtrade system only. *Three year warranty applies to Comtrade manufactured components only - 18 months warranty on monitor & hard drive. The Intel Inside Logo, Pentium, and OverDrive are trademarks of Intel Corporation.

Circle 65 on reader service card

Pummeling Moles, Learning to Play Poker, and Desktop Pinball

Grit your teeth, take aim, and bash those devilish rodents! Slam the enormous hammer down as you prowl the mole-infested landscape. Watch in wonder as your mild-mannered mouse is transformed into a blunt object.

I can remember my first Whac-A-Mole game as if it were yesterday: a county fair, a grid with little holes through which mechanical moles popped up for me to crush with my gigantic mallet. There was something perfect, even dreamlike, about the mindless, bloodthirsty state I fell into trying to guess from which hole the next mole would emerge...so I could smash it, and the next, ceaselessly, mole after mole after mole. Zen and the art of mole-bashing? Testosterone overload?

SWFTE's Windows-based PC version of Whac-A-Mole is almost as silly (and damn near as habit-forming) as the real thing. Five animated moles pop from their holes, taunting you, daring you to bop them with the huge hammer you control with your mouse. First on mean city streets, then in a disco, then on the moon, and finally in the darkest jungle, these pests leave you no choice but to destroy them.

You'll need fast reflexes: A score of 90 percent is required to get from one level to the next, and each time you jump a level the dratted moles get faster and meaner. The game totals your score after every round and displays piles of dead moles to rouse you to ever-higher frenzies.

If someone (like your supervisor) asks what you're doing, tell her that this is a terrific way to make sure your mouse is working perfectly. It is, too!

You'll Never Learn Cheaper

Still in search of the ultimate PC poker game, we turn this month to Amarillo Slim Dealer's Choice. In many ways, this is the best poker simulation I've seen yet. Fast, flexible, and with a good "teaching" option, its only serious deficit is the lack of amusing poker chat.

The game, which includes no fewer than 28 poker variations, is almost infinitely customizable. You can set every house rule from maximum bet to raise limit. You can pick your opponents from 15 players who range from casual to dangerous. You can turn summary advice on and off; full advice is available at a mouse click. There's even voice simulation—but unless you have a sound board, it sounds like a frog is trapped inside your unit.

Since the game doesn't bother with fancy animation (cards don't float across the table; they simply appear), the play moves quickly. But without the traditional snappy repartee, this poker game just doesn't feel like the real thing. Still, between the fine tutorial function and complete on-screen explanations of rules and game variations, this is a fine way to improve your game.

Whac-A-Mole gives you the tools to strike a blow against the rodent hordes. And those damn moles get in everywhere, even to this fancy disco party.

Killer Rabbits

The catacombs beneath the town of Morbidity are not recommended for casual tourists. Huge bugs and slimy zombies jump out of nowhere to attack you, and short-tempered skeletons with nasty swords may be close behind. There are even killer rabbits! Nonetheless, for armchair adventurers with a secret desire to play Rambo, Froggman's The Curse of the Catacombs is a great way to relax. The game's amazing $14.95 price tag is relaxing in itself.

The Curse of the Catacombs is billed as a "3-D virtual reality" adventure, which is a wild overstatement. As far as I can tell, all this means is that you view the catacombs through the eyes of the main character: You see a wall. You press the arrow key, and the screen swings around so you see a passageway. Big deal. Apparently, Froggman's PR department decided that any excuse to print the fashionable "VR" phrase on the box would be acceptable.

This aside, the game really is fun. The catacombs are lined with tapestries, many of which conceal secret alcoves full of useful treasure and weaponry. You can blast your way into the hidden rooms with one of several magical weapons. Movement, via cursor keys, mouse, or joystick, is fast and intuitive, and there are 16 levels to explore. There's even a Hints and Solutions section with maps to the Garden of Forgotten Souls and the Lair of the Succubus. Just watch out for those killer rabbits.

Real Bells, Real Whistles

Windows' graphics and multimedia capabilities rarely get as tough a workout as in Take-A-Break Pinball, an

By Michael Goodwin

IN THE CURSE OF THE CATACOMBS, you will need to blast your way through the catacombs to find out what sort of evil or hidden treasure lies waiting to be discovered behind that tapestry.

impressive simulation of the classic arcade machines. This package includes eight pinball games, and while none of them is the classic Fireball 500, the sizzling sound and split-second bouncing bumper-ball action will give even pinball wizards a serious run for their money.

Take-A-Break Pinball's designers built in several unique features that the real-life machines could never offer. For instance, in Planet Pinball, if you flip your ball into the Buttes of Estros Trap Hole, an animated pterodactyl steals the ball and stashes it in her nest. You'll also enjoy animated backglasses, time warps, and the most amazing multiball play mode I've seen. Awesome!

Dynamix has done an amazing job of capturing the pinball experience: it has flippers, roll-over buttons, trap holes, targets, kickers, the inimitable backglass art. You can even use your keyboard controls to "shove the machine" in order to goose the ball away from a hazard, or onto a high-scoring roll-over (the experts call this "grunching")—but a delicate touch is needed to keep from setting off the tilt penalty.

I do have two complaints about Take-A-Break Pinball. The flippers are a little sticky, and you must have a sound board in order to hear the bells and whistles. Not a peep, pop, siren, or clang emerges from your PC's built-in speaker. These problems aside, I am totally impressed.

- **Whac-A-Mole** $39.95; SWFTE Int'l; 800/237-9383
  Reader service no. 638
- **Amarillo Slim Dealer's Choice** $29.95; Villa Crespo; 708/433-0500
  Reader service no. 639
- **The Curse of the Catacombs** $14.95; Froggman; 800/876-3764
  Reader service no. 640
- **Take-A-Break Pinball** $49.95; Dynamix; 800/326-6654
  Reader service no. 641

Michael Goodwin is a contributing editor for PC World. *He can be reached on PC World Online (see page 12 for contact information).* ■

Sure it's Insured?

Most computers are not insured. And ordinary policies may exclude or limit the coverage you need. Do you have the ready cash to replace stolen or damaged equipment? You will if you have SAFEWARE's® comprehensive COMPUTEROWNERS℠ coverage. It provides full replacement of hardware, media and purchased software for just pennies a day! Your protection includes theft, fire, accidental damage, and more. Even costly power surges are covered. Just select your system value and premium from the table below. Use the coupon or call for immediate coverage or more information.

Amount of Insurance	Annual Premium
Up to $2,000	$ 49
$ 2,001-$ 5,000	$ 69
$ 5,001-$ 8,000	$ 89
$ 8,001-$11,000	$109
$11,001-$14,000	$129

Call for rates on higher amounts
Underwriting requirements may vary by state. Void where prohibited.

SAFEWARE

1-800-848-3469

FAX 1-614-262-1714
On CompuServe, GO SAF
On GEnie, SAFEWARE

SAFEWARE, The Insurance Agency Inc.
2929 N. High St.
P.O. Box 02211
Columbus, OH 43202

10 DAY TRIAL. Review your policy for 10 days after you receive it. Satisfaction guaranteed or your money back.

Name _____
Address _____
Phone (Daytime) _____
☐ Check Enclosed ☐ Visa ☐ MasterCard Exp _____
Card # _____
Total value of hardware, media and purchased software $ _____ (Insure to full value)
Your signature _____
Mail to: **SAFEWARE**, The Insurance Agency Inc., P.O. Box 02211, Columbus, OH 43202

Circle 250 on reader service card

PC VERSION

*The first CD-ROM that uses multimedia to tell you **about** multimedia!*

The Guided Tour of Multimedia

Over 20 hours of fact-packed interactive multimedia information for beginners and professionals!

You'll experience the exciting world of multimedia first hand. The power, the potential, and the easy, step-by-step ways you can harness this useful tool for business, education... or just plain fun! *Experience the wonder of multimedia yourself! It's easy to order!*

VIDEO
Capture/Playback video

SOUND
Add music and voice-over

ANIMATION
Makes your work fly

MULTIMEDIA

Developed and Produced by Zone Publishing, Inc.

Call 1-800-942-4000
From Canada 800-643-7373, International 213-380-7200

Just $39.95 Plus applicable taxes & $3.50 for shipping & handling

Please have your VISA or MasterCard ready when you call. Or send your check or money order to: **The Guided Tour of Multimedia**, 914 S. Hoover St, Los Angeles, CA 90006.

Here's what you need to run **The Guided Tour of Multimedia**

- PC 386SX or better
- Windows 3.1 or 3.0 with Extensions
- 4MB RAM recommended
- 30MB hard disk
- VGA display, 256 colors
- CD-ROM drive
- 8-bit sound board

PC Multimedia PC

Circle 259 on reader service card

RECEIVE **FREE** SOFTWARE AND $15 CREDIT TOWARD COMPUSERVE WHEN YOU CALL 1 800 848 8199 AND ASK FOR THE PC WORLD REPRESENTATIVE.

AFTER A LONG NIGHT'S WORK, BRAD MEYERS TOOK A FEW MINUTES TO LET TWO HUNDRED ASSOCIATES KNOW THAT JOSHUA MARK WEIGHED 8LBS., 7OZ.

PC WORLD ONLINE ON COMPUSERVE OFFERS ONLINE MAIL AND CHAT BOARDS. COMMUNICATE WITH COLLEAGUES AND EVEN PC WORLD EDITORS WITH THE STROKE OF A KEY.

PC WORLD ONLINE

Circle 207 on reader service card

Diagnosis for the Rest of Us

Take this word test: If I say "dog," you say "cat." If I say "RAM," you say "not enough." Okay, one more. If I say "deadline," you say "The computer's down." I thought so.

The more complicated my computer becomes, the more I tinker with it, and—no surprise—the more often it's down. And I don't mean just depressed, either. So to minimize computer downtime, I've armed myself with a battalion of diagnostic software, some of it even free, to gain insight into my computer. And to keep myself out of trouble, I've devised a few upgrading and installation rules.

An important first step—and something most of us don't bother with until it's too late—is to inventory everything in your system. That way, if your memory manager or some other variant goes kaflooey (no, you won't find that word in the index), you've got an answer when tech support asks about the chip on your video board. Or when your newly installed sound card won't work, you can check your list of assigned interrupts and determine the conflict.

Profiles in ASCII

Getting a profile of your computer is easy. If you have DOS 6.*x* or Windows 3.1, a no-frills diagnostic program is probably on your PC already. Microsoft Diagnostics, known as MSD.EXE, does an exemplary job of reporting details—in my case, *45 pages* of details. To get a full report on your system, simply enter **MSD /P MSD.RPT** at the DOS prompt. To print a report (a good thing to have in case your system is so messed up you can't get to the hard disk), follow that command with **TYPE MSD.RPT > PRN**. Whenever you add a new board, have MSD print a new report for you. A word of caution: Always run MSD from DOS; if you do it from inside Windows—even from a DOS box within Windows—you'll wind up with inaccurate results.

For about $100, though, you can get a great diagnostic program that runs under Windows. Dariana's WinSleuth Gold Plus not only knows a few tricks that MSD never heard of, it's prettier to look at, too. WinSleuth pokes into every nook and cranny of your system, examining the components you'd expect, such as drives, video, and memory. It then goes a step further by supplying specifications (and tech support phone numbers) for over 40 popular devices, so you can check your system for the availability of their specific DMA channels and interrupts. That means you can discover whether the CD ROM drive or sound card you've been wanting is compatible *before* you buy it. • *WinSleuth Gold Plus $99.95 through March, $189 thereafter; Dariana Software; 800/892-9950, 714/236-1380, 714/236-1390 (fax). Reader service no. 633*

Getting a handle on your computer is one thing; preventing problems is another. Here are a few tricks—all learned the hard way—for averting disaster before it strikes.

A little regular maintenance can save you a lot of grief. Not long ago, a blue haze started overshadowing everything on my monitor. I thought the worst: The monitor's shot, the video board's bad, or maybe my mind's going. Turned out to be a loose video cable. So now I check and tighten every cable on my system—including power cords—twice a year. And when I crack the case, I examine the add-in boards and internal cables to make sure everything is properly connected.

If you upgrade your system—say, install a sound card or a new caching controller—don't add anything else for at least a week. Similarly, don't add two items—whether hardware or software—at the same time. I've made that mistake a number of times (hey, looking at new stuff is a part of my job), and I've always regretted it. It's a lot like trying to house-train a whole litter of puppies—when things don't go as planned, you never know who's to blame. Best to make sure one new addition is well behaved before you try another.

Finally, I keep two emergency floppies. I let Norton Utilities' Rescue Disk create the first. It makes a bootable floppy that holds a copy of my system setup information, boot record, and File Allocation Table, along with a way to retrieve them. It also contains critical drivers and a bunch of Norton and DOS utility programs, each essential for recovering from a disaster. The second rescue disk has a copy of my tape backup program. That's because the last time my hard disk crashed I had a full backup, but the program I needed to restore it was—you guessed it—on the hard disk. • *Norton Utilities $179; Symantec Corp.; 800/441-7234, 408/252-3570. Reader service no. 634*

Contributing Editor Steve Bass is president of the Pasadena IBM Users Group. He can be reached on PC World Online (see page 12 for contact information).

By Steve Bass

WAYNE VINCENT

"Why on earth would this bozo think I'd want to buy a 1993 Pentium with a bus that's been dragging its butt since 1984?"

INTRODUCING THE "NO BOZO" PCI BUS PENTIUM PC.

Imagine trying to pawn off a Pentium™ machine with a bus designed for a 286 antique! Well, that's not the case with the Dell Dimension™ XPS Pentium PCs. These racehorses feature a 60MHz Pentium Processor that delivers nearly twice the performance of the i486™ 66MHz CPU. And thanks to a redesigned floating point unit, these Pentium systems deliver up to five times the performance of the i486 66 processor in math-intensive applications.

What's more, Dell Dimension XPS Pentium systems feature the PCI bus. Capable of sustaining 120MBps as opposed to 16 with ISA, these systems take full advantage of the processing power of the Pentium CPU. Delivering maximum performance from even the most graphic-intensive Windows™ applications.

So don't settle for today's CPU with yesterday's I/O technology. Call Dell. And forget about those other bozos.

DELL DIMENSION XPS P60. PCs DESIGNED FOR THE HIGH PERFORMANCE USER.

DELL DIMENSION XPS P60
PENTIUM 60MHz SYSTEMS

$2,999
BEST BUY

Business Lease: $111/MO.

• 8MB RAM • 128MB Max RAM • 450MB Hard Drive • 256KB External Cache • 5 Expansion Slots Available (3 16-Bit ISA, 1 PCI, 1 PCI/ISA Shared) • PCI #9GXE Video Accelerator Card with Video Control Panel Software • 1MB Video RAM • UltraScan™ 14C Monitor (14", 1024 x 768, .28mm, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • MultiSession, Double-Spin CD ROM Drive • MS-DOS® 6.0/Microsoft® Windows 3.1/ Mouse

Order Code #5000055

$3,599

Business Lease: $130/MO.

• 16MB RAM • 128MB Max RAM • 528MB Hard Drive • 256KB External Cache • 5 Expansion Slots Available (3 16-Bit ISA, 1 PCI, 1 PCI/ISA Shared) • PCI #9GXE Video Accelerator Card with Video Control Panel Software • 1MB Video RAM • UltraScan 15FS Monitor (15", 1024 x 768, .28mm, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • MultiSession, Double-Spin CD ROM Drive • MS-DOS 6.0/Microsoft Windows 3.1/Mouse

Order Code #5000056

$3,999
ADVANCED TECHNOLOGY

Business Lease: $144/MO.

• 16MB RAM • 128MB Max RAM • 528MB Hard Drive • 256KB External Cache • 5 Expansion Slots Available (3 16-Bit ISA, 1 PCI, 1 PCI/ISA Shared) • PCI #9GXE Video Accelerator Card with Video Control Panel Software • 1MB Video RAM • UltraScan 17FS Monitor (17", 1280 x 1024, .26mm Stripe Pitch, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • Multi-Session, Double-Spin CD ROM Drive • MS-DOS 6.0/Microsoft Windows 3.1/Mouse

Order Code #5000057

DELL™

TO ORDER, CALL
800-365-1460

HOURS: MON-FRI 7AM-9PM CT SAT 10AM-6PM CT SUN 12PM-5PM CT
IN CANADA, CALL 800-668-3021. PLEASE REFERENCE #11DCH

INTRODUCING THE HIGH PERFORMANCE DELL DIMENSION AND DELL DIMENSION XPS SYSTEMS.

When you call to order a Dell Dimension system, you'll always reach someone who speaks your language.

Someone who knows the Pentium Processor, PCI, VL, and you.

Someone who can actually help you optimize the system that's ideal for your specific needs—with guaranteed compatibility between all components.

*Should you ever require help in the future, our technical support hotline is open twenty-four hours a day, seven days a week. We'll respond to your phone call in five minutes or less. Guaranteed.**

If we can't solve your problem over the phone, we will send someone to service your machine by the next business day. And we guarantee that service, too.*

We believe it's service like this that's earned Dell the Highest Ranking in the J.D. Power and Associates 1993 Desktop Personal Computer Satisfaction Study† among business users.

So call Dell. And get a great price on the system you want. From someone who knows what you're talking about.

DELL DIMENSION XPS. PCs DESIGNED FOR THE HIGH PERFORMANCE USER.

DELL DIMENSION 425SV
i486 SX 25MHz SYSTEM

$1,399

Business Lease: $52/MO.

• 4MB RAM • 64MB Max RAM • 270MB Hard Drive • Upgradeable to Pentium Overdrive™ • 5 16-Bit ISA Expansion Slots Available, 2 on VL-Bus™ • Accelerated Local Bus Video • UltraScan 14C Monitor (14", 1024 x 768, .28mm, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • MS-DOS 6.0/ Microsoft Windows 3.1/ Mouse

Order Code #5000058

DELL DIMENSION 433V
i486 DX 33MHz SYSTEM

$1,799

Business Lease: $67/MO.

• 4MB RAM • 64MB Max RAM • 270MB Hard Drive • Upgradeable to Pentium Overdrive • 5 16-Bit ISA Expansion Slots Available, 2 on VL-Bus • Accelerated Local Bus Video • UltraScan 14C Monitor (14", 1024 x 768, .28mm, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • MS-DOS 6.0/ Microsoft Windows 3.1/ Mouse

Order Code #5000059

DELL DIMENSION 466V
i486 DX2 66MHz SYSTEM

$1,999

BEST BUY

Business Lease: $74/MO.

• 4MB RAM • 64MB Max RAM • 270MB Hard Drive • Upgradeable to Pentium Overdrive • 5 16-Bit ISA Expansion Slots Available, 2 on VL-Bus • Accelerated Local Bus Video • UltraScan 14C Monitor (14", 1024 x 768, .28mm, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • MS-DOS 6.0/ Microsoft Windows 3.1/ Mouse

Order Code #5000060

DELL DIMENSION XPS 450V
i486 DX2 50MHz SYSTEM

$2,499

Business Lease: $92/MO.

• 8MB RAM • 64MB Max RAM • 320MB Hard Drive • 128KB External Cache • Upgradeable to Pentium Overdrive • 5 16-Bit ISA Expansion Slots Available, 1 on VL-Bus • VL #9GXE Video Accelerator Card with Video Control Panel Software • 1MB Video RAM • UltraScan 15FS Monitor (15", 1024 x 768, .28mm, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • Multi-Session, Double-Spin CD ROM Drive • MS-DOS 6.0/Microsoft Windows 3.1 /Mouse

Order Code #5000061

DELL DIMENSION XPS 466V
i486 DX2 66MHz SYSTEM

$2,699

Business Lease: $100/MO.

• 8MB RAM • 64MB Max RAM • 528MB Hard Drive • 256KB External Cache • Upgradeable to Pentium Overdrive • 6 16-Bit ISA Expansion Slots Available, 1 on VL-Bus • VL #9GXE Video Accelerator Card with Video Control Panel Software • 1MB Video RAM • UltraScan 15FS Monitor (15", 1024 x 768, .28mm, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • MS-DOS 6.0/ Microsoft Windows 3.1/Mouse

Order Code #5000062

DELL DIMENSION XPS 466V
i486 DX2 66MHz SYSTEM

$2,999

Business Lease: $111/MO.

• 16MB RAM • 64MB Max RAM • 450MB Hard Drive • 256KB External Cache • Upgradeable to Pentium Overdrive • 5 16-Bit ISA Expansion Slots Available, 1 on VL-Bus • VL #9GXE Video Accelerator Card with Video Control Panel Software • 1MB Video RAM • UltraScan 15FS Monitor (15", 1024 x 768, .28mm, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • Multi-Session, Double-Spin CD ROM Drive • MS-DOS 6.0/ Microsoft Windows 3.1/Mouse

Order Code #5000063

DELL DIMENSION XPS P60
PENTIUM 60MHz SYSTEM

$3,999

Business Lease: $144/MO.

• 16MB RAM • 128MB Max RAM • 528MB Hard Drive • 256KB External Cache • 5 Expansion Slots Available (3 16-Bit ISA, 1 PCI, 1 PCI/ISA Shared) • PCI #9GXE Video Accelerator Card with Video Control Panel Software • 1MB Video RAM • UltraScan 17FS Monitor (17", 1280 x 1024, .26mm Stripe Pitch, NI) • One Diskette Drive (3.5") • Spacesaver Keyboard • Multi-Session, Double-Spin CD ROM Drive • MS-DOS 6.0/Microsoft Windows 3.1/Mouse

Order Code #5000064

TOY BOX

SIGMA DESIGNS REELMAGIC: $399

SOUND UPGRADE: $199

• Soundblaster 16
• Peavey 220 Stereo Speakers

MULTIMEDIA UPGRADE: $398

• Soundblaster 16 • Peavey 220 Stereo Speakers • Multi-Session, Double-Spin CD ROM Drive • Microsoft Home Software Sampler

US ROBOTICS 14.4 DATA/FAX MODEM: $179

VIPER VIDEO CARD‡: $199

(60 Million WINMARKS™), (Available Only On Dimension XPS)

DELL™

TO ORDER, CALL

800-365-1480

HOURS: MON-FRI 7AM-9PM CT SAT 10AM-6PM CT SUN 12PM-5PM CT

IN CANADA* CALL 800-668-3021. PLEASE REFERENCE #11DCJ

*for registered owners of Dell Dimension systems purchased after 8/1/93. For a complete copy, please call our TechFax™ line at 1-800-950-1329 or write Dell USA L.P., 9505 Arboretum Blvd., Austin,
's valid in U.S. only. Some products and promotions not available in Canada. Business leasing arranged by Leasing Group, Inc. *On-site service provided by BancTec Service Corp. On-site service may not be available in
s and Windows is a trademark of Microsoft Corporation. VL-Bus is a trademark of Video Electronics Standards Association. ‡The Viper Video Card is supplied to Dell by Diamond Computer Systems, Inc. Dell disclaims*

"I'd rather stick needles in my eyes than talk to one of those techno-wannabees who thinks a bus is some form of public transportation."

†1993 J.D. Power and Associates Desktop Personal Computer Satisfaction Study conducted among business users and based on 1,956 user respondents. ***TX 78759-7299. Attention Dimension Guarantees.*** *"Performance measured by running WinBench Version 3.11 at 1024 x 768, 256 colors using Viper Video Driver version 1.1. "Performance measured by running certain remote areas. The Intel Inside logo is a registered trademark and i486, Pentium and Overdrive are trademarks of Intel Corporation. MS-DOS and Microsoft are registered trademarks of Microsoft Corporation. All rights reserved.*

THE ONE WITH THE MOST TOYS WINS.

15" UltraScan™ color monitor (1024 x 768, .28mm, NI)

230MB hard drive and 128KB external cache

7 expansion slots (5 available)

VL #9GXE video accelerator card with video control panel software

$2,799

One-year next-business-day on-site service[3]

50MHz processor with 8MB of RAM

Multi-session, double-spin CD ROM drive

One diskette drive (3.5")

Sound Blaster 16-bit CD-quality audio card

Peavey amplified speakers

Labtec Dynamic microphone

Just in case you missed the price in all of the excitement, we'd be happy to show you one more time: $2,799. (Business Lease[6]: $104/Mo.).

You might find some other multimedia systems out there. But you won't find anything in the same league as the Dell Dimension™ XPS 450V. At least not for the price.

And it's just one of a whole family of affordably priced Dell multimedia systems.

Each one configured to give you more blast for your dollar. From the company that ranked highest in the 1993 J.D. Power and Associates Desktop Personal Computer Satisfaction Study among business users[†].

Call to order your Dell Dimension XPS 450V today. And come out a winner.

DELL™

TO ORDER, CALL

800-727-3311

HOURS: MON-FRI 7AM-9PM CT SAT 10AM-6PM CT SUN 12PM-5PM CT

IN CANADA* CALL 800-668-3021 PLEASE REFERENCE **#11DA4**

Order Code #5000054

intel inside

†1993 J.D. Power and Associates Desktop Personal Computer Satisfaction Study conducted among business users and based on 1,956 user respondents.