CAST YOUR 1993 WORLD CLASS BALLOT! WIN \$50,000 IN PRIZES

PCMORLD

June 1993 \$3.95

50 Super Spreadsheet Tips

Windows NT: DOS for The '90s?

HP's New Low-Cost Laser Printer

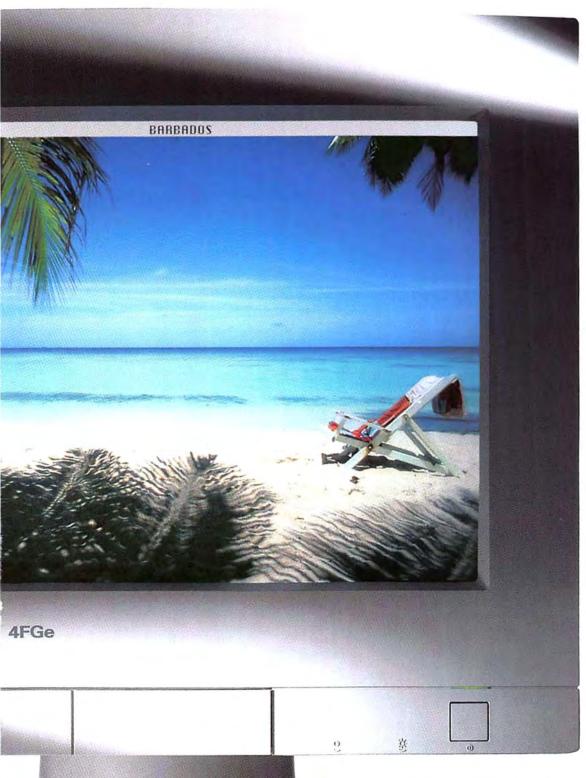
At Last! A Great 1-2-3 For Windows

486 PCs for





But it'll be okay.

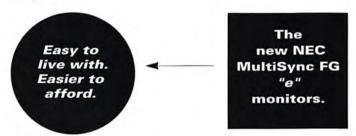


116 and 17 CR1 people in the act and players Mother in American section of the model attraction between the MCC technology in the American are they are the act of the control for the control of the Con



In our new FGe series, the 'e' is for ergonomics. And economics. They're easy to live with—the way NEC monitors have always been. They're also easier to afford.

Pardon us, but would you mind if we sat right here on your desk, a mere two feet away from you, for the next few thousand hours?



We realize that's a lot to ask. And we kept that firmly in mind when we created our new MultiSync* FGe* monitors.

More monitor for less money.

For less than you'd expect, they give



you everything you ever wanted in a monitor.

Big, roomy screens—15" for our 3FGe and 4FGe, 17" for our 5FGe*— provide plenty of space for Windows and multimedia video. Higher refresh rates deliver even crisper, steadier

images. They also offer broader compatibility with PC and Mac* platforms, including IBM*'s XGA*-2 standard. Compliance with strict Swedish MPR II emissions guidelines. Even, a new 3-year limited warranty.



All for a price that's nothing short of phenomenal for monitors this great.

The image you deserve.

Above all, they give you image quality so sharp, colorful and bright, it'll give your work a whole new focus.

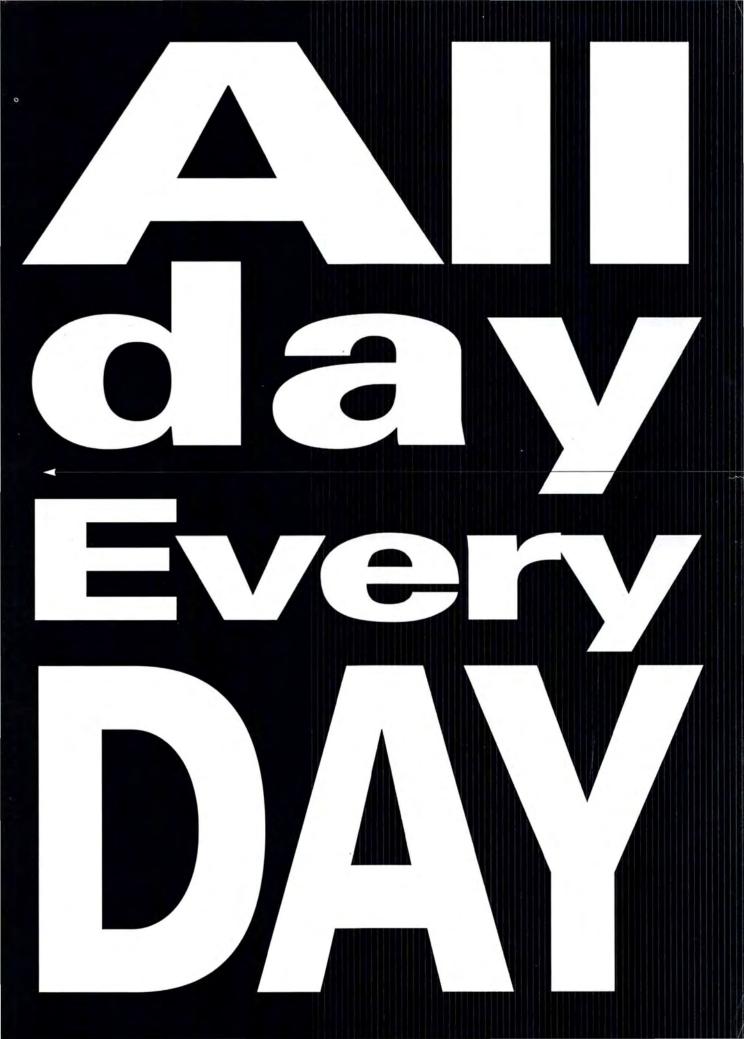
For more on the amazing MultiSync FGe monitors, call 1-800-NEC-INFO. In Canada, 1-800-343-4418. For details via fax call NEC FastFacts, 1-800-366-0476, and request document 1521.

Thank you for inviting us onto your desktop.

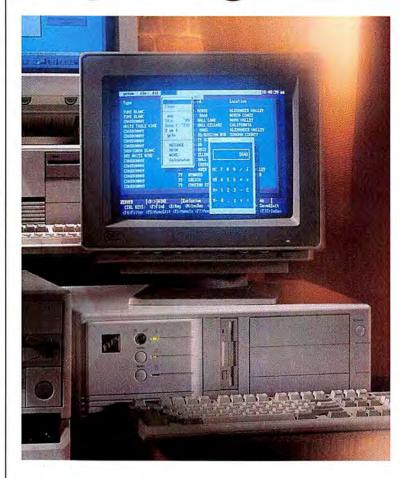
Because 👚 is the way you want to go.







PC WORLD



Cover Story

486s for \$1250

100 Holding out for rock-bottom prices before plunking down the cash for a 486? Now's the time to act. We pick the best of 25 price busters with a variety of 486 processors, from Intel's 486SX-25 to Cyrix's 486DLC-40.

- 105 Acma 486SX-33 VESA
- 105 ALR Flyer SD 4/25s
- 105 AST Bravo 4/25s
- 106 ATronics ATI-486SX/33
- 106 ATS 486-33
- 106 Auva 486DX/50
- 110 Blackship BLK 486DX/33 LB
- 110 CAF Gold 3D
- 110 CUI Advantage 486/25SX
- 111 Dell 425 s/L
- 111 Diamond DT 486DLC/40
- 114 First Computer FCS 486SX-33
- **114** Gateway 2000 4SX-25

- 114 Insight 486-33 MHz ValueLine
- 119 Keydata 486SX/25 Keystation
- 119 Micro Express ME 486DLC/40
- 119 MIS 425SX
- 120 Netis N425VL
- 120 Packard Bell PB425/8
- 124 Polywell Poly 486-33V
- 124 Quill Otech PCS-4S25
- 124 Silicon Valley SVC 486SX/33
- 126 Tandy 425 SX
- 126 USA Flex 486SX/25
- 126 Xinetron X/LAN Station 486SX

Cover photograph by Robert Cardin, digital composition by Varitel Select

Spreadsheets

134 50 Spreadsheet Tips

You've mastered the basics—now join the ranks of accomplished spreadsheet jockeys with these power-packed tips from the pros for *Excel, Quattro Pro*, and 1-2-3 for DOS and *Windows*.

Windows

161 Windows NT: The New DOS?

NT blends the best of DOS and Windows: stability, robust multitasking, better networking, and Windows' familiar interface. Is it finally time to ditch DOS?



178 Word Processor or Desktop Publisher?

The debate: whether *Windows* word processors stand up to low-end desktop publishers for creating simple reports, brochures, and newsletters. We test six packages to find the smart choice.

Top of the News

42 1-2-3 Leapfrogs Excel and Quattro

1-2-3 4.0 for Windows is a winner. For those eager to trade up, the wait is over.

48 In Touch on the Go

Hewlett-Packard's 100LX includes a version of *cc:Mail* for mobile E-mail.

50 HP's LaserJet 4L Makes Itself at Home

For home or office, this compact printer fits right into your work style.

54 cc:Mail for Windows Plays by Your Rules

Now you can tell your E-mail where to go! Automatically forward, store, or reply to messages in version 2.0.

66 How to Survive if Your PC Maker Doesn't

Don't be left unprepared if your PC vendor goes out of business.



212 Caches Pay Off

Hard Disks/Caches

Bundled free with Windows and DOS, SmartDrive can ease the strain of Windows and disk-intensive tasks. But is SmartDrive all you need for top performance? Here's how to figure out if and when other software and hardware disk caches make more sense.

1993 World Class Awards

95 Vote and Win!

Cast your vote for the best hardware and software products on the market, and enter our drawing for \$50,000 worth of state-of-the-art prizes. Fill out the official 1993 World Class ballot and mail it today!



p. 95

188 Databases Come to Windows

A database that's easy to use? That's the preposterous claim of FileMaker Pro, Microsoft Access, Approach, and other new Windows databases vying for your attention. To see if the graphical interface makes it easier to manage information, we review seven newcomers and choose the best for novices and pros.

New Products

- 69 Zeos Contenda and Micro Electronics WinBook notebook PCs
- 70 CompuAdd 450SLC2 486 desktop PC
- 70 Pinnacle RCD-202, RCD-200 CD ROM recorders
- 72 Packard Bell 486 PCs
- 72 Maxtor MXL-105-III, MiniStor MiniPort 42/85 PC card hard drives
- 74 Adobe Photoshop 2.5 for Windows
- 75 MapInfo Maps & Data
- 75 Microsoft Visual C++ 1.0
- 78 Serif PagePlus 2.0 desktop publisher

- 78 Asymetrix Compel 1.0 presentation software
- Polaris PackRat 5.0
- 79 askSam for Windows
- 80 Artisoft LANtastic 5.0
- 84 Quick Takes
- 93 Marketplace

Prices for popular PCs nationwide.

Here's How



- 220 Help Line
- 224 Spreadsheets
- 230 Word Processing
- 236 Windows
- 240 Data Management
- 244 Publishing & Presentations
- 248 Communications
- 250 Hardware
- 254 Star-Dot-Star
- 259 Instant Reference Card DOS 6.0: Utilities

Departments

- 19 In This Issue
- 23 Letters
- 31 Consumer Watch
- 37 Real Problems, Real Solutions
- 293 Business Fixtures
- 297 Games: Break Time
- 300 Home Office

Resources

- 10 PC World Online
- 246 Coming Up
- 265 Fax Survey: Fax us your opinions for a chance to win a CD ROM drive.
- 266 PC World Catalog
- 277 Advertiser Index
- 281 Editorial Product Index
- 282 Mail-Order Shopping Guide

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 ##124669680. Second-class postage paid at San Francisco and additional mailing offices. POSTMASTER: Send address changes to PC World, Subscription Dept., PO. Box 55029, Boulder, CO 80322-5029. Editorial and business offices: 501 Second St. #600, San Francisco, CA 94107, 415 243-0500. Copyright @ 1993, PC World Communications, Inc., Ill rights reserved. The following are trademarks of PC World Communications, Inc.: Consumer Watch, Star-Dot-Star, PC World.

ZEOS PCs are your best choice.

But don't take our word for it:

"...blew all competitors away—in some cases performing more than ten times as fast as competitors."

"ZEOS' engineering and quality advantages... clearly distinguish the ZEOS product from similarly priced machines."

> -Forbes, March 1, 1993

-PC Magazine, January 26, 1993

"An array of features to make a user's mouth water."

-PC Magazine, January "The ZEOS 26, 1993 is the fastest 33-MHz 486-DX system we tested, and its performance even topped that of two "This is a fast, 50-MHz 486DX2s." beautifully designed PC with -PC World, an upgrade path February 1993, Best Buy that just won't quit. That spells Best Buy to us." "Kudos for its excellent -PC World. motherboard design, great performance, and thought-February 1993, ful little extras...These features set the ZEOS Best Buy apart from the crowd." 0 -PC Computing, March 1993,

"...look at ZEOS's new 486DX2-66...
That's value pricing."

Best Value

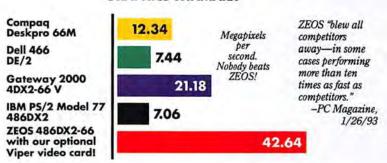
-Jim Seymour, PC Magazine, Feb. 9, 1993

WOW! HIGH-SPEED VESA LOCAL BUS VIDEO!

Local bus is the hottest performance enhancement going. It speeds your computer's performance by allowing peripherals—like video controllers and IDE disk drives—to connect *directly* to the CPU's bus, transferring data at full clock speed.

Your new ZEOS system features two VESA-standard local bus slots. VESA-standard is important—you

PC MAGAZINE LABS BENCHMARK TESTS: GRAPHICS WINMARK





know you won't get stuck with some proprietary architecture that has no future. Check the competition; few meet the standard.

And ZEOS gives you *incredible* local bus video. *PC Magazine* tested a ZEOS system with our optional Viper video card. Their findings? The ZEOS "blew all competitors away—in some cases performing more than ten times as fast as competitors." This same #1-rated blazing Windows performance can be yours. Only from ZEOS!

DATA TRANSFER THAT'S OVER TWICE AS FAST. WITH LOCAL BUS IDE!

We take the same local bus technology and apply it to our built-in IDE drive controller. Your drive will be so fast you'll hardly know it's there! Dell doesn't have it; few others do either. ZEOS has it and so can you.



"IT'S HARD TO IMAGINE A BRIGHTER UPGRADE PICTURE." —PC WORLD

Now you can upgrade from any 486 as your needs change. You get more than just an overdrive socket—you get

upgradability all the way to Intel's Pentium*-based OverDrive* processor. And your ZIF (Zero Insertion Force) socket makes it so easy!

Yet CPU upgradability is only part of the story. Because you also get eight expansion slots, seven of which are open, giving you plenty of room to add to your system later. And you get Flash BIOS, allowing for easy BIOS upgrades in the future by disk or modem! Plus on-board SCSI for only \$49. Add SCSI devices (such as CD-ROM) now or later



and you get high performance onboard SCSI that's very affordable.

"AN ARRAY OF FEATURES TO MAKE A USER'S MOUTH WATER."—PC MAGAZINE

If you spend as much time with your PC as we think you do, you know what a difference high-quality components can make. Such as strong cases, floppy drives by Teac, and .28mm dot pitch SVGA monitors that are non-interlaced all the way up to 1024x768 resolution.

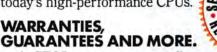
UL LISTING ON THE ENTIRE SYSTEM.

Another rare—and important—symbol of quality is the UL* Listing. We feel it says something about quality as well as safety. And it's *on the entire system*—not just the power supply. Most don't have it. You do.

NOT ONE, BUT TWO COOLING FANS.

While ZEOS systems run cooler than most with just one fan, we still give you two whisperquiet ones. Because the cooler

your system runs, the longer it will last. Particularly with today's high-performance CPUs.



At ZEOS, we support you toll free, 24 hours a day, 365 days a year. Your own ZEOS award-winning Technical Support is only a phone call away—anytime you need us.

And if you're not absolutely



Buy with confidence. We're PC Magazine Readers' Choice for Service and Reliability! ZEOS is the only PC vendor to receive the "Excellent" rating for both desktop and laptop systems.

convinced your new ZEOS PC is everything we say it is and more, you have a full 30 days to return it to us for a complete, no-questions-asked refund. Plus, you're covered by our One Year Limited Warranty, Express Parts Replacement Policy and Complete Customer Satisfaction Package.

FABULOUS FREE SOFTWARE—INCLUDING NEW LOTUS IMPROV!

You get your choice of a popular Windows application from Lotus—1-2-3, Ami Pro, Freelance Graphics, or new Lotus Improv, called the most "revolutionary"

NOW: Larger drives, all with highspeed built-in cache. Up to 452MB!

Choice.

and accessible" spreadsheet ever. That's in addition to DOS 6.0 (plus enhanced tools), Windows, and the fabulous new Lotus Organizer—your own



personal information manager highly recommended by *PC Magazine*. With all the free software you get with your new ZEOS system, you save hundreds of dollars!

IT ALL COMES DOWN TO VALUE.

No one gives you as much as ZEOS. At any price. And quite frankly, in the history of our company, we've never built better PCs than these. That means a lot from a company with *nine PC Magazine Editors'* Choice awards.

SO GIVE US A CALL!

When it comes right down to it, buying a ZEOS is the best purchase decision you can make. So why not give us a call right now and talk with your own friendly and knowledgeable ZEOS Systems Consultant. ZEOS is absolutely your best choice. And we don't just say it. We guarantee it!

800-554-5220

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 Exp, Discover, Z-Card, COD and Leasing programs. Open 24 Hours a Day, 365 Days a Year!

Purchase orders from Fortune 1000 companies, governments and institutions subject to approval. Leasing programs available. All prices and specifications are subject to change without notice. Please call to confirm pricing, specifications and warranty details. All products and company names are trademarks or registered trademarks of their respective holders. © 1993 ZEOS International, Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA. ZEOS is a publicly traded company (NASDAQ symbol: ZEOS.)

UPGR4GT-PCW-9306

NOBODY GIVES YOU THIS MUCH!

#1	#2	#3	#4	DU THIS MUCH!
\$1295	\$1795	\$2195	\$2495	4865X-25
1395	1895	2295	2595	4865X-33
1595	2095	2495	2795	486DX-33
1695	2195	2595	2895	486DX2-50
1795	2295	2695	2995	486DX2-66
				Intel 486 CPU
				ZIF upgrade socket
2	4	8	16	MB of RAM expandable to 64MB on motherboard
107	214	340	452	High-speed IDE hard drive (MB)
32K	128K	128K	256K	Built-in hard drive cache
	•		•	Local bus IDE hard drive interface
16	16	12	12	Seek time (ms)
	•		•	1.2MB Teac floppy drive
				1.44MB Teac floppy drive
				ZEOS 14" high-resolution mono VGA monitor
	•		•	ZEOS 14" high-resolution 1024x768 non-interlaced SVGA color monitor
.28	.28	.28	.28	Monitor dot pitch (mm)
•	-	-	•	1MB high-speed VESA local bus card with Windows accelerator
•	•		•	Eight expansion slots including two VESA local bus
	•		•	Two serial ports, one parallel port
				Shadow RAM/EMS support
•	•	-	•	Sceket for optional on-board SCSI
				Flash BIOS
	•			High-capacity 200W power supply and built-in surge suppression
•			•	ZEOS SpaceSaver case with six drive bays
				Two cooling fans
			•	ZEOS 101-key tactile/click keyboard
		=		Microsoft DOS 6.0 (plus enhanced tools)
		-	•	Microsoft Windows
			•	Microsoft Mouse
	•		•	Choice of Lotus Improv, 1-2-3, Ami Pro or Freelance
				Lotus Organizer
	-		•	24-Hour-A-Day Toll-Free Technical Support
				30-Day Money-Back Guarantee
				One Year Limited Warranty

386SL CONTENDA PACKAGE I:

- CPU: Intel 386SL
- Processor Speed: 25MHz
- Memory: 2MB expandable to 10MB
- Hard Drive: 80MB
- Display: VGA backlit, 640×480, .23mm dot pitch, 256K video RAM, Sharp 7.4" diagonal, up to 64 shades of gray
- Battery: NiMH; operating time up to 4 hours; a snap to remove
- Size: 9.7" x 6.1"
- Weight: Only 3.9 lbs.
- Power Management: Fully featured, including Deturbo, Standby and Suspend to disk
- Keyboard: Comfortable 80-key with embedded numeric keypad I/O Ports: 1 serial and
- 1 parallel standard; ports for optional internal modem, external 3.5" floppy and external color VGA or SVGA monitor
- Pointing Device: Easy-to-use built-in trackball
- Warranties & **Guarantees: ZEOS** award-winning 24-Hour
 Toll-Free Technical
 Support, 30-Day Absolute
 Satisfaction Money-Back
 Guarantee, complete
 Customer Satisfaction **Package**

386SL CONTENDA PACKAGE II:

We take Pkg. I and up-grade to 4MB RAM, add an external 3.5" floppy drive, DOS, Windows and Lotus Organizer!

386SL CONTENDA PACKAGE III:

All of pkg. II plus a nylon carrying case, extra battery, and internal 9600/2400 baud fax modem. The whole enchilada for less than \$2000!

Your ZEOS® Now with 386SI

"...if you're looking for a subnotebook and want to make next to no compromises, then the \$1495 ZEOS Contenda is your best bet."

-PC Week, February 1, 1993

PC Week calls the ZEOS Contenda "the best vet of the new crop of lightweight, full-featured machines." We weren't satisfied with "best yet"so we've made it even better. Because now you get your choice of a 386SL or 486SL CPU!

FEATURES THAT PULL NO PUNCHES.

Start by checking out the 386SL. The specs are on the left. It's impos-

sible to find a notebook on the market today that's this light, this small, this affordable—and still gives you so much power. But it's all here.

For instance, there's the smart SL processor. According to PC Magazine. when it comes to notebooks, look for Intel's SL processor. The ZEOS

Contenda's CPU extends your battery life significantly—because it's intelligent enough to power-down the memory. disks, modem and more when they're not in use.

What's more, its your feet. features make it a pleasure to use. Such as a crisp, vibrant VGA backlit screen. A built-in track ball. Enough power and memory to easily run Windows. And at less than 4 pounds in weight, it's probably lighter than your briefcase!

Smaller than a notebook. bowerful as a desktop. At only 3.9 lbs., the ZEOS Contenda keeps you light on



Contenda:[™] or 486SLCPU!

486SL OR 386SL: IT COULD BE THE ONLY PC YOU'LL EVER NEED!

The 486SL gives you everything the 386SL version does, plus a few choice enhancements: 3.3 volt technology for added battery life, extra video RAM, PI local bus for Windows acceleration, and a high-speed

floppy drive controller.

Take your pick. You'll find both Contendas give you the power and room for practically everything you'd use in a desktop system. You can easily run DOS, Windows and Windows applications. And you can get all three—including the new Lotus Organizer—the personal information manager that's so easy to use, it could make your Day Timer obsolete. Check out our upgrade packages for details. Then give us a call!



YOU GET CUSTOMER SUPPORT THAT'S THE BEST IN THE BUSINESS.

Our relationship with you doesn't end once we ship your Contenda. ZEOS pioneered comprehensive customer support, and it's what keeps our customers coming back again and again. We back all of our products with Toll-Free Technical Support, 24 hours a day, 365 days a year.

And we guarantee your satisfaction. If you're not absolutely convinced your new ZEOS Contenda is everything we say and more, you have a full 30 days to return it to us for a complete, noquestions-asked refund. Plus, you're covered by our One Year Limited Warranty and much more. You're going to be very satisfied. We guarantee it!

CALL NOW TOLL FREE 800-554-5220

Fax: 612-633-1325 Govt.: 800-245-2449 Hearing Impaired (TDD): 800-228-5389. Outside U.S.

and Canada: 612-633-6131. MasterCard, VISA, AmEx, Discover, Z-Card,[™] COD and affordable leasing programs. Open 24 Hours A Day, 365 Days A Year!



All products and company names are trademarks or registered trademarks of their respective holders. © 1993 ZEOS International, Ltd., 1301 Industrial Blvd., Minneapolis, MN 55413 USA, ZEOS is a publicly traded company. (NASDAQ symbol: ZEOS). SN2-PCW-9306.

Circle 260 on reader service card

486SL CONTENDA PACKAGE I:

- CPU: Intel 486SL operating at 3.3v
- Processor Speed: 25MHz Intel's PI local bus for
- video acceleration!
- **Memory: 4MB operating** at 3.3v
- Hard Drive: 80MB
- Display: VGA backlit, 640×480, .23mm dot pitch, Sharp 7.4" diagonal, up to 64 shades of gray
- 512K 3.3v video RAM Local bus video controller
- operating at 3.3v Battery: NiMH; operating time up to 5 hours with power management
- Size: 9.7" x 6.1"
- Weight: Only 3.9 lbs.
- Power Management: Fully featured, including Deturbo, Standby and Suspend to disk
- Keyboard: Comfortable
 80-key with embedded
 numeric keypad
 1/O Ports: 1 serial and
 1 parallel standard; ports
 for optional internal 3.5" modem, external 3.5" floppy and external color VGA or SVGA monitor
- Pointing Device: Easy-to-use trackball
- Warranties and Guarantees: ZEOS award-winning 24-Hour Toll-Free Technical Support, 30-Day Absolute Satisfaction Guarantee, complete Customer Satisfaction Package

486SL CONTENDA PACKAGE II:

You get all of Pkg. I, plus external floppy, DOS Windows and Lotus Organizer!

486SL CONTENDA PACKAGE III:

We upgrade Pkg. II to 8MB of RAM—and add a custom-fitted nylon carrying case, additional battery and fax/modem. Perfect for road warriors!

PC WORLD

EDITOR IN CHIEF Philip Lemmons

EXECUTIVE EDITOR Russell Glitman MANAGING EDITOR Cathryn Baskin ART DIRECTOR Mitch Shostak

SENIOR EDITORS

Features Steve Fox Reviews Owen Linderholm

EAST COAST EDITOR Randy Ross (617/422-8020)
SENIOR EDITOR, NEWS Joe Abernathy

EDITORIAL

Assistant Managing Editor Anne Kandra
Technical Editor Karl Koessel
Associate Editors Rex Farrance, Bronwyn
Fryer, Roberta Furger, Bryan Hastings,
Lincoln Spector
Assistant Editors Jeff Bertolucci, Michael
Desmond, Anita Hamilton, Dan Miller,
Melissa R. Riofrio, Christina Wood
Assistant Technical Editor Shane Rau
Assistant Editor, East Coast Laurianne
McLaughlin
Editorial Assistant John Goddard
Editorial Intern Richard Melville
Fact Checker Caroline Jones

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

Assistant to the Editor in Chief Cynthia Grossman Administrative Assistants Ken Blaylock, Amanda Lewis

Business Manager Scott Danish Librarian Stella Chan

ART & DESIGN

Associate Art Directors Robert Kanes, 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, Scott Dunn, Thom Foulks, Brett Glass, Michael Goodwin, Judy Heim, Richard Jantz, Eric Knorr, Robert Luhn, Celeste Robinson, Richard Scoville, Ralph Soucie, Scott Spanbauer, Daniel Tynan, John Walkenbach

Founder David Bunnell Founding Editor Andrew Fluegelman

PC WORLD ONLINE

Director/System Operator Jim Moody (PC World Online, PCW JimM; CompuServe, 71154,212)

Manager, Online Services Bundy Chanock (PC World Online, PCW BundyC; CompuServe, 71333,16)

PC WORLD TEST CENTER

Director Gregory Smith Senior Performance Analysts Dean Andrews, Thomas Grubb

Performance Analysts Ulrike Dichlmann, Susan Silvius

Coordinator Dawn Furseth

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

PC WORLD LOTUS EDITION

Executive Editor Eric Bender
Senior Associate Editors Richard Cranford,
Carrie Thomas

Associate Editors Cynthia G. Fitzgerald, Ann Kremers, 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 ALLIANCE PRODUCTS DIVISION

Vice President Jean Criss
Marketing Director Elizabeth Tucker
Art Director Melissa Holmes
Account Executive Wayne Silverman
Project Coordinator Carla Blakely

LOTUS NEWSLETTER DIVISION

Editor in Chief Jennifer J. Smith Production Manager Andrew Ochrymowych

MULTIMEDIA WORLD SPECIAL SECTION

Publisher Jonathan Epstein
Editor In Chief Craig LaGrow
Art Director Adrian Morgan
Senior Editor, News and Reviews Paul
Worthington
Copy Editor Cynthia Klein
Western Advertising Sales Manager
A. G. Germano (415/978-3221)
Eastern Advertising Sales Manager
Isabelle Kane (617/361-4246)
Sales Assistant Janett Kennedy
(415/978-3208)
Office Manager Paul Fitzgibbon

MULTIMEDIA SECTION MAILING ADDRESS

501 Second St., San Francisco, CA 94107 Phone: 415/281-8650 Fax: 415/281-3915 America Online: MPC World CompuServe: 75300,2503 MCI Mail: MPC Prodigy: KAMD36B

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 PC World Online: see instructions below CompuServe: 74055,412 MCI Mail: PC World Editorial or 179-3813 Internet: 1793813@mcimail.com

LETTERS TO THE EDITOR

Address editorial correspondence to *Letters to the Editor*: Be sure to include your name, city, and state. We reserve the right to edit all letters.

HELP WITH YOUR PC HARDWARE AND SOFTWARE

Send questions about PC products and procedures to *Help Line*. Send consumer-related questions and complaints to Roberta Furger, *Consumer Watch*.

READER SUBMISSIONS

Send us your technical solutions. We pay \$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, and \$50 for questions used in the *Here's How* section. 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 or call 415/978-3212.

SUBSCRIPTION SERVICES, ADDRESS CHANGES

For PC World, PC World Lotus Edition, and the Multimedia World Special Section: 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.

REPRINTS AND PERMISSIONS

You must have permission before reproducing any material from PC World, PC World Lotus Edition, and the Multimedia World Special Section. To quote from or reprint any portion of any article or 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 415/978-3162. To order reprints of your company's editorial coverage in the Multimedia World Special Section, send a written request including your address and phone number to Paul Fitzgibbon, Multimedia World Special Section, 501 Second St., San Francisco, CA 94107, or call 415/267-1755.



You can contact the editors by sending electronic mail to the PC World Online area of America Online. The area features electronic access to the latest issue of PG World and PC World Lorus Edition, a database of back issues, new product announcements, a library of software utilities and index files, and message boards and conferences. To obtain a free America Online starter kit, call 800/827-6364, ext. 6138.

- Intel 33-MHz 386SXTM CPU
- Upgradeable to i486SXDX 2-MB RAM
- (expandable to 16-MB) 60-MB Hard Drive
- (other drives available) Integrated SVGA
 MS-DOS 6.0





- Upgradeable to i486DX2
- 2-MB RAM (expandable to 16-MB)
- 80-MB Hard Drive (other drives available)
 Integrated SVGA
 MS-DOS 6.0
- Windows 3.1 •ALR Mouse

- Intel 33-MHz i486DX CPU Upgradeable to i486DX2 4-MB RAM (expandable to 36-MB)
- 32-Bit Memory Data Path 170-MB Hard Drive (other drives available)
- Integrated SVGA Super VGA Monitor





- Intel 33-MHz i486DX CPU Upgradeable to i486DX2
- 8-MB RAM (exp. to 32-MB)
- 256-KB Cache 240-MB HD
- Integrated SVGA Super VGA Monitor
- 12 Drive Bays
- 10 ISA Expansion Slots

Fastest... Most Powerful... Best Value... Winner... it seems like editors are always saying the same things about our PCs. But who can blame them for being repetitive, especially when you look at the new generation of ALR systems.

And it's not just our systems that have won industry praise. We've created a service and support program that PC World described as being "among the best." Our unique five year/fifteen month limited

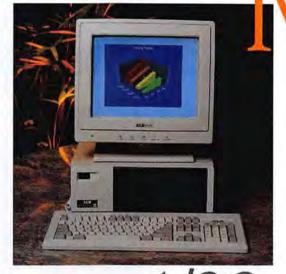
factory warranty delivers an unheard of five years of security. We even cover systems purchased through ALR's PrimeLine Direct with a 30-day money back

guarantee, so you know you can buy with complete confidence!

"It's really fast and the service is impeccable...

Introducing the ALR

VOL



VESA VL LOCAL BUS

With its VESA VL local bus, powerful i486 processing, and finely tuned 32-bit architecture, this remarkable system sets a new standard for desktop performance and compatibility. Two VESA VL extensions work with the Evolution IV's six ISA (or available



Video Performance Under Windows i486DX2/66 CPU, Winmarks V.2.5, High Score Wins

EISA) slots to provide twice the data path and three to four times the speed of the ISA bus alone. VESA compliance guarantees compatibility with a variety of third party local bus enhancements (video adapters,

disk controllers, etc.), while adaptability to future applications is enhanced by a single chip upgrade path to Pentium processing. A third local bus slot, ALR's CL extension. accommodates the innovative ALR TriCombo™ board. This unique option combines local bus cache and video with high performance Ethernet networking capabilities.



33-MHz i486SX™ CPU i486DX™ UPGRADEABLE Plus 66-MHz i486DX2TM & PENTIUMTM Technology

4-MB RAM (Upgradeable to 52-MB)

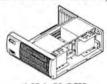
170-MB IDE Hard Drive



SVGA Monitor



2 VESA VL & 1 CL LOCAL BUS SLOTS.



6 ISA SLOTS 6 DRIVE BAYS

MS-DOS® 6.0. MS-WindowsTM 3.1 ALR Two-button Mouse

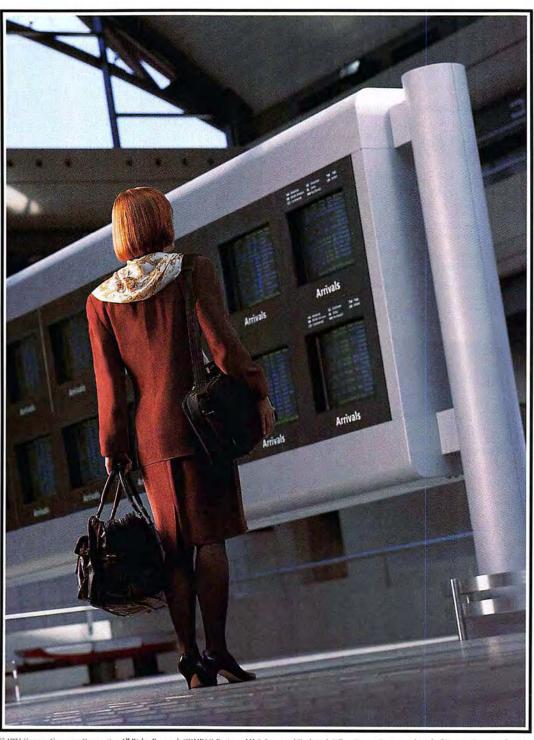
9401 Jeronimo Irvine, CA 92718 (714) 581-6770 FAX: (714) 581-9240 800+444+4ALR

M-F 7AM-5PM SAT. 7AM-1PM PST



 Optional One Year On-Ste Service for as little as \$9.95 applies to selected models only. Ve ALR is a registered frademark of Advanced Logic Research, Inc. Intel Inside logic is a tradem Prices and configurations are subject to change without notice. Verify competitive pricing with manufacturer, Prices based on U.S. dollars and product notices are trademarks or registered trademarks of their respective owners, 0.1993 by Advanced Logic Research, Inc.

WHY NOTEBOOK DESIGN IS AND AIRPORTS AS IT IS ABOUT



© 1993 Compaq Computer Corporation. All Rights Reserved. COMPAQ Registered U.S. Patent and Trademark Office. CompaqCare is a trademark of Compaq Computer Corporation. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. Photo courtesy of Pittsburgh International Airport.

As Much About Hotels Modems And Motherboards.

There are two ways to design a notebook PC: around a computer chip, or around a human being. And if you've used a Compaq, you undoubtedly know which of these approaches best describes our philosophy.

Now, of course, we at Compaq embrace innovative technology as much as anybody. We just don't think it serves much purpose without a thorough understanding of how people use it.

Which is why we look at airplane seats and hotel rooms as closely as circuit boards and serial ports. It is precisely this approach that enables us to build some of the most durable, reliable and useful notebooks on earth.

Notebook PCs with

uniquely sophisticated power conservation tools so you get longer use out of the battery. Full-sized keyboards with familiar "hotkey" commands. And easy-to-read screens that rival the display quality of desktop systems.

Of course, even highly sophisticated features are worthless if they can't endure the punishment of daily use.

Which is why we subject our notebook PCs to testing that others simply couldn't withstand. We drop them. We bake them. We freeze them. We even test new COMPAQ designs by opening and closing them ten thousand times to simulate years of normal use.

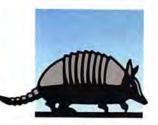
In short, we engineer our award-winning note-books for the real world.

A place that's filled with deadlines and flight cancellations and overhead storage compartments.

A place that can teach you as much about how to design notebooks as any computer lab on earth.



A help line that withstands the test of time. You can call our free 24-hour hotline seven days a week for as long as you own your computer.



Like the armadillo, Compaq notebooks feature built-in protection against the elements. In fact, our ruggedly engineered notebooks are among the most durable on earth.

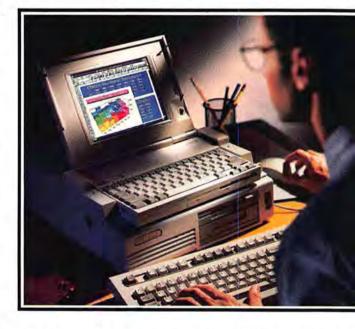


THE COMPAQ LTE LITE. FOR THEIR TIME WORKING. AND

OK, we're not saying you live on three hours of sleep, or that you eat Chinese takeout every night. And even if you do, we're not saying that a COMPAQ LTE Lite 486SL notebook is suddenly going to change all that.

What we will say is that it could make your life a lot simpler. Particularly if you travel.

You see, on one hand, these new computers are lightweight, compact notebooks (6.3 pounds, 8.5" x 11"). They're available with three different screens: the COMPAQ UltraView – the world's only



black and white, active matrix VGA; a 256-color active matrix; and the highly acclaimed passive monochrome MaxLight.

> Simply slide the LTE Lite notebook into the COMPAQ Desktop Expansion Base and you have a full-function, fully connected desktop computer.

There's the integrated EasyPoint trackball. And each has a range of innovative power-conservation features to help extend battery life.

But what also makes these notebooks unique is

© 1993 Compaq Computer Corporation. All Rights Reserved. COMPAQ and LTE Registered U.S. Patent and Trademark Office. UltraView, MaxLight, EasyPoint, Enhanced QuickConnect, CompaqCare and SpeedPAQ are trademarks of Compaq Computer Corporation. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. The Intel Inside Logo is a registered trademark of the Intel Corporation.

PEOPLE WHO SPEND HALF THE OTHER HALF WORKING.

that they double as fullsized, full-featured 486 desktop PCs.

By simply sliding your LTE Lite notebook into bays increase expansion capabilities. Best of all, you're using the same hard drive. So whether you're in the office or on

easy connection to your peripherals, choose the new Enhanced QuickConnect — a one-step system with integrated Ethernet and SCSI support.

And like all of our PCs, these notebooks are backed by CompaqCare. Which includes a free, three-year worldwide warranty, and a year of free on-site service in the U.S. or Canada.

For more information about the COMPAQ LTE Lite 486SL notebooks, call 1-800-345-1518. Because if you work out of the office on a regular basis, you really lead two lives. So they're perfect for you. And you.



Unlike other 486 chips, the Intel 486SL, with an integrated numeric coprocessor, provides higher performance and extended battery life.



No wires, no interface boxes, no headaches. The optional fully integrated COMPAQ SpeedPAQ 144 Modem connects the LTE Lite directly to a cellular phone so you can send e-mail and faxes.



the COMPAQ Desktop
Expansion Base, you're
instantly connected to
printers, peripherals and
your network. No floppies, no fumbling with
wires, no headaches. And
the extra slots and drive

the road, your files are always with you. The expansion base also offers you a keylock to secure your notebook.

Of course, if you don't need all the functions of a full-sized PC, but want COMPAQ

^{*}This service is provided by Contracted Service Providers and may not be available in certain geographic locations. Certain restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. For further details on our limited warranty, contact the Compaq Customer Support Center.

COMPAQ CONTURA. THE AFFOR LEAVE YOU WISHING YOU

Buying some low-priced 486 notebooks is like buying a bottom of the line car. You drive off without power steering or air conditioning or even floormats. If you get away with an AM radio, you've pulled off a coup.

> At Compaq, however, we believe an affordable notebook shouldn't merely be the stripped-down, bare-bones version of a more expensive one.

Take the new 486SL Contura notebooks.

Although affordably priced, they're COMPAQ computers in the truest sense. They endure the



same torturous testing as every other computer

that we build.

Inside there's an Intel 486SL chip. Unlike the

4/25CX: Active color VGA * Integrated EasyPoint trackball * NiMH battery * 4/25c: Advanced passive color VGA * COMPAQ Trackball * NiMH battery * 4/25: Monochrome VGA * COMPAQ Trackball * Enhanced NiCd battery All models: Intel 25MHz 486SL with 8K cache and numeric coprocessor * 4MB RAM (up to 20MB) * 120MB or 209MB hard drive * Preinstalled Microsoft Windows 3.1 and MS-DOS 5.0 as published by Compaq \$1,999

486SX chip in comparably priced notebooks, this one has an integrated coprocessor. And it runs more efficiently, helping to extend battery life.

You have your choice of three Contura screens, all of which offer razorsharp definition. There's an active matrix screen that displays information in 256 colors. There's an advanced passive matrix color screen that offers 50% better contrast, and 33% improved response time over earlier passive technology. And there's a crisp and clear monochrome version as well.

The COMPAQ
Contura 4/25CX

comes with an

EasyPoint trackball
that eliminates the need
for a mouse. And all of
the Contura models offer
a unique feature called

© 1993 Compaq Computer Corporation. All Rights Reserved, COMPAQ Registered U.S. Patent and Trademark Office, Contura and EasyPoint are trademarks of Compaq Computer Corporation. Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies. The Intel Inside logo is a trademark of the Intel Corporation. PC LapPap Computer Magazine, January 1993. Estimated U.S. reseller selling price. Reseller pricing will vary.

DABLE NOTEBOOK THAT WON'T COULD AFFORD MORE.

Hibernation. This allows you to shut your PC off quickly without losing brings you right back to where you were.

Contura notebook PCs

an hour. And a variety of modem options, including cellular, allow you to send and receive data and faxes anywhere.

All of which explains why the editors at PC LapTop Computers Magazine recently named our Contura the best value in notebook computers.

more, give us a call at 1-800-345-1518,

If you'd like to know

and ask us

about

Contura.

The notebook PC designed to accommodate your budget limitations, not constantly remind you of them.

Thanks to our advanced graphics ac-

Thanks to our advanced graphics accelerator, Contura blows the doors off most other Windows notebooks. In fact, it runs Windows 30% faster than most 486 machines:



Nothing is backed like a Compaq because nothing is built like a Compaq. Contura includes a free three-year, worldwide warranty with a year of on-site** service in the US or Canada.

COMPAQ

any data, and marks the spot where you left off. When you start your PC up again, it automatically

also come with
an external battery charger that lets you recharge

"In tests run by Compaq using PC Magazine Labs WinBench Release 3.1. "This service is provided by Contracted Service Providers and may not be available in certain geographic locations. Certain restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. For further details on our limited warranty, contact the Compaq Customer Support Center.

Now Windows is as easy to use as DOS.

Microsoft" Windows" is capable of great and wonderful things.

But if you're among the many who've traded the frustration of the C: prompt for the graphical confusion of Program Manager, relax.

You're about to discover what half a million delighted DOS" and network users already know.

That the shortest distance

between you and your programs is straight through Direct Access."

It's the world's best-selling menuing software. And as soon as you install it you'll understand why.

Direct Access searches your disk, gathers your programs into logical groups and builds menu screens just like the one you see at the top of this page.

All by itself.

That's right. You just load it and forget it.

Whenever you want an application, all you have to

Direct Access, on the other hand, gives you a multitude of utterly sensible program groupings — 17 of them.

And that doesn't count the customized ones you dream up yourself.

What does all this mean to you?

It means you can get to a spreadsheet by simply clicking "Spreadsheet." Sum-



Direct Access searches your bard disk, groups your applications logically and generates menus and submenus automatically. All you bave to do is point and click.

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

You can even park your favorite programs right on the main menu and ask for them by name.

Hey, we didn't call it Direct Access for nothing.

If the only PC you're responsible for is the one on your desk, Direct Access is valuable, indeed.

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

Suddenly all of your Windows and DOS users can follow the same quick, convenient route to their applications.

And if all those PCs are networked, so much the better. Because you can install — and customize — Direct Access on everybody's workstation without leaving yours.

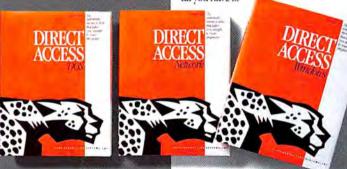
You can decide for yourself precisely who gets access to which menu items.

And prevent novice users from even *looking* at DOS.

There's more. A lot more. So pick up the phone. Dial 1-800-388-0362.

We'll tell you about our one-year money-back guarantee and our vaunted toll-free customer support.

Which you can access directly, 24 hours a day.



do is hit one key.

Or, if you prefer, click one mouse.

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

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

Not very intuitive, eh?



Choices on the Desktop

ith the announcement of Windows NT, Microsoft has given you a wider choice of desktop systems than ever. Along with Intel's 486 family and its formidable new Pentium chips, Digital Equipment's Alpha PC and Acer's MIPS R4000 PCs are platforms for NT. Cyrix and AMD are also hastening to market with high-end 486-compatible processors. The power of such chips to run PC software, like Pentium's, will encompass the world of Windows NT and extend to DOS applications and utilities as well.

Two things must happen to make moving to NT on Alpha or MIPS PCs worthwhile. First, all the major Windows applications must be made available for these systems. Second, the Alpha and the MIPS must show a decisive edge in performance over Intel-compatible PCs—decisive enough to entice people to give up backward compatibility with the host of utilities and applications for DOS and Windows 3.1.

We are working around the clock to assess the new NT processors, trying as always to measure real-world performance by testing with software that you buy and use.

Windows Versus Windows

Though Microsoft is the catalyst for bringing the Windows world a broader choice of CPUs, who will give us an alternative to Windows? IBM and Apple are the most promising challengers. But their Taligent joint venture will come too late. They need to act now.

IBM could restart the game by dropping the obscure and never-popular name OS/2 in favor of IBM Windows. The FTC has ruled the term Windows generic, noting its wide use before the announcement of Microsoft Windows. Some companies, notably Quarterdeck, have never accepted or acknowledged Microsoft's ownership of the term.

Such a move by IBM would not mis-

lead the computing public—IBM Windows does run Microsoft Windows applications. The time is ripe for a contest of merit—plain old competition.

Apple's opportunity to challenge Microsoft is even greater, because the most significant weakness of Microsoft Windows remains its user interface. If Apple transplanted its Macintosh operating system to the PC, Apple could win perhaps one-third of the desktops in North America within a year. But Apple can't do

that, some say, because it would hurt Macintosh sales.

To the contrary: Apple's risk is greater if it fails to put millions more copies of the Macintosh operating system on PC-compatible desktops. This scenario is the most likely way for Apple to keep developers writing Mac applications rather than ignoring the Mac and focusing exclusively on Windows. All of the major Mac applications are moving to Windows anyway; witness Quark-XPress and Photoshop. This migration is sure to hurt Mac sales and Apple revenues.

The best strategy for Apple is to propagate the Macintosh operating system and seize a share of the vast revenue in the PC software market. Apple can surely make PCs easier to use and yet continue to integrate its own hardware and user interface so well that the Mac will remain an attractive hardware platform.

More Application Choices

In other coverage this month, Scott Spanbauer sizes up Windows NT for 1993 and the future in his article "Win-



dows NT: The New DOS?" Top of the News takes an in-depth look at the new 1-2-3 release 4.0 for Windows. Richard Scoville and Randy Ross

PC World

Editor in Chief

Phil Lemmons

spent time with that product to determine whether Lotus has eaught up with its archeompetitors in *Windows* spreadsheets, Microsoft and Borland. The news is good for spreadsheet wizards and businesspeople everywhere.

As with spreadsheets, the database competition for Windows is fierce. Our review "Databases Come to Windows" covers outstanding products from several vendors, including Microsoft and Borland.

As application choices broaden, hardware choices also keep getting better and cheaper. Our system review this month looks at 25 low-cost desktop 486s, some of which we expect to crash the \$1000 barrier by the time you receive this issue.

Phil Lemmons, Editor in Chief

HELE CLEMENT



Sure, Any Spreadsheet Can Do The A,B,C's. Improv Has Mastered English.

IMPROV® FROM LOTUS® DOESN'T WORK THE WAY YOU EXPECT. INSTEAD, IT ACTUALLY WORKS THE WAY YOU THINK. IN PLAIN ENGLISH.

NO MORE TRANSLATING BUSINESS MODELS INTO CRYPTIC LITTLE FORMULAS. NO MORE CELL ADDRESSES LIKE "B23"

AND "C10." BECAUSE THE IMPROV SPREADSHEET IS DIVIDED INTO CATEGORIES AND ITEMS LIKE "QUARTER 4" AND "REVENUE."

SO IF YOU WANT TO ENTER A FORMULA TO CALCULATE GROSS MARGIN YOU JUST TYPE IN "GROSS MARGIN=REVENUE—

COST OF GOODS" OR POINT AND CLICK ON THOSE ITEMS AND CATEGORIES.

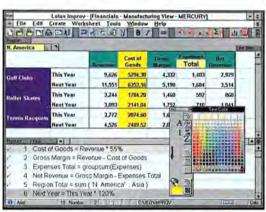
BUT THE ENGLISH LANGUAGE FORMULAS DO A LOT MORE THAN MAKE IMPROV MORE NATURAL TO WORK WITH. SINCE THEY'RE NOT CELL ADDRESS-BASED (B5+C6-D5), THEY CAN EASILY BE APPLIED TO MANY CELLS AT ONCE.

WHICH MAKES IT EASIER TO EXPAND YOUR MODEL AND HARDER TO MAKE ERRORS, WHEN MANIPULATING YOUR WORKSHEET.

AND WITH ALL LABELS AND FORMULAS EXPRESSED IN ENGLISH,
THE SPREADSHEET IS TOTALLY SELF-DOCUMENTING. SO ANYONE CAN
TURN TO IT AT ANY TIME AND UNDERSTAND THE LOGIC BEHIND IT.

ALL OF WHICH STILL CAN'T UPSTAGE THE NEWS THAT IMPROV IS THE WORLD'S FIRST DYNAMIC SPREADSHEET, AND THAT WILL LITERALLY CHANGE THE WAY YOU LOOK AT SPREADSHEETS.

WITH ITS DYNAMIC VIEWS, IMPROV LETS YOU ROTATE, HIDE, SHOW, COLLAPSE, SLICE, DICE AND EXPAND WORKSHEETS IN WAYS NO TRADITIONAL SPREADSHEET CAN. SO RATHER THAN SPENDING



LOOK, EVERYTHING IS IN ENGLISH. YOU'VE JUST SEEN IT AND ALREADY YOU CAN UNDERSTAND THIS SPREADSHEET

HOURS RECONSTRUCTING WORKSHEETS TO GAIN NEW PERSPECTIVES, YOU JUST DRAG AND

DROP A CATEGORY TILE WITH YOUR MOUSE. THE NEW VIEW IS CREATED ON THE SPOT.

WITH IMPROV, LOTUS TAKES THE WINDOWS™ PLATFORM BEYOND THE VISION OF ANY OTHER SOFTWARE DEVELOPER.

TO PUT IT IN PLAIN ENGLISH, INFOWORLD SAID "SERIOUS SPREADSHEET USERS...OWE IT TO THEMSELVES TO GET A COPY OF THIS \$495 PACKAGE." ESPECIALLY SINCE, FOR A VERY LIMITED TIME, IMPROV FOR WINDOWS IS ACTUALLY AVAILABLE AT AN INTRODUCTORY PRICE OF

JUST \$99? HOWEVER, ON JUNE 1, 1993, THE PRICE DOES RETURN TO \$495.3

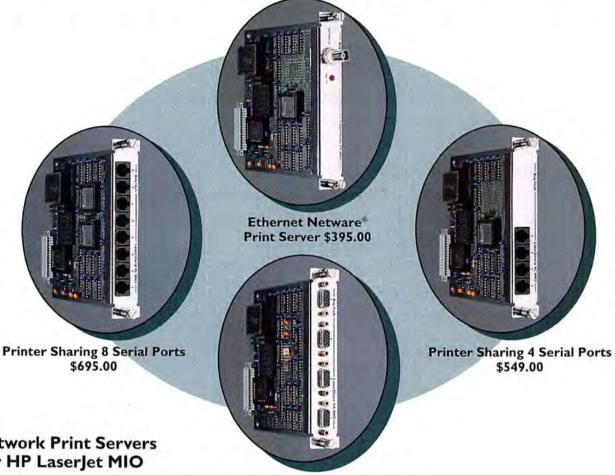
TO ORDER, CALL US DIRECT AT 1-800-872-3387, EXT. 8772, OR VISIT YOUR LOCAL LOTUS AUTHORIZED RESELLER.



WHILE SUPE



HP Connectivity More Affordable, Faster Performance



Network Print Servers For HP LaserJet MIO

BayTech has combined performance and affordability in the new Ethernet print server card. The LaserShare® PS-MIO easily installs into the MIO slot of your HP LaserJet Series 4, IIISi and 4Si laser printers.

The three key advantages LaserShare PS-MIO has over standard network printing are: speed, printer location, and congestion reduction. The fast throughput speeds allow downloading of large text and graphic files at the speed of your network. It increases file server efficiency by assuming the printing functions of the file server. You can locate your laser printer anywhere on the Novell Netware® 3.x compatible network by using either 10BASE2 or 10BASE-T connections.

For only \$395.00 it is the best low cost, high performance print server available.

8 Can Share Your Laserlet

BayTech is pleased to offer a more diverse LaserShare product line with the inclusion of MIO expansion cards.

Printer Sharing 4 Parallel Ports \$549.00

\$50.00 Rebate on LaserShare® MIO Purchase a LaserShare before August 31, 1993 and receive a \$50.00 rebate.

LaserShare allows up to 8 users to connect simultaneously to the MIO expansion slot of your HP LaserJet laser printer. LaserShare models are available with 4 parallel ports, and 4 or 8 serial ports. LaserShare's standard 1MB buffer is user expandable to 4MB. The LaserShare 4A-MIO is the only 4 parallel port card available for HP LaserJet MIO products.

Parallel input speeds of 70Kcps are the fastest in the industry. Use BayTech's Tran-x® for parallel printing, with serial port models, for distances more than 1,000 feet and speeds to 46Kcps.

Experience & Reliability

For 17 years, BayTech has been a leader in the design and manufacture of

Circle 95 on reader service card

data communication products including: Network Print Servers, Printer Sharing Solutions, Statistical Multiplexers and Data Acquisition Controllers. Call tollfree today to learn more about BayTech connectivity products.

All product or company names are trademarks of their respective holders.

Because Resources Should Be Shared



Data Communications Products Division 200 N. 2nd St., PO Box 387, Bay St. Louis, MS 39520 Fax: 601-467-4551 Phone: 601-467-8231 or toll-free

800-523-2702

How New Is New Software, the Hard Drive Dispute, Art and Taxes

What Planet Are You From?

was rather surprised by your claim in "Is Your New Software Secondhand?" [March] that retail stores have liberal return policies for software. In my experience, the opposite is true.

The question, "What other industry lets you take home a \$500 item, use it for 30 days, then return it for a full refund if you're not satisfied?" is particularly ludicrous. Almost every industry I know of allows returns of big-ticket items. The article then compares software to movies, books, and music. Exactly what planet do you live on? I've never paid more than \$25 for a cassette tape or CD, or over \$30 for a movie, or over \$100 for a book. How do such items compare to a \$500 one?

The real problem is that in most instances buyers are not allowed to sample software before they purchase it. This restriction poses a severe problem for people who are forced to make software purchases based on reviews in magazines and little pictures on the back of the box.

Rick Vineyard, Springfield, Illinois

Editor's response: The sidebar "Many Happy Returns" compared return policies on various kinds of copyrighted materials. You're right-software is considerably more expensive than most books or CDs. Still, the rules governing software returns are more analogous to those for other (albeit less expensive) types of intellectual property than they are to big-ticket items, such as stereo or computer equipment, that are not governed by copyright laws.

Your call for the opportunity to testdrive software is well taken. Although some stores have demo PCs on which sales staff will install software you're considering purchasing, the practice is not yet commonplace. Such demo stations would go a long way toward helping people make more informed buying decisions-and thus cut back on software returns. -Roberta Furger

Sterilized Software

was disgusted-although not surprised—by the information I read in "Is Your New Software Secondhand?" Stores shouldn't return disks to the shelf that have been in another machine. I'd like to ask software retailers a question: I prepare IV needles in a hospital. If I promised you that I sterilized a previously used needle, would you approve of my sticking

you with it? Kenneth E. Henson, Fort Campbell, Kentucky

Two out of Three Isn't Good

read the article "Is Your New Software Secondhand?" with real interest. Your timing was perfect, because I just had the experience of buying previously opened software. I pur-

chased a copy of XTree Gold, which does not come shrink-wrapped because-I believe-XTree Company is trying not to add to the massive amounts of plastic waste we generate. After I opened the package, I discovered that the disk envelope had already been torn open.

When I returned the package for an exchange, the store manager and I agreed that I should open the next package in the store. This package also had been tampered with. The third package that I opened was okay. Two out of three packages strikes me as an awfully high number from a store that claims all returned software is sent back to the vendor.

Dan Coppock, Novato, California

In the Back of the Store

The article "Is Your New Software Secondhand?" reminded me of a recent visit I made to a software retail store. My son needed to answer the call of nature, and a sales clerk directed us to the rear of the store. On a table we noticed a large stack of opened software. Next to it stood a shrink-wrap machine. Is it possible that the software wholesaler requires that all returned software be shrink-wrapped before it's shipped back to them?

Steve Firestone, Van Nuys, California



And Hardware, Too

V our secondhand-software article was interesting, but software isn't the only area that needs to be monitored.

Last year I bought a printer-shrinkwrapped. When I got it home, I found no instruction manual and no instruction disk. The printer was covered with greasy fingerprints, and one of the printer cartridges was open and mangled.

I took it back to the store and waited 30 minutes while someone verified the box's contents. The manager said he couldn't refund my money because "the manual and disk are missing, the printer is dirty, the carrying case is missing (I had overlooked that omission), and one print cartridge is damaged." When I pointed out that these were the very reasons I was returning the unit, he said, "Oh, it must have been returned." After I hassled with him for another 30 minutes, he finally gave me a refund.

Bob Moore, Lakewood, Colorado



Pundit Speaks Truth

t seems as if I have been reading *PC*World since the beginning of time. But
Lincoln Spector's article "Tips to Organize
Your Hard Disk" in the March issue is the
first instance in my memory where any PC
pundit has recommended what became
obvious to me only after several attempts at
organizing hard disks: Data files should be
segregated from programs, either in their
own branch of the directory tree or on their

own disk or partition. I applaud Lincoln Spector for saying so in a public forum. Rob Kirkland, via CompuServe

But Can He Count?

n his March article "Tips to Organize Your Hard Disk," Lincoln Spector notes that "You can't put DEC_SMITH.WK1 in both your C:\DATA\Q4 and your C:\DATA\ SMITH directories." As a matter of fact, you can't put that file in any directory. Or has Lincoln Spector discovered a secret way that he can manage to cram nine letters into a standard DOS file name?

Howard L. Kusnetz, Houston, Texas

As Much Fun as Flat, Warm Soda

incoln Spector's article "Tips to Organize Your Hard Disk" was about as useful as a can of Pepsi left open overnight in the summer. To add to my misery, the sidebar "Lincoln's Favorite File Organization Tools" reads like some copywriter's dream rather than a "grizzled PC World veteran's" sincere efforts to educate. Words like incredible, slick, and coolest are better off elsewhere (guess where?).

Imran T. Ahmed, Fairfax, Virginia

Magellan Fan Club

very much enjoyed reading "Tips to Organize Your Hard Disk." I was especially pleased to see that Lincoln Spector is a fan of *Magellan*. I too am a fan and have been touting this program since shortly after its release.

I called Lotus to find out if it will ever update Magellan to include PKZip 2.x support since all the BBS's seem to have upgraded their file compression. Their answer wasn't very encouraging. Maybe if we started a Magellan fan club, Lotus would be more likely to sit up and take notice.

Ronald B. Hirsch, Boca Raton Florida

Editor's response: There is something of a Magellan fan club on CompuServe. Type GO LOTUSB. You'll find plenty of other users who would like to see the program updated, tricks about how to use it, and even some homemade file viewers.

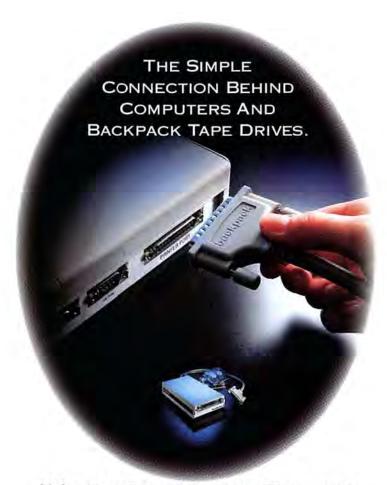
While Lotus is not likely to add *PKZip* 2.x support to *Magellan*, several other file management programs with similar capabilities, such as *Outside In*, *Norton Desktop for DOS*, *PG Tools*, and *XTree*, probably will include support for it in their next updates.

—Lincoln Spector

Fashionably Late?

aving just read the article "Deep in the Art of Taxes" [March], I think you could do your readers a service by reporting on how early someone can file a return using various tax preparation software.

I have just concluded a second frustrating year of trying to go modern with my tax filing. Last year I waited till well past my



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 IMbps 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

See us at COMDEX, Booth # 2348
Circle 200 on reader service card



praFAXModem V.32bis Internal \$349.95 Dos/Windows

The Best Choice: SupraFAXModem

Inside or Out, now you can choose the hot-selling SupraFAXModem technology that best fits your computer. Either way, Supra can turn your PC into a communications powerhouse!

SupraFAXModems come in a wide range of models, from our budget-minded SupraFAXModem 24/96i to the fastest fax modem available: the SupraFAXModem V32bis. Whichever model you choose, you will get Supra's proven technology and reputation for high-quality, reliable modems.

Supra modems are designed for novice and expert communicators alike. Whether you use

DOSTM, WindowsTM, or a Macintosh™, we've got a package for you - and our

Rockwell



upra Corporation

packages include everything you need. Plus our easy-to-follow Getting Started manuals will help you install your modern and start using it in just a few

minutes! Imagine sending and receiving perfect faxes,

exploring the world of on-line databases, or retrieving an important work file — all from the convenience of your desk. And advanced users will appreciate the errorcorrection and data-compression features that can save you

No matter what your needs, a Supra modern is your

best choice. Call us today at 1-800-727-8667, and find out why!





INT./EXT FAX upraFAXModem V.32bi SupraFAXModem V 32 SupraFAXModem Plus 2400 SupraFAXModem 24/96i DOS Package includes modem, Fax TalkTM Plus, COMitTM, cables, manuals • Windows Package includes modem, WinfaxTM, cables, manuals

marks belong to their respective companies. 7101 Supra Drive S.W., Albany, OR 97321 USA • 503-967-2410 • Fax: 503-967-2401

Circle 249 on reader service card

VEN as his model aircraft SCPEamed into the oak, our AST designer remained PREOCCUPIED with thoughts of PCs.

Even in their free time, our engineers are obsessed with PCs. A condition that can turn an afternoon with a model plane into an adventure. But it's a small price to pay when you

consider the results: the third-generation AST Bravo desktop PCs. With Bravo, our engineers addressed the issue of PC price/performance head-on.

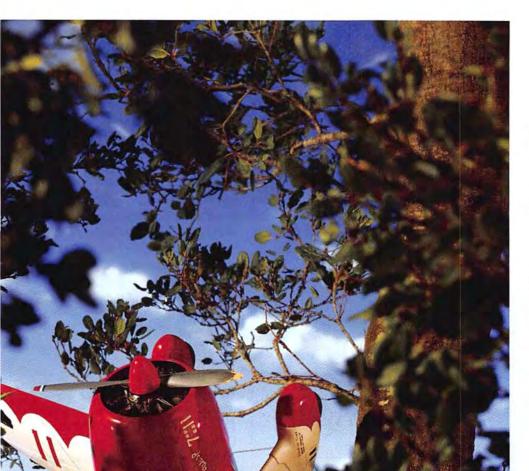
First, they enhanced Windows™ performance. Then, they improved reliability while reducing costs by creating an upgradable, four-layer

systemboard that's half its previous size. It's just one more example of how AST has been setting PC standards for over 13 years. In fact, our latest Bravo series has already won the praise of BYTE, PC World and InfoWorld. While our flying has won the praise of, well...

AST. COMPUTER

The Product Of Our Obsession.





POWER

Intel 486SX/25, 486SX/33, 486DX/33, 486DX2/50 or 486DX2/66 microprocessor. Optional 256KB second-level cache.

GRAPHICS

Video RAM upgradable to 1MB. Super VGA video controller supports 1024 x 768 color resolution.

FLEXIBLE

Four drive bays, four 16-bit ISA slots. Up to 64MB memory.

BUNDLED

120MB hard drive, 4MB RAM, 1MB Video RAM, high-res video monitor, mouse, pre-installed MS-DOS 5.0 and Windows 3.1.

RELIABLE

All models tested and compatible with the leading networking environments. All bundles are pre-configured and tested prior to shipping. Three-year warranty with standard one-year on-site service.

HONORS

BYTE "1992 Award of Merit" (Bravo family). PC World "Best Buy" (4/66D). InfoWorld "Buyers Assurance Seal" (4/66D).

RESPONSIVE

To learn more about our Bravo desktop PCs, just call 800-876-4AST.

AERODYNAMIC

A radio-controlled Gee Bee Super Sportster. With an 80cc gas-powered engine, it has a top speed of 160 mph. All optional, of course.





usual filing time so that I could use the final version of Parsons' Personal Tax Edge. The company promised that the final version would not be as late this year.

I can't vouch for the timeliness of Parsons' final version this year. After trying the early release and finding that it did not transfer Quicken data automatically, I decided to try TurboTax 93. While I found Turbo-Tax capable of direct automatic transfer of Quicken data, I again had to wait past my usual filing time for the final version to arrive. After waiting till February 14 for the state version, I finally gave up and did my returns by hand.

James D. Rapp, Eau Claire, Wisconsin

Deeply Disappointed

The anticipation with which I began reading "Deep in the Art of Taxes" soon turned to disappointment when I saw the statement, "Although you can't substitute your printouts for the official state forms, the software companies sell plastic overlays to produce a legal photocopied state return." This assertion is not true for the program I use-Andrew Tobias' TaxCut. This package does generate printouts that I can file. Nor, I am confident, is it true for the other best-seller, Turbo Tax. Simple errors of fact like this lessen my confidence not only in the review but also in your magazine.

Michael D. Gordon, via CompuServe

Editor's response: An editing error altered the quoted statement so that instead of referring to only one program, TaxPerfect, it implied that none of the programs have fileable printouts. All the programs but Tax-Perfect supply some state forms that you can file, although the particular states covered vary from package to package.

Pick a Boot

At the close of "Pick a Boot, Any Boot" [Home Office, March], Steve Bass mentions that DOS 6.0 is rumored to support multiple boots. One thing Bass doesn't mention is that DR DOS 6.0 supports multiple boots, and you can select what you want to load on the fly. Not only that, but DR DOS 6.0 is not merely rumored to provide hard disk compression, it does provide hard disk compression. Best of all, DR DOS is here now. While many people await the release of MS-DOS 6.0, some of us are apathetic about Microsoft's newest DOS. But we're eager to see what DR DOS 7.0 will provide.

John Elftmann, Omaha

Corrections and Clarifications

In the sidebar "Shareware on Line" in the April article "Great Software Under \$50," we published the wrong phone number for America Online. The correct number is 800/827-6364.

In "Dot Matrix Lives!" in March, the table on pages 178 and 179 should have said that Star Micronics printers can print labels.

Mail your reactions, responses, and ideas to Letters, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to the Letters forum on PC World Online; CompuServe, 74055,412; MCI Mail, PC World Editorial; or 415/442-1891 (fax). Include your name, city, state, and phone number. We reserve the right to edit letters.



Again. And Again. And Again.







LUMINATORT MEDIA PROT ANUARY, 1993 JANUARY, 1993

DEC. 1992

For convincing presentations, powerful instruction, and productive meetings, choose an award-winning LCD projection display from nVIEW. From gray scale computer projection to brilliantly colorful computer animation or full-motion video. From nearly any computer or video

source.

Performance. Innovation, Service, Cast your own vote. See how an nVIEW projection display can improve your work and your image.

Call 1-800-736-8439 or 804-873-1354.



Real Stats. Real Easy.

SPSS for Windows gives you answers your spreadsheet or database can't. It's a great value at \$695!

Learn Fast, Work Fast

"Stumbling blocks to statistical analysis are eliminated with SPSS for Windows. You don't have to be a programmer to use it and you don't have to be a statistician to understand it."

- Richard O'Reilly, Los Angeles Times. The 100% Windows interface makes doing

analysis simple. Context-sensitive help and an

on-line glossary of statistical terms are just a click away.

Complete Data Management and Editing

"A breakthrough in data capacity and ease of use...impressive." - Alan Fridlund, InfoWorld. There's no limit on the number of variables you can analyze. Read data directly from Excel,™ Lotus,® .dbf and SAS® transport files. Work live with Oracle® and SQL Server™ data. Edit and use data many ways, easily.



In-depth Statistics

"For more statistical analysis tools than you'll get from a spreadsheet such

as Excel, without the steep learning curve, SPSS for Windows is a great buy."- Michael Burgard, PC/Computing. Widely used statistics such as crosstabs, correlations and regression are in the Base module. Optional modules with unrivaled advanced statistics are available. You won't grow out of this package.

Automatic Statistical Graphics

"A complete set of graphics and charting capabilities." - Marc Ferranti, PC Week. Create business charts or statistical charts like histograms, boxplots and scatterplots automatically. Unlike other stats packages, edit the charts directly on-screen without respecifying.

When you really want answers you have to go beyond what spreadsheets or databases can offer. You need a package that is designed for real statistical analysis, reporting and charting - and is easy to use. You need SPSS® for Windows,™ the real stats, real easy combination that delivers real value.

You'll break out of the spreadsheet cell with SPSS for Windows. Do more than simple percentages and sums – subset, sample, aggregate, explore, summarize, poke and prod, slice and dice your data to get the answers you need. Analyze surveys, dig into databases, improve quality, conduct research studies, forecast sales and prepare reports with ease. All without writing complex macros or queries. Find relationships, see patterns and trends, determine significance and use the past to predict the future.

Learn fast, work fast. Prepare for your analysis quickly with SPSS' full-featured Data Editor. Choose from a broad range of statistical routines, including those in specialized add-on modules, that produce full-color charts automatically. Hot button between charts and related numerical output. Share information using DDE and OLE. Put together a great presentation with powerful and flexible business graphics and a report writer.

If you need help, the documentation is full of statistical "how to," and experienced technical support is just a phone call away.

SPSS for Windows - when you need more stats than a spreadsheet or database can offer.

Order now and get a great value — only \$695. American Express, Discover, MasterCard or Visa accepted. Unconditional 60-day money-back guarantee.

Fax (312)329-3668 or Call (800) 543-5837



Chicago · Washington, DC · Chertsey, UK · Gorinchem, The Netherlands · Munich · New Delhi · Singapore · Stockholm · Sydney · Tokyo · And Distributors Worldwide

6 steps to healthy computing



Curtis offers many practical and low cost accessories that can reduce everyday physical stress and strain from computing.

Long periods of highly routine computing can harm your physical and mental well-being. That's why Curtis offers an entire family of ergonomic accessories to improve your computing health and comfort.

Choose from eye-saving Copy Clips and Glare Filters, wrist-saving Keyboard Organizers with Wrist Rests, and posture enhancing Monitor Arms. In no time, you'll be able to feel the difference these innovative Curtis accessories make in your personal computing comfort and well-being.

So why wait any longer? Six simple steps you can take today can mean more energy, greater productivity, and more job enjoyment tomorrow.



Manufacturing Company, Inc.
CURTIS

30 Fitzgerald Drive, Jaffrey, NH 03452

©copyright 1993, Curtis Mfg. Co., Inc.
All Rights Reserved

For more information, call Curtis at 1-800-955-5544, Ext. 240. Ask for your free "Healthier Computing Guide" brochure.

FTC Crackdowns, Support Woes: Where Buyers Can Turn for Help

he Federal Trade Commission (FTC) has charged Business Computer Systems, a computer mail-order firm in Virginia Beach, Virginia, with failing to ship products on time (or at all) and with failing to issue refunds or credits as promised.

In papers filed in U.S. District Court in early March, the FTC asked, among other things, that the owners of Business Computer Systems (also known as BCS Group or Megasource) repay consumers the funds owed them for goods they never received.

Specifically, BCS founders Tal Shamgar (who allegedly also went by the names of Bob McGuire and Bob Jones) and David Masuck were charged with violating the Mail Order Rule by failing to ship products within stated time frames and by not giving customers the option to cancel their orders. The company was also charged with violating the rule by not making prompt refunds. (The rule requires that refunds on canceled orders must be shipped within seven days for eash or check sales and within one billing cycle for credit card sales.) The complaint also alleges that the owners misled customers by giving false information about when replacements for damaged or broken items would be sent.

Without admitting any guilt, BCS owners have agreed to comply with federal laws governing mail-order purchases and have established an escrow account from which they'll fund consumer redress. Carlton Bennett, attorney for the owners, said the company had already begun to take care of consumer complaints. "Ninety-nine percent of the complaints were misunderstandings," said Bennett, noting that refunds were already being processed prior to the FTC action.

As part of the agreement with the FTC, over the next six months BCS

By Roberta Furger

will provide the FTC with a monthly accounting of all refund requests, as well as information about when the refunds are issued.

Consumers who have outstanding complaints against BCS should write to Thomas Cohn, Division of Marketing Practices, Federal Trade Commission, Sixth St. and Pennsylvania Ave. NW, Rm. 238, Washington, DC 20580.

Cohn would not comment on whether the FTC's action against BCS was part of a larger effort to crack down on

violators of the Mail Order Rule. He noted that the FTC receives numerous complaints on such alleged violations but does not have the resources to act on all of them. Cohn explained, "We look for a pattern of unlawful practices that affect a wide variety of customers in a wide variety of geographic areas."

Shop Talk

Dataworld Goes AWOL, Former Employees Start Repair Service

Can you tell me anything regarding the status of Dataworld in Pico Rivera, California? I recently purchased a computer from Dataworld and need to get in touch to ask a question.

Elbert Maloney, via CompuServe

Editor's note: We've received several letters asking about Dataworld, so we tried to contact the company. Its phones are disconnected, and its Pico Rivera offices are empty (but it does continue to pay the lease on the property and has made payments on other debts).

Although we were unable to reach the owners of the company, John and Paul Hsiao, we did speak with Bob



Chang, the former sales manager of Dataworld. According to Chang, all of Dataworld's employees were laid off in October 1992, and the owners

PC World Consumer Watch Editor Roberta Furger

"burned all their bridges with employees, vendors, and customers."

Chang, with many of Dataworld's technical staff, has formed a service firm to repair laptops (which, he says, made up 90 percent of all Dataworld sales). The new firm, called Notebook Service Center (NSC), is located in Orange, California, and can be reached at 714/939-9140. NSC will repair Tandon laptops as well as Dataworld products.

Although the new company will not honor existing Dataworld warranties, customers whose products are still under warranty will receive a discount for any repair services.

Same Name, New Company

am writing about a company called Bulldog Computer Products. It is located in Georgia and has been advertising for some time in various computer magazines.



BUG WATCH

ATI Mach32 Video Driver

A new version (Build 59) of this set of drivers for the ATI Graphics Ultra Pro graphics board is now available and fixes several bugs in the original drivers, including incompatibilities with the HP DeskJet printer and WinFax Pro. A "zipped" driver set, PR059.ZIP, is available on both CompuServe (go ATITECH) and ATI's BBS for download. Users can also obtain a copy by calling ATI. One note to owners of Gateway 2000 DX2-66 systems: Gateway 2000 had not completed its own testing of Build 59 as of this writing and planned to continue offering an earlier version of the driver (Build 54) on its CompuServe forum (go GATEWAY) until testing was completed.

ATI Technologies 416/756-0718, 416/756-4591 (BBS)

Faxability Plus

Installation of Intel's Faxability Plus for Windows can stall or fail if the install routine is launched from within Norton Desktop for Windows or if any antivirus or erase-protect tools are memory resident during the install routine. Intel recommends users who encounter problems install the program from within Windows' Program Manager. If you're still

unable to complete installation, disable any TSRs while you install the program. Intel PC Enhancements Technical Support 503/629-7000

Kodak Photo CD

Kodak has confirmed that *Photo CD Access* for *Windows*, the software required to view and manipulate photos, and *Photo CD Access Developer Kit for Windows* will not reconstruct some "Poster" resolution images (2048 by 3072 pixels). High-contrast images are most likely to be affected by this problem, which causes streaks to appear across the image at that resolution.

Kodak has posted a fix for the problem on the CompuServe Multimedia forum; a disk version of the fix is also available from Kodak free of charge.

Kodak Information Center 800/242-2424 ext. 53

-Richard Melville

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

Richard Melville is an editorial intern for PC World.

My wife ordered a printer from this company just before Christmas, using a credit card. She didn't receive it, and after making several calls to the company, she was told Bulldog Computer had gone bankrupt and that new owners had purchased the rights to the name but not the assets (or liabilities) of the old company.

It seems questionable for a new entity to operate the company with the same name. I believe this to be misleading to the public and unethical business practice. How does the "new" Bulldog Computer Products compare with the "old" Bulldog?

Garey L. Cooper,

Huntington Beach, California

Editor's note: The name of a company is an asset that can be bought and sold, much like equipment or inventory. That's what appears to have happened in the case of Bulldog Computer Products, but the purchase has caused a fair amount of confusion.

According to sources, the old Bulldog went into foreclosure in December 1992. In January of this year, the trade name and remaining assets were purchased from the bank by new owners, who are now doing business under the Bulldog company name and using the same phone number as the old company, says Jim Drawdy, president of the new Bulldog Computer Products.

According to Drawdy, he and his partner did not buy the corporation and therefore are not obligated to fulfill outstanding orders or repay creditors. "The bank foreclosed and sold off the assets of the old company," says Drawdy, noting that any accounts receivable went to the bank to pay off existing debt. "We're trying to assist anyone who calls [with support needs]," he says, "but there's nothing we can do about old accounts."

Attorneys at the Augusta, Georgia, law firm of Fulcher, Hagler, Reed, Hanks, and Harper, which represents the owners of the old Bulldog Computer Products, would not comment on the status of the company or on what, if any, recourse is available to customers who never received products they paid for. James McNair, a paralegal with the firm, would note only that a press release may be issued in the future to discuss what happened to the old Bulldog Computer Products.

No Response From Dallas Fax

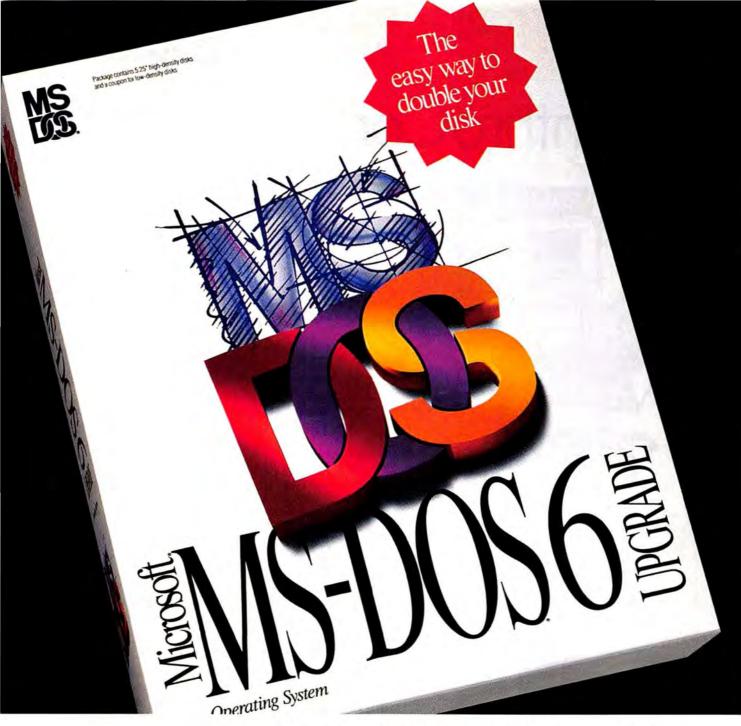
am having serious trouble with a vendor called Dallas Fax, from whom I bought a 9600-bps modem with a lifetime warranty in March of last year. Some time ago I sent the modem in for repair, and I have been unable to get either a refund or a repaired modem. The modem never worked correctly, and now the company can't be found. Greg Fields, Burke, Virginia

Editor's note: According to the Better Business Bureau for the metropolitan Dallas area, Dallas Fax vacated its offices and quit answering its phones in early February. The company had an "unsatisfactory record with the BBB," according to Director of Consumer Services Dianna Prickett; it received a large number of complaints and failed to respond to inquiries. Consumers complained that Dallas Fax failed to deliver products or process refunds. Because of these problems, Dallas Fax had its BBB membership revoked.

According to one former Dallas Fax customer, shortly before the company's phone lines were disconnected, employees began answering the phones as "Atel Computers." We were unable to obtain any additional information on Atel, however.

AddStor Tech Support: Help Needed

wo months ago I installed SuperStor, a data compression package from AddStor, to free up some space on my



YOUR HARD DISK JUST GOT DOUBLE THE ELBOW ROOM.

All those files and applications you've accumulated won't cramp your style anymore. Now our integrated disk compression doubles your disk space. Easily. Invisibly. Safely.

dblspace

Simply type it in and your disk has double the space.

And our improved memory

management lets you extend your memory with just a few keystrokes. We've even added great new features like backup, anti-virus and undelete tools for users of both MS-DOS* and Microsoft* Windows."

So if you need more space, integrated disk compression in the MS-DOS 6 Upgrade operating system makes it easy to stretch out.

> Microsoft Making it easier

CONSUMER WATCH

AnthroCart



Call for a free catalog: 800-325-3841

6:30 AM - 5:00 PM, PST, M-F

LOTS OF SIZES

HOLDS 150 LBS.

ADJUSTABLE

ACCESSORIES

OVER 40

TO ADD

AVAILABLE

Anthro Corp. • 3221 NW Yeon St., Portland, OR 97210 • (503) 241-7113 • FAX: (503) 241-1619

AnthroCart MOBILE ADJUSTABLE INCREDIBLY STRONG LIFETIME WARRANTY Call for a free catalog: 800-325-3841 6:30 AM-5:00 PM, PST

Anthro Co. • 3221 NW Yeon St., Portland, OR 97210 • (503) 241-7113 • FAX: (503) 241-1619

300MB hard disk. As an Xbase developer, I store large amounts of sample data and program code from various clients and was running out of room. The product performed wonderfully until recently, when it gave me an error message and then refused to recognize the drive, Suddenly, two days' worth of programming efforts were inaccessible.

I called AddStor's technical support as soon as the business opened the next day and got a recording saying to leave a message. Surprisingly, there was no option to be put on hold and wait for assistance. I left a detailed message but was not called back that day. The next day someone did call back three times while I was out, but each time I called back I got the same recording.

I have never had so much trouble getting support for any software package.

James Slater, Denver

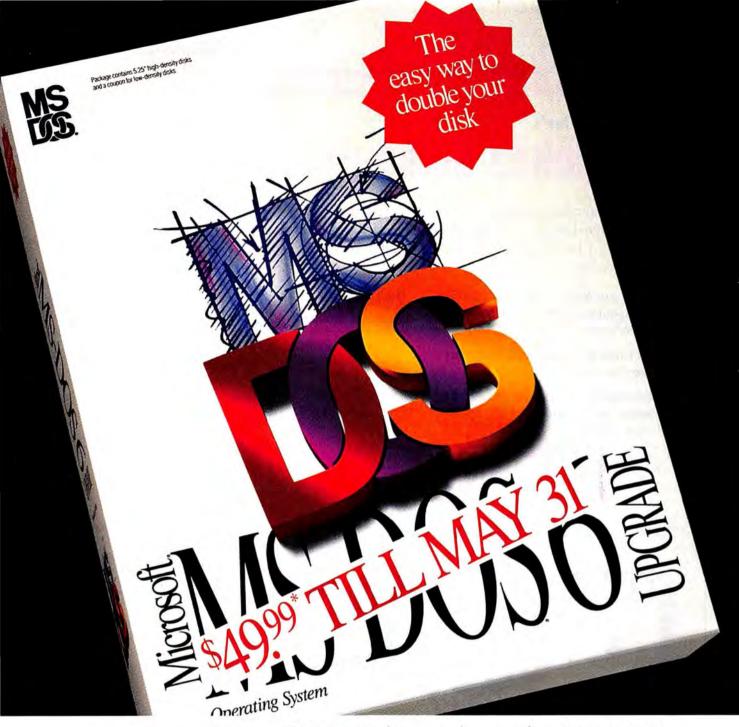
Editor's note: According to AddStor marketing manager Michael McMahon, the company's support volume had increased beyond the capabilities of its staff. To address these problems, the company implemented a new phone system at the end of January that includes a waiting queue. Customers calling AddStor technical support can now elect to be placed on hold until a technician becomes available.

Help for Frecom Customers

We at PC World have received several calls and letters from stranded customers of Frecom Communications, a Fremont, California, manufacturer of fax boards, modems, and fax software. The company went out of business at the end of last year, Frecom customers may be able to get support, however, through CXR Telcom Corporation, a San Jose, California, firm that had been manufacturing fax boards for Frecom prior to Frecom's demise.

According to CXR product manager Jim Schwalb, CXR began handling customer service calls for Frecom in September 1992 and is continuing to support Frecom products. Customers who bought Frecom products can obtain current software revisions free of charge from CXR. The company will also upgrade the fax boards or modems to current revisions at no charge if the technical support staff deems it necessary in order to fix a problem.

Schwalb says CXR is also working to fix



FOR A LIMITED TIME YOU'LL HAND OVER A LOT LESS.

This is your one chance to grab the MS-DOS' 6 Upgrade operating system at a price that's simply untouchable. Till May 31 you can get disk compression and improved memory management all for \$49.99.

Now integrated disk compression easily doubles the space on your hard disk." And our improved memory management gives you

more free memory. In a snap.

To get information about this fantastic deal, call (800) 228-7007, Dept. RX3. Better yet, pick up the MS-DOS 6 Upgrade at your nearest reseller. Before this opportunity slips through your fingers.



COMING IN JULY!

PC World Special Report

Business Traveler's Guide to Mobile Computing

Our editors have been on the road again, preparing a special 20-page 'hands-on' report on the realities of Mobile Computing for business travelers. In it, you'll find these valuable articles:

- PC World and American Airlines examine the 'air-go-nomics' of using notebook computers aloft.
- Buyer's Guide to 22 notebook computers you can take with you.
- A survival guide with tips for successful computing 'on the road' in hotels, airports and other offices.

Don't miss this important section!

PC World - July issue

PC WORLD



\$50,000 World Class Contest

You have a one-in-a-zillion chance of winning the lottery, but you can't lose with this FREE opportunity to win your share of \$50,000 worth of top-rated hardware and software products.

Fill out the PC World 1993 World Class Award ballot, and mail it in today! Turn to page 95 for details.

Guaranteed prizes for hundreds of early-bird entries!

CONSUMER WATCH

bugs in the Frecom fax software. CXR technical support can be reached Monday through Friday, 8 a.m. to 5 p.m. (PST), at 408/955-0561.

Unfortunately, Frecom customers who are owed money for orders placed prior to September of last year are out of luck, since CXR has no records to support those claims and does not have access to those funds.

NEC Kudos

purchased a new NEC CD ROM drive by mail order in October 1991. Although I had niggling problems from the start, I never notified the vendor and didn't get around to contacting NEC until after the warranty had run out. In fact, I didn't even bother to send in the warranty cards.

When I finally called NEC, I was only hoping to get the address of a service center to which I could send the drive for repair at my own expense. To my surprise, however, the NEC technical support manager told me to return the drive to NEC for repair. The drive came back to me a few weeks later, without an invoice for repair costs, and it now works perfectly.

You can be sure there is more NEC hardware in my future.

Boyd C. Swingley, The Azores, Portugal

Think you've gotten a raw deal—or a great one? Mail the details to Consumer Watch, PC World, 501 Second St., #600 San Francisco, CA 94107; or send them electronically to the Consumer Watch forum on PC World Online; MCI Mail, PC World Editorial; CompuServe, 74055,412; or 415/442-1891 (fax). We'll investigate complaints and publish letters with broadest interest.



POWER TIP no. 283

Multiple WordPerfect Copying

Here's a shortcut for copying the same block of text to several locations. Use <Ctrl>-<F4> to copy the block the first time; then move the cursor to the next place you want to copy the text to and press <Shift>-<F10><Enter>, which inserts the last piece of text that you moved or copied.

Carol N. Landsman San Diego

Down the Hall and 1200 Miles Away

hen your company sets up shop in another state, communication with the home office can become a thorny problem. Phones and fax machines can only do so much when you and a distant colleague need to review a spreadsheet at the same time. And those overnight mail bills can add up, too. This month J. Clark Ribordy, a CPA and controller at the Colorado Springs office of Sage Health Services of Evansville, Indiana, explains how he helped set up a wide area network that lets him work with his colleagues in the home office as if they were just down the hall. -Ed.

Making the Connection

As an accountant, I use my PC for practically everything I do, whether it's setting up a complicated *Excel* spreadsheet or looking at my schedule in *Futurus Team*. As much as I value my computer, however, I never thought about how much time computers save until my company opened another office 1200 miles away.

We're in the business of long-term health care. There are 24 employees in the home office, and 16 in Colorado Springs, Colorado. Routinely, life-and-death crises arise involving patients, their families, and the health care sites we manage. In these situations—not to mention in our day-to-day business operations—it's critical that the home and regional offices communicate immediately. But the distance between offices was making quick communication problematic.

For example, when I wanted my boss to view one of my worksheets, I had to print it, reduce it to fax size on a copier, and then ask our administrative assistant to fax the copy to the home office. Since the fax line was usually busy, this process could take a few anxious hours. Then the assistant on the other end would have to copy the murky fax back

onto paper. By the time my boss tried to decipher them, my miraculous mathematics were about as legible as your average hieroglyphics. He'd call me to tell me he couldn't read the worksheet, and I'd end up paying Ma Bell for the privilege of reading the numbers to him or spending \$12 to send a copy by overnight mail.

As a result of such misadventures, we were spending almost \$900 a month just on phone bills and mail costs between offices, while we threw an unimagin-

able amount of money down the drain in unproductive labor.

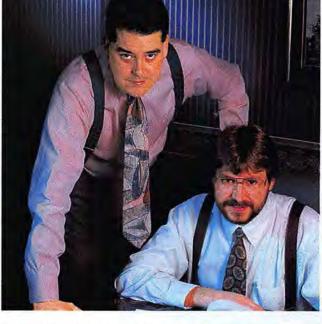
As the computer "expert" in our office, I volunteered to look into solutions, and found myself working hand in hand with Steve Knust, the computer networking expert in the home office. Our goal was to find a better way to share accounting and general office information between the two offices.

One option we considered was to set up a video teleconferencing system in each office that would let us hold meetings in real time. A little investigation revealed that the \$70,000 price would give us some fancy video cameras and monitors, but it still wouldn't let us share computerized information.

Making a Net Work

Steve hit on a better solution: Set up a local area network in each office and link them through a dedicated data line. It would, in the end, allow our offices to communicate as if we were just down the hall from each other. This sounded simple and elegant, but it took some doing to get all the pieces in place.

Steve devised a system that took



advantage of our existing computers and software, but added several new capabilities.

We first purchased two ALR 386 PCs—one for each office—to act as our network file servers. We J. Clark Ribordy (left) and Steve Knust of Sage Health Services.

installed Novell NetWare on each and linked the servers to several of our existing Dell 386 and 286 PCs. We also purchased two additional 386 PCs to act as gateways to our AS400 minicomputer, which we had long used to handle our accounting data. The gateways allow the mini to download to the PCs, and the PCs to upload to the mini. In addition, we picked up a router to determine what route the information would take between the two networks.

We also purchased ethernet cards for all the workstations, a high-speed laser printer, two 650MB SCSI hard disks, Teflon coaxial cabling, a remote controller for the AS400, a synchronous adapter and several Xircom pocket ethernet adapters, and a WAN electronic-mail module for *Futurus Team*.

Key to the new system was a dedicat-

REAL PROBLEMS REAL SOLUTIONS



ed digital telephone link we leased from SP Telecommunications in Livonia, Michigan. Like Sprint, MCI, AT&T, and other large telecommunications firms, SPT offered to lay the data link and install everything, including the telephone jacks. The cost of the data link, including installation, was a flat rate of \$650 per month. But there was a eatch: We had to have the link multiplexed-split into two bandwidths-in order to accommodate connections between both the network and the minicomputer. So we also had to purchase a multiplexing data service-channel service unit, a modem that "interprets" among the router, the AS400 phone link, and the data link.

Finally, we invested in security. To avoid losing data during a power failure, we purchased a tape backup unit, a backup power supply, and dual hard drives that duplicate each other in case one should crash.

Wave the Magic WAN

The grand total for our purchases—hardware, software, cards, adapters, and cabling—came to approximately \$56,000. It might sound like a big outlay, but the consensus is, it's been worth it.

Our new system allows everyone in the regional office to access any file on the server in the home office, and vice versa: It takes about 15 seconds for me to call up a spreadsheet that's sitting in a PC 1200 miles away. I can make changes to it, save it, and have it printed out in Evansville. I can use *Futurus Team* to keep in touch with my colleagues and do my scheduling. Better still, I can use the Chat function in *Futurus Team* to type a conversation in real time with someone in the other office—and say good-bye forever to steep phone bills.

With the dedicated data link, there's no per-access charge, no telephone charge, and no modem; and the fee remains the same no matter how many times we use the system. We estimate we're saving about \$250 a month in telephone and mail costs.

But the major return on investment comes in lower labor costs. Before we installed the network, it took two assistants nearly full time just to handle all our interoffice communication, to the tune of at least \$40,000 per year. Today, the assistants are doing more productive work in accounting and data entry, and we've cut our receptionist's hours by half. And since my boss

and I no longer play "spreadsheet tag," decisions that used to take hours now take a fraction of that time. We've calculated that the four salaried managers who use our networks save anywhere from 10 to 20 percent of their time, worth at least \$33,000 in increased productivity. Add up the saved costs of two assistants, the \$3000 per year in phone and mail costs, and a minimum of \$33,000 in increased management productivity, and we've recouped our entire \$56,000 investment in the first year alone.

A One-Month Project

Our project proceeded surprisingly quickly: We were able to do all our research, purchase all the components, and set up the entire system in less than a month. Steve had to invest a couple of weeks up front to do the research and set up the hardware and software, but today, managing the network doesn't take him more than a couple of days each month. Considering the time and expense we're saving, setting up our network is one of the smartest business decisions we've made.

If you use PCs to manage people and other resources in a business environment, we want to hear from you. Send your article idea—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, PC World, 501 Second St. #600, San Francisco, CA 94107; or send it electronically to the Real Problems, Real Solutions forum on PC World Online; 415/442-1891 (fax); or call us at 415/978-3224. We pay \$300 per published column. Sorry, we cannot acknowledge unpublished materials.

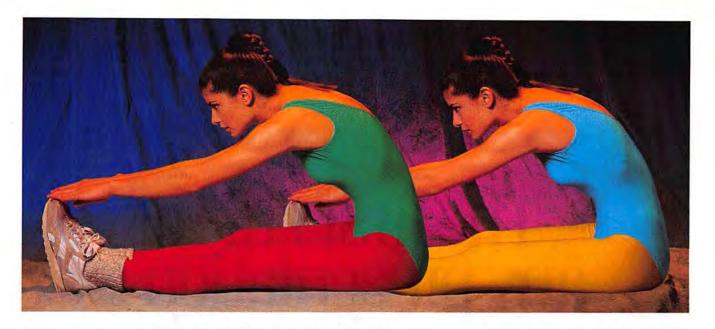
0

POWER TIP no. 284

Delete Without Asking

You don't always want to be prompted (Y/N) when you use the DEL *.* command—especially if you use it in a batch file. Try ECHO Y | DEL *.* instead; this will delete all the files in your current directory without asking for permission first.

Jason K. Douglas York, Pennsylvania



Exercise Your Video ... Stretch It!

Why settle for an out-of-shape graphics board? Let ATI's new GRAPHICS ULTRA+ and GRAPHICS ULTRA PRO cards pump up your computer with graphics and multimedia video acceleration.



Only the GRAPHICS ULTRA+/PRO cards come ready to accelerate¹ multimedia applications under Windows. Stretch small video images to partial or full screen for better visibility ... and maintain smooth dynamic motion (when others fall behind).

ATI's mach32 Accelerator Chip adds the muscle to run Windows, NT, OS/2 and CAD fast... even faster than other local bus solutions. With 2.0MB of video memory, ATI accelerates 1024x768 in 65,000 colors. Run resolutions up to 1280x1024, colors up to 24-bit, and sit-up to flicker-free graphics at 76Hz refresh rate. Plus, the best software support of ANY accelerator product with ATI,

8514/A drivers. ATI TECHNOLOGIES INC.

Exercise your options under Windows with the FlexDesk Control Panel or use DeskScan to pan and zoom across a virtual desktop. And our exclusive CRYSTAL FONTS smooths TrueType for laser-quality text right on-screen.



GRAPHICS ULTRA+

- ► Accelerated 1024x768 at 65,000 colors
- ► True color (16.7M) at 800x600
- Multimedia Video Acceleration
- ► Fast zero wait-state VGA
- ► Includes three button inport mouse²



- ► 5 year warranty
- ▶ Priced from \$399.00³

GRAPHICS ULTRA PRO adds

- ► Even faster performance with VRAMs
- Accelerated
 1280x1024 at 256
 colors up to 74Hz
 non-interlaced
- ► Available in ISA, EISA and Micro Channel versions
- ► Priced from \$599.003

Avoid low impact graphics.
Shape up with ATI Graphics and
Multimedia Video Accelerators.

ACCELERATORS · GRAPHICS · MULTIMEDIA · COMMUNICATIONS













ATI TECHNOLOGIES INC. 3761 Victoria Park Avenue Scarborough, Ontario Canada M1W 3S2 Tel: (416) 756-0718 Fax: (416) 756-0720

Copyright © ATI Technologies Inc., 1993. All company and/or product names are trademarks and/or registered trademarks of their respective manufacturers. 'Accelerates Indeo Video, RLE and Video 1 compressed files under Video for Windows, QuickTime for Windows support is planned. Performance varies depending on system configuration. 'ISA versions only.' Suggested retail prices, dealers may sell for less. Prices and features are subject to change without notice.

The first rule of any presentation is keep it simple.

And it doesn't get any simpler than this.

Introducing Freelance Graphics for Windows, Release 2.0.

The first release of Freelance Graphics® won every major award in the presentation graphics category.

Now Lotus® enhances Release 2.0 with new features and improved usability that actually make the simple three-step process even simpler. In fact, it's now so fast, so friendly and so automatic, it's actually changing the way people use presentation graphics software.

Now people not only use Freelance Graphics to easily create beautiful last minute presentations, they use it to quickly generate handouts, even for informal meetings.

Let our SmartMasters be your guide.

Only Freelance Graphics has SmartMasters™ to automatically guide you through every step of the design process. You simply select the look you want, choose a page layout, and start filling in the blanks. It's that easy.

Just one click brings you a complete array of drawing, charting and editing tools, plus onscreen galleries for chart types, symbols, tables, and org. charts. You'll easily create professional quality output in overhead, slide, handout, and screen show formats. And a new toggle switch allows you to instantly view your presentation "Creating a presentation of even (100 stides) is absurdly easy—and much easier, in many ways, than with competing products..."

PC Week 2/15/93

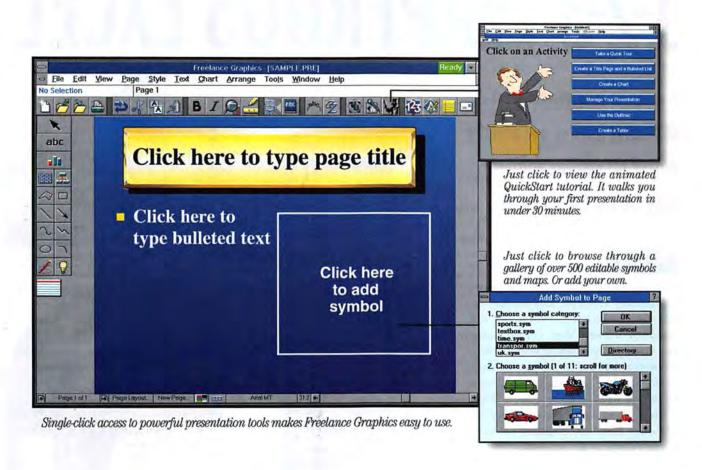
"Inviting and even fun to use. More important, I produced a presentation in about an hour."

BYTE 2/93

"There's bad news for the competition... Freelance Graphics for Windows 2.0 is even better than its predecessor. This program is about as straightforward and easy to use as they come.

PC World 1/93





in black and white or color. Freelance automatically optimizes the design for printing either.

You'll be amazed at the beautiful results you immediately generate, without really trying. In fact, you couldn't look bad even if you tried.

Is the world's easiest presentation graphics software easy enough for you?

Call 1-800-872-3387, ext. 8648,* to order

your free, full-featured working model. You'll see just how simple it can be. While you've got us, ask about our special competitive upgrade price.

And for those just getting into Windows, keep in mind that Freelance Graphics is also included in Lotus SmartSuite: four award-winning Lotus Windows applications at a very attractive price.



Presentation Graphics for Windows

GettingStarted.

Top of the News

1-2-3 LEAPFROGS EXCEL

A dynamite interface, an arsenal of charting features, and powerful version and database managers make the new 1-2-3 a winner.

IESI DRIVE

1-2-3 4.0 for Windows is a solid winner. The program remedies most of the glaring shortcomings of 1.1, the previous Windows release; it appropriates some of Excel's and Quattro Pro's best ideas; and it pushes the functionality envelope with a brainy, innovative database system plus a unique work-group Version Manager that offers a whole new way to use spreadsheets. While a few of 4.0's features don't yet have the versatility found in competing products, Lotus is finally on the right track.

Catching Up

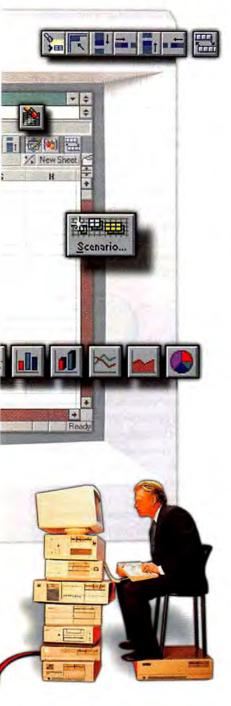
With release 4.0, the future of information systems becomes clear: a world of modular systems made of networked servers and PCs running client/server databases, workgroup software, and familiar business applications that enable workers to collaborate and communicate instantaneously. In this world, the spreadsheet will be your data center-an arena for assembling, analyzing, and presenting information from a variety of local and remote sources. Already, spreadsheet vendors are shaping products to this vision, concentrating on database access, presentation-quality graphics, and analytical tools. Release 4.0 brings this vision a step closer to reality.

The Look! The Feel! The Je ne Sais Quoi!

You'll see the difference in the interface with its streamlined, logical menu structure



AND QUATTRO



and well-organized dialog boxes. If you're upgrading from release 1.1, you'll spend a lot less time poring over the menus, wondering where the programmers have stashed some feature you need. And while the "classic" *1-2-3* slash-key menus are still there, you probably won't need them.

New tool bars offer myriad menu shortcuts, with well-designed intuitive icons. The status bar at the bottom of the worksheet is a mini-menu that lets you change the numeric format, the font, and other features of the current selection.

Menus and tool bars change as you select a cell, a graph, a database query, and so on. Ideally, this feature would provide an easy-to-grasp view of your options, but it needs some work. We found the context-sensitive tool bars less helpful when our task spanned several contexts; the tool we needed always seemed to be on the other tool bar. In contrast, *Excel*'s multiple–tool-bar approach is less aggressive but more flexible.

Performing Mouse Tricks

Release 4.0 has learned all the current mouse tricks. There's drag-and-drop for moving and copying (although you can't use it to insert a selection, as you can with *Excel*, and there's no warning if you overwrite destination cells). You can select entire columns and rows, and you can select (though you can't name) discontiguous ranges—a real boon for speeding up spreadsheet tasks.

Besides improving the basics, Lotus has thoughtfully standardized the left and right mouse button conventions. Click the right button, and you'll see a menu from which you can change the properties of a cell or other object; double-click, and you go to the dialog box where the object was created. For instance, right-click on a graph title, and you can change its font, box pattern, and so on; double-click to change its wording and placement. Another nice touch: The mouse



News Monitor

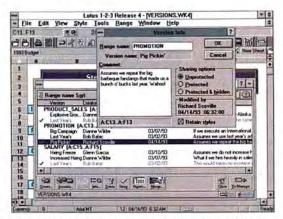
PLUG-AND-PLAY PC? Microsoft and Compaq will codevelop a new generation of easier-to-configure desktops; advanced portables; and hand-helds with pen interfaces and wireless communications. The companies will focus on developing Windows-based systems that are simpler to set up and use and that will include as standard such features as CD-quality audio, CD ROM drives, and built-in networking.

The agreement follows the March announcement of the Plug and Play ISA specification, a move by Microsoft, Compaq, Intel, and others to create a design for future PCs—systems that will configure software and hardware components automatically, with little user involvement (yes, like the Macintosh). No product details have been announced, and industry watchers don't expect to see Plug and Play products before the end of the year.

ACROBATIC FORMATTING: Adobe will introduce a software family able to convert virtually any document into a generic format that can be read by other computers, regardless of hardware platform, operating system, or even the application used to create the original document. The Acrobat family will include a Portable Document Format (PDF) Writer, which will translate even heavily formatted documents, such as graphics, desktop publishing, or spreadsheet files, into the PostScript-like PDF. Users with other Acrobat products can then view, store,

(continued on page 45)

Top of the News



VERSION MANAGER provides sophisticated what-if tools.

pointer changes appearance to let you know whether a click will select a cell, a graph, an object, a graph axis, a line, a query object (more about query objects later), and so on.

3-D Without Funny Glasses

One of the great spreadsheet innovations is 3-D worksheets. Introduced in 1-2-3 release 3.0 (for DOS), they provide flexibility for model building and organizing work that a 2-D worksheet such as *Excel* can only ap-

proximate. Borland greatly improved this feature in *Quattro Pro for Windows* with a simple notebook metaphor. *1-2-3* mimics this paradigm: Its pages are nameable, with easy-to-select tabs for each worksheet. You can use sheet names to reference ranges in formulas, which makes them easier to read, and you can right-click on the corner of the sheet to change its global formatting properties. But in marked contrast to *QPW*, release 4.0 cannot link the sheets

into named groups for formatting. Group formatting is still an all-or-nothing venture, as it was in the 3.x releases.

Did we hear you ask about macros? Yes, 1-2-3 4.0 for Windows has them, and fortunately, they are no longer keystroke oriented. Instead, there are over 250 new macro commands, such as {SELECT} to select ranges, {MENU-CREATE} to modify the menu bar, and {SET} to control the interface. As in release 3.0, you record your

actions in a special Transcript window, test and edit the macro there, then paste the macro commands back into the worksheet and name them to create the macro. However, the new release can also run all your old DOS 1-2-3 macros.

Decorative Touches

The new 1-2-3 has overtaken the competition at spreadsheet formatting. Anytime you want to decorate, you can select from one well-organized palette of 256 colors and another with 64 fill patterns. You can align all kinds of cell entries, not just labels; wrap text within a cell; and—a first for spreadsheet programs—rotate the entries within cells. Formatting styles are now easy to define and use. On the other hand, you still cannot create your own numeric formats, though 1-2-3 partially compensates for this shortcoming with additional @functions.

And speaking of @functions, you'll note 110 new ones. Many mimic those found in Excel 4.0, including math, engineering, financial, and statis-

tical functions.

New Options for Low-Cost "Laser" Printing:

Good news for printer buyers—three technological developments will create lower-cost printers in 1994, according to industry analysts. The latest advance involves SoftBand, an image rendering technology developed by Phoenix Technologies. This banding technique reduces memory requirements of 600-dpi PostScript Level 2 printers from 6MB of DRAM to 2MB. (The technology is incorporated in Phoenix's PostScript Level 2 interpreter, PhoenixPage.) You may see low-end printers using PhoenixPage for close to \$1000, says Paula Bursey, industry analyst at DataQuest. Currently, PostScript printers range from \$1900 to \$6000. Phoenix says 600-dpi PostScript printers with PhoenixPage will be available from a number of vendors by November of this year.

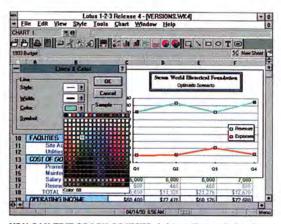
Another development likely to lower prices involves the printer's



light source. New LED printers employ printheads with fewer moving parts than traditional laser printers. These units are less expensive and could

prove more reliable. Some LED printers are already on the market, such as Okidata's 300-dpl OL 400, which carries a street price of around \$590. Other vendors offering LED products include Samsung and Kyocera. And more such units are on the way, according to Marco Boer, senior printer analyst at International Data Corporation (IDC). "Next year, you'll see more vendors come out with LED printers—many in the \$500 range." Boer says.

For Windows users, GDI (Graphics Device Interface) printers will offer a third way to save money on high-quality printing. GDI printers don't require a controller, the printer mechanism that translates file information between the PC and the printer. Instead, these printers are built to understand the Windows GDI command set and let your PC do the thinking. They also provide faster Windows printing. The only drawbacks: GDI printers work only with Windows, and they aren't suitable for networks with non-Windows computers because GDI printers can't interpret PCL or PostScript print jobs. Vendors are working steadily to improve GDI printers, and many more models will be available during 1994, according to IDC's Boer. He expects GDI printer unit sales will rise from this year's 80,000 to 250,000 in 1994 and jump to 560,000 in 1995.



YOU CAN EDIT GRAPH OBJECTS right on the worksheet.

Like Excel, 1-2-3 4.0 for Windows sports a graphic annotation layer. You can rotate and flip objects and text-capabilities you don't get with competing products. A set of "designer frames" lets you add drop shadows, picture frames, and other borders to graphs. But you can't use drag-and-drop to copy graphic objects as you can in Excel. Nor can you snap objects to the worksheet grid, a trick that lets Excel users create precision drawings.

As for graphs, release 4.0 has not only corrected the problems of the previous version, its graphics are now simpler and more flexible than Excel's or QPW's. You no longer need go to a special window to edit a graph-you can do all your work right in the graph itself. If you want to print just the graph, select it and go to the print menu. If you want to arrange all your graph objects on a single worksheet page as you can in QPW, just move them there.

There's a slew of new chart types, including radar charts and error bars. Graphs can include up to 23 series, and you can assign any series to the left or right y-axis. Editing graphs is much easier than in Excel, especially adjusting the series, setting up multiple y-axes, and positioning titles.

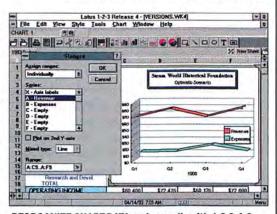
So when it comes to basic spreadsheet functionality, 1-2-3 4.0 for Windows is on a par with its Windows peers. For work-group computing, however, 1-2-3 offers a couple of striking innovations, including a totally

revamped database manager and, for playing what-if with your colleagues, the new Version Manager.

This popular spreadsheet activity was made easier by Excel 4.0's Scenario Manager, which lets you create multiple what-if scenarios and store them with a worksheet. 1-2-3 4.0 for Windows' Version Manager greatly extends this capability.

Version Manager lets you record and organize versions, then toggle between them. A version

is a set of alternative values, formulas, and styles assigned to a named range-what-if scenarios, for instance. Version Manager automatically records the user's ID and the date for each version. Once you've created alternative versions for ranges, you group them into scenarios with the Version Manager Index. Here you choose versions you want grouped together and store them as a named scenario. A best-case scenario, for instance, might include optimistic projec-



REORGANIZE CHART DATA series easily with 1-2-3 4.0.

tions for Sales and other named ranges, such as Cost of Goods and Administrative Expenses. The same version can appear in several scenarios.

This mix-and-match flexibility of versions and scenarios lets you handle complex models easily. In contrast, Excel's scenario manager restricts each scenario to a single set of values, and you can't use alternative formulas or styles.

When it's time to sort through the alternatives, the Version Manager Index provides a



News Monitor

(continued from page 43)

annotate, and print PDF files with essential formatting, graphical elements, typefaces, and text intact. Acrobat products are expected to ship in a Windows version by June with a street price of about \$100 per user in five-user quantities, according to John Warnock, Adobe chairman and CEO. The company expects to release DOS and UNIX versions by fourth quarter 1993. Adobe says Acrobat products will store documents with their underlying file structure and formatting information. As a result, Acrobat applications can compress PDF files up to ten times more efficiently than imaging applications can compress their files. PDF files also offer better resolution on monitors and printers. In addition, because PDF files include text, you can search for words or even copy chunks of text into other applications.

GROUNDED NOTEBOOKS: At least one airline is banning the use of notebooks during takeoffs and landings, and others may follow, according to an airline trade group. Northwest Airlines now prohibits notebook use below 10,000 feet, following a recommendation in early April from the International Air Transport Association (IATA) that carriers limit the use of all electronic devices, including notebook PCs, tape players, and portable CD players, during takeoff and landing. The IATA has members from 213 airlines.

The ban was prompted by growing concern that these devices may generate interference that affects aircraft instrumentation, says IATA spokesman

(continued on page 47)

Top of the News

Continued from page 45

master list of scenarios and versions. You can scroll through them and select a set to pop into the worksheet. The Index can also sort alternatives by criteria such as range name, author, version name, and date.

What-If for Work Groups

Version Manager offers features designed to facilitate the sharing of what-if information across a network. To provide an audit trail and make tracking versions easier, it stamps each new version with the author's network,

1-2-3 4.0 for Windows

This time Lotus got it right. The flexible
Version Manager, powerful database
query tools, new graphics features, and a
revamped 3-D interface make this spreadsheet the nexus for your desktop data.
Key Features: Improved interface •
Enhanced charting • 3-D worksheets •
Version Manager • Database query tools
Pricing: \$495, upgrade \$129
Availability: June

Lotus Development Corp., 800/343-5414 Reader service no. 730 assign security attributes, such as read-only or hidden, to versions and scenarios. Version Manager also makes it easy to merge versions or scenarios from different worksheet

E-mail, or 1-2-3 4.0 ID, plus

the date and time of the entry.

Version Manager also lets you

Version Manager also makes it easy to merge versions or scenarios from different worksheet files, handy when information resides on more than one server. For example, if you're assembling a departmental budget and you need line item estimates from, say, Human Re-

sources and Information Systems, you might distribute a digital worksheet template to the appropriate managers. They could then create different versions on the template using Version Manager. You'd collect their data and use Version Manager's Merge feature to add the new versions to the original file.

A special benefit for users of *Lotus Notes* 2.1 or later—save a spreadsheet in the NS4 format, and *Notes* treats the worksheet like a *Notes* database. This means users can concurrently read and write to the file. In addition, *Notes* can notify concurrent users when

Anticipated Windows 4.0 Highlights

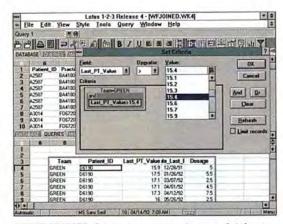
Preemptive multitasking and multithreading

Integrated Program Manager and File Manager

Integrated 32-bit operating system

Peer-to-peer networking

Document/object browser



QUERY OBJECTS give you easy access to many databases.

new versions or scenarios are posted. *Notes* also provides worksheets with its robust security and replication technology, a file updating feature that keeps worksheet versions current across the company.

Version Manager offers the best projection and what-if capabilities we've seen, but its complexity takes getting used to, and we could recommend a few improvements. For example, not being able to edit version or scenario names is inconvenient. But such minor complaints aside, 1-2-3's Version Manager is the most potent new spreadsheet tool in a long time.

Windows 4.0: It's been more than a year since Microsoft released *Windows* 3.1, and work is well under way on the next version. Windows 4.0 is expected a little more than a year from now.

Although Microsoft would not comment on this unannounced product, industry watchers say that based on what competitors are

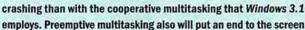
developing, Windows 4.0 will likely be a 32-bit operating system with improved multitasking, a better interface, and peer-to-peer networking. These features are also expected to appear in various combinations in products from companies such as IBM and Novell, says Andy Patrizio of the Software Industry Bulletin. Windows 4.0 will probably require a 386-class

or faster PC and 4MB of RAM. (Windows NT is aimed at 486 systems and requires 16MB of RAM).

The 32-bit capabilities could make Windows 4.0 faster than its

16-bit predecessors at running certain graphics-intensive applications such as multimedia, but possibly slower with more mundane programs such as word proces-

sors or databases, said Jeff Tarter, editor of Soft-letter. Preemptive multitasking will let users run multiple applications and tasks simultaneously with less chance of



freezes and jerking and stuttering that can occur when Windows runs multiple applications. Multithreading capabilities let an application perform several tasks simultaneously, such as printing and opening files.

According to Jesse Berst, editor and publisher of the Windows Watcher newsletter, Windows 4.0 interface improvements might include an inte-

grated Program Manager and File Manager. You also might find a browser, which would let you view various types of files or search on descriptions of items stored with the file instead of just on basic file attributes. Amy Wohl of Wohl Associates, a computer consulting company based in Bala-Cynwyd, Pennsylvania, says Microsoft might enable longer file names.



HIL WASS

Scoping Out the Spreadsheet Contenders

● = Yes ▲ = Unlimited ○ = No ase of use	123 4.0	1.2.3 1.1 1.3 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1	Excel for Winds	A VI
				9.
Drag-and-drop copy and move	•	0	•	(
Select and name discontiguous ranges	● ²	0	•	_
Right-click to change object properties	•	0	•	•
In-cell editing	•	0	0	(
Text wrap within cells	•	0	•	(
OLE client	•	0	•	•
OLE server	•	0	•	(
nalytics				
Automated multiworksheet consolidation	0	0	•	(
Automated what-if version management	•	0	•3	1
Statistical functions	54	10	71	1
Math, trig, and engineering functions	68	17	94	1
Financial functions	25	12	50	1
Outliner	0	0	•	(
resentation				
Free-floating draw objects	•	0	•	-
Edit graph objects on worksheet	•	0	0	(
Graph variables	23	6	A	
User-defined number formats	0	0	•	
Rotate cell entries	•	0	0	(
Center label in a range	•	•	•	(
Align numbers and formulas	•	0	•	
atabase access				
Relational queries	•	•	•	
Calculated output fields	•	•	•5	

The Database

Ever since the first primitive land creatures discovered *VisiCalc*, the big bugaboo for PC users has been getting numbers from the databases where they're stored and into the spreadsheet without having to retype them. 1-2-3 3.0 introduced the DataLens system for relational querying of remote databases, but that solution has confounded all but the most advanced rocket scientists. The competition offers accessory query programs—*Excel's Q+E*, for example. *QPW's* solution, a *Paradox*-style DLL, is pretty much limited to Borland's data base formats.

¹Can't drag single cells or insert a dragged range.

²Can select but not name a discontiguous range.

Restricts each scenario to single set of values.

Enter 1-2-3 4.0 for Windows. Gone are input, criteria, and output ranges. In their

place is the query object, which displays the records and fields you've selected. A query object floats on the worksheet like a graph, but you can reference the cells inside it for formulas and calculations.

To create a query, you use an integrated set of dialog boxes to indicate the table or tables you want to query (they can be spreadsheet ranges or external tables accessed through Data-Lens drivers) and the fields you want from them. A graphical dialog box provides stepby-step support as you build a selection statement. Click OK. and the items selected appear in the query object; whenever you select the object, the main menu displays the Query option to let you modify it. You can name the query and create multiple named queries on the

same worksheet. A single query object can join data from separate tables, even if they have different sources, and query objects can display group totals, averages, and so on. As with release 3.x, queries can include calculated fields.

The Checkered Flag

4 Lacks a drawing layer for

worksheet annotations.

database desktop.

5 Excel via Q+E, Quattro via

1-2-3 4.0 for Windows is an aggressive player in a red-hot spreadsheet market. For the moment, its intuitive interface, glitzy graphics, network-aware Version Manager, and new database metaphor put it ahead of the pack. But look out: In this crowd, nobody sits still for long.

-Richard Scoville and Randy Ross



News Monitor

(continued from page 45)

Terry Denny. Currently, authorities are not sure whether notebook PCs or other devices are creating the interference, Denny says. The interference level also varies from plane to plane; navigational systems on older aircraft are better shielded.

The last FAA study, conducted in 1988, concluded interference risks were minimal. But this February the FAA issued an advisory circular recommending some safety procedures and requesting comment from airlines on problems with electronic devices.

THE DOCTOR IS IN: Vendors are reacting to Compaq's enhanced serviceand-support bundle introduced in early spring for PCs sold through its direct division. The Compag bundle includes one year of on-site service with nextbusiness-day response; two years of carry-in service; and lifetime telephone support all day, every day. AST's response: its Customer Care program for Premmia and Bravo desktops that provides one year of on-site and two years of carry-in service. Customers who bought any AST system in January or later also receive this service. The extended on-site support option is \$59 for one year, \$99 for two.

NEC responded with a three-year warranty for its Image and PowerMate desktop PCs and extended on-site service at \$75 for two years. Customers who bought systems after February 1, 1993, are also eligible.

—Jeff Bertolucci, Laurianne McLaughlin, Randy Ross

In Touch on the Go

TEST DRIVE

A much improved dis-

play, a more powerful processor, a swift new communications application from Lotus Development, and the ability to run offthe-shelf DOS software make the Hewlett-Packard 100LX my constant digital companion.

HP execs say the 100LX offers "unconscious portability." In other words, I don't need to hold an internal debate on the pros and cons of lugging a 7pound modem-what some of

HP 100LX

This handy bantamweight PC runs DOS applications and includes a version of cc:Mail for on-the-go E-mail.

Key Features: cc:Mail Mobile

- Runs DOS applications
- 80C186 processor
- CGA screen

Pricing: \$749 **Availability: Immediate**

Hewlett-Packard, 503/757-2000

Reader service no. 726

you might call a notebookbefore scuttling to various meetings and cities. As a frequent traveler, I find a double meaning in HP's notion of unconscious portability, but that's another story. Suffice it to say that taking the 11ounce 100LX with me soon became a no-brainer.

A proto-PDA (personal digital assistant), the 100LX is great for burst-mode communications. With its PCMCIA 2.0 slot, you can add devices such as a modem. The bundled cc:Mail Mobile software is easy to use, and unlike with the clunky cc:Mail Remote on my notebook, its interface lets you conduct all your communications and manage your mailbox from one menu bar via drop-down menus and pop-up dialog boxes. In the new interactive mode, you can view your in-box and select only those messages that you want to read and respond to, much as you can in the desktop version of cc:Mail.

HP also improved ergonomics

and muscle tone in the 100LX. The screen is the same size as the 95LX's, but its CGA display has 16 shades of gray and 25line-by-80-character resolution. The 3-volt 100LX offers twice the battery life of the 95LX, yet it still requires just two AA batteries, which you can now re-

THE 100LX

has built-in E-mail.

RAM and the power of an IBM PC XT with the 100LX; its 7.9-MHz 80C186 is 50 percent faster than the NEC V20 in the 95LX. A 9-pin serial port facilitates external modem and desktop hookups.

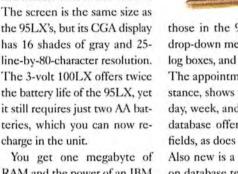
You can run DOS apps up to 300K in size, and the PIM applets are much improved over

those in the 95LX, thanks to drop-down menus, pop-up dialog boxes, and added functions. The appointment book, for instance, shows your schedule in day, week, and month views. A database offers user-definable fields, as does the phone book. Also new is a note taker, built on database technology so you can do word searches.

Like the 95LX, the 100LX suffers from a lilliputian keyboard, but the layout is improved, and a new color scheme makes keys easier to find.

The 100LX retails for \$749, with a street price of \$699.

-Russell Glitman



Low-Cost Presentation Software: Alpha Software's

\$79 Bravo offers features comparable to those of leading presentation graphics products that have street prices around \$350.

Bravo offers several tools to help users work quickly. The package includes an outliner and a sorter to help you develop and organize ideas, a feature to let you print speaker's notes and handouts, and more than 60 design templates so you can create professionallooking presentations rapidly. These ready-made backgrounds are similar to those in Freelance Graphics' SmartMasters. Bravo's slideshow feature, which is also similar to its Freelance counterpart, lets you reorder screens and run your presentation.

For saving and modifying a presentation over time, Bravo allows users to create customized templates, a key feature found also in both Freelance Graphics and Harvard Graphics. According to Alpha Software's director of business development, Tim Stein, the program enables you to import data from Windows spreadsheets such as Excel, and you can also update a presentation as your spreadsheet changes using Dynamic Data Exchange (DDE).

Along with the standard text and graphics features, you get a number of extras. You can change kerning (the spacing between let-

ters) and condense, slant, and rotate text. Bravo's ten drawing tools are comparable to those of its more expensive competitors.

The software supports object linking and embedding (OLE), which means that multimedia fans can add sound or other OLE objects to their presentations. Alpha Software, 617/229-2924. Reader service no. 727



Get a hold of the best value in LAN power protection

Now just \$139! suggested list price

Back-UPS

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

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

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

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



- ABSOLUTE™ Protection guarantees repair or replacement of equipment (up to \$25,000) if damaged by a surge while protected by a properly installed Back-UPS (See warranty for details).
- UL, CSA and Novell approved with a 2 year warranty
 - Full-time surge protection and line
 - Most models include LAN interface for automatic-shutdown of Novell, LAN Manager, LAN Server, LANtastic, Banyan, SCO Unix, and others
 - Ask about PowerChute® UPS monitoring software and Novell compatible UPS monitoring boards
 - ■230V models available





Model **New List** Application \$139 Back-UPS 250 LAN nodes, 386SX, 286, internet hardware, POS \$189 Back-UPS 400 Desktop 386, 486 systems, 286 servers \$229 Back-UPS 450 Tower 386, 486 systems, servers \$279 Back-UPS 600 Heavily configured systems, CAD/CAM workstations \$449 \$399 Back-UPS 900 Multiple systems, longer runtime applications \$599

NEW! NEW!

Back-UPS 1250 Multiple systems, LAN hubs, small minis, telecom \$799 equipment

Γhe Back-UPS

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

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

D1992. Back-UPS, PowerChute, Gustanteed ABSOLUTE Protection are trademarks of APC. All other trademarks are property of their respective owners.

HP LaserJet 4L Makes Itself at Home

TEST DRIVE

Life is full of trade-offs.

Take low-cost, 300-dpi personal laser printers. If you're looking for an office workhorse with speed and upgradability, you

might consider Texas Instruments' \$729 Micro-Writer or Epson's \$799 Action Laser 1000. If you value aesthetics and ease of use over performance, Hewlett-Packard's \$849 LaserJet 4L is the better choice. With its sleek design, light weight, and ergonomic enhancements, the HP 4L is stylish and unobtrusive. The trade-off with this great-looking machine? According to the PC World Test Lab, the HP 4L proved one of the slowest, least upgradable lasers in its price range.

When Small Is Beautiful

Aesthetics are a matter of personal preference. For a cramped desk, we like petite. The HP 4L's 14.5-by-14-inch footprint is comparable to the TI's and the Epson's; the real differences lie

HP LaserJet 4L

Basic laser performance in a small, well-tailored package makes this a good choice for high-profile locations and small offices.

Key Features: Low cost . Small footprint . Stylish appearance . PCL 5 and 26 scalable fonts . Power- and toner-conservation features Pricing: \$849 Availability: Immediate Hewlett-Packard, 800/752-0900

in height and weight. The LaserJet 4L is just 6.5 inches high and weighs only 15.5 pounds. The Epson is 9 inches high and clocks in at 22 pounds, while the TI weighs 33 pounds. and Microfine toner to produce

300-dpi print quality. Resolution enhancement isn't available on the TI and comes only as an option on the Epson. HP also uses a compression algo-

Parama Compage

The HP 4L SAVES YOU MONEY on energy and printing costs.

Besides being sleek, the 4L is convenient. Doors on the side hide connectors for the power cord and printer cable. The front and top are free of buttons, switches, and LCD panels. Four small status lights indicate operations, such as printing in progress, and problems, such as paper jams. The 4L doesn't have an on/off switch. It turns on when you plug it in; powers down after each print job; and starts up when you send it a print job, touch the front panel button, open the top door, or insert paper. Printing when the 4L was powered down produced no noticeable delay.

In today's economy, frugal is also attractive. A draft mode, called EconoMode, conserves toner. HP claims this feature, which yields light but readable output, can cut printing costs in half. Unfortunately, this draft mode doesn't speed printing.

Full Featured, Multitalented

The printer uses HP's Resolution Enhancement Technology rithm, called Memory Enhancement, to make the printer's standard 1MB of RAM work like 2MB. As a result, HP claims, you won't need more RAM to print full-page 300-dpi graphics, although the 4L sup-

ports 2MB.

In addition, the 4L includes HP's PCL 5 and 26 scalable Intellifonts, features neither the TI nor the Epson offers. A Bi-Tronics parallel port provides high-speed and two-way communications. The latter lets you change printer settings and view status messages from your

PC. The printer is rated at 8000 pages per month, midway between the Epson's 11,000 pages and the TI's 5000.

The 4L is powered by a 4page-per-minute Canon engine and a Motorola 68000 proces-

sor. Although many

personal lasers use the same processor, some, such as the TI and Epson, employ a faster engine. And that appears to make a difference. In PC World Test Lab performance, the HP 4L's average

times were 39 percent slower than the Epson's and 21 percent slower than the TI's.

The 4L's limited upgradability is another drawback. Unlike its two competitors, the HP 4L can't be upgraded for Post-Script. In addition, you can't expand its 100-sheet capacity by adding a second paper cassette. The single cassette handles A4, executive, letter-, and legal-size paper; a manual-feed slot handles envelopes, labels, and transparencies.

The HP 4L isn't for everybody or for every situation. But if you're looking for style, functionality, and basic laser performance, look no further.

-Randy Ross

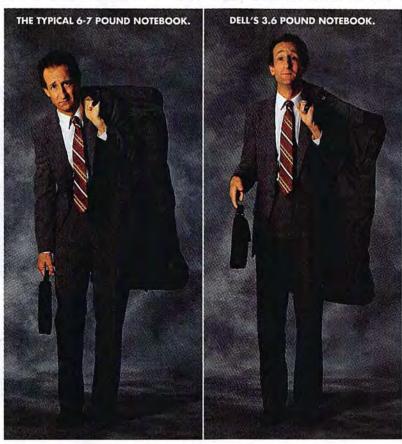
hilean ambassador ving awareness tha sador explained th ness that political i instability and the

hilean ambassador ving awareness tha sador explained th ness that political i instability and the

THE PRINT QUALITY OF HP LASERJET 4L OUTPUT, shown at right, is comparable to output from the much pricier HP LaserJet IIIsi.

Reader service no. 728

LOSE UP TO 3 POUNDS OVERNIGHT.







What most people call a notebook, we call obese. The NEW Dell® 325SLi weighs 3.6 lbs. and is a scant 7 ¾" x 11," and 1 ¼" thick. Our competitors' notebooks weigh nearly twice as much, and they don't even bother trying to hide it.



The notebook's smaller, not the keyboard. The 325SLi has a full 85-key keyboard with special screen navigation keys, and a built-in keyboard mouse.



This small number gets you all these big numbers: 25MHz i386™ SL processor, 2MB of RAM, 60MB hard drive, 16KB cache, VGA Reflective (9.5″, 640 x 480) LCD, external 3.5″ diskette drive, and up to 4 hours of work from the NiMH battery. Not to mention MS-DOS™, Windows, and a mouse. And if you're really hungry for power, we can custom configure a system for you with up to 10MB RAM and 200MB hard drive.



*Prices valid in U.S. only. Some products and promotions not available in Canada or Mexico. No other discounts apply, *Leasing arranged by Leasing Group, Inc. Intel and the Intel Inside logo are registered trademarks and i386 is a trademark of Intel Corporation. Ms-DOS is a registered trademark of Microsoft Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1993 Dell Computer Corporation. All rights reserved.





800-626-4809

WHEN CALLING, PLEASE REFERENCE #11DBC.

HOURS: 7AM-9PM CT MON-FRI, 8AM-4PM CT SAT, 10AM-3PM CT SUN.
IN CANADA, CALL 800-668-3021. IN MEXICO CITY, 228-7811.

The Way Works S Forces Yo

Introducing Claris

All works software claims to be integrated. But just try working with one. You'll find yourself switching back and forth from module to module. Cutting and pasting as you go. It feels anything but integrated.

That's why we designed ClarisWorks™ for Windows to perform like a single application. With word processing, spreadsheet, database and graphics tools all easily at hand. So you can move effortlessly from one set of tools to another. Without jumping from one screen to another.

Stewart Alsop's P.C. Letter said "If you want a glimpse of what the future



"Instead of opening separate applications to create a worksheet and write a letter, ClarisWorks puts a single document on the screen," PC Computing-March 1993

\$99*Special Introductory Price. See Your Claris Dealer.

Works for Windows.

holds look no further than ClarisWorks for Windows...the seamlessness with which a user can move from task to task suggests a new class of 'multifunctional' software."

PC Computing advised "If you're considering an integrated Windows program this is it...all the

features of other integrated packages such as Microsoft Works for Windows...built around the best and most advanced user interface we've seen in this class of program."

ClarisWorks requires a mere 2MB of RAM and 5MB of hard disk. Call today for

a demo disk. Or take advantage of our \$99 introductory offer. And put the best integrated works software for Windows to work for you.



Call 1-800-356-6657, ext. 39. Or Ask For A Free Demo Disk.

trademark and ClarisWorks and ClarisWorks 1.0 Design and Simply powerful software are trademarks of Claris Corporation. All other trademarks or brand names are the property of their respective.



cc:Mail for Windows Plays by Your Rules

ersion 2.0 of cc:Mail for Windows comes to market with a powerful rules-based messaging feature that can automatically route your electronic mail to other users, store your messages in folders, and perform additional tasks for you. Version 2.0's redesigned interface makes it simpler for you to keep track of your incoming messages, folders, and bulletin board announcements. An improved text editor, a new spelling checker, better search capabilities, and a draft folder make the program easier to use.

Making the Rules

Help

Undoubtedly cc:Mail's greatest improvement is its rules-based processing. Lotus officials claim

While on vacation

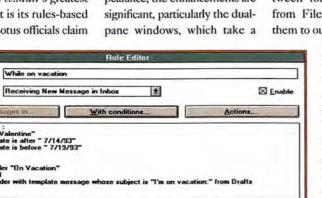
to Folder "On Vacation"

"total expenditures" could go to your budget folder.

Lotus product manager Karl Wong says cc:Mail for Windows' rules were designed with average business users in mind. You don't have to learn programming-like commands, and there are no difficult instructions. Instead, you establish rules using pick lists of predefined actions that perform tasks based on criteria such as message author or send time. Context-sensitive help is available for each step.

Enhanced Interface

Although Lotus wisely avoided making too many drastic changes to the program's appearance, the enhancements are



Save as new Save Cancel

CC:MAIL FOR WINDOWS' ENHANCED INTERFACE makes it easier to point-andclick your way between in-box, folders, and bulletin boards.

rules let you automate any cc:Mail task that you currently do manually. Before leaving on vacation, you might use rules to forward incoming mail automatically to an assistant and send a form letter to each mail sender informing him or her of your absence. Or you might automatically forward messages that contain certain keywords or text strings to a specific foldermessages containing the string cue from Windows' File Manager. A Container List pane on the left shows a collapsible outline of icons for the Inbox, Bulletin Board list, Folders, and so on; the right Contents List pane shows the headings of the items (Messages, Bulletin Boards, and so on) belonging to the item selected in the left pane; and a slider bar enables you to adjust the split between the panes. You can

Silver's Mail Map Teresa Rizzo al Silver HQ 07/16/93 1kt Message Log Jacques Sage at Silver-HQ Cindee Martin at Silver HO 07/21/93 14.1 New Expo e Reporting A TERESA RIZZO 07/25/93 1kt Calendar Folders TERESA RIZZO 07/25/93 1k t Follow-up 07/12/93 Stock Price 7/11/93 Msg from Teresa Project Purple **Bulletin Boards** Teresa Rizzo 07/02/93 #Company News 07/07/93 Jacques Sag 14.1 #Company Policie Sales Issues on Product I Jacques Sage 07/10/93 1k L 07/10/93 #Headquarters Ha John Valente 07/08/93 Purple One Month Early! Tk t #News Clippings Jacques Sage 07/08/93 10k 8 Monthly Sales Results #Non-Product Sug Denise Alison at Silver HQ 07/01/93 Press Release on \$75 Milio #Product Su #Product Sugges 07/01/93 Stock Price 6/28/93* Teresa Rizzo 06/25/93 2k t Stock Price 6/24/93* feb93 07/05/93 Jacques Sage 10k f Monthly Sales Results jan93 Receipt of 7/5/33 7:17PM m 07/05/93 1k t mar93 NEW RULES-BASED MESSAGING in cc: Mail for Windows 2.0 lets you automatically route messages to other users and file mail into folders. also drag and drop messages be-You can now import and extween folders and drag files port text directly from files from File Manager to attach without having to use the Windows Clipboard. And advanced

Author Teresa Rizzo

them to outgoing messages.

The draft and trash folders, which were first featured cc:Mail for DOS 4.0, appear in the Windows version as well. The draft folder allows you to save a message as a draft document and revise it later, while the trash folder enables you to undelete any messages you erased by accident and con-

trol how long cc:Mail for Windows stores deleted messages.

Easier Editing

You'll also notice an improved text editor in version 2.0-a change that cc:Mail for Windows 1.1 users will welcome. A new spelling checker, based on the 190,000-word Houghton Mifflin dictionary (the same found in other Lotus products), cuts down on misspelled memos.

search-and-replace capabilities allow you to retrieve messages from your mail folders and directories.

Disk Space

cc:Mail for Windows 2.0 retains the pricing of the previous version. The server-based Platform Pack lists for \$495. cc:Mail for Windows 2.0 User Packs cost \$345 for 10 users, \$845 for 25 users, and \$3295 for 100 users.

-Jeff Bertolucci

cc:Mail for Windows 2.0

Powerful new features of this popular E-mail program include rules-based mail and an enhanced interface. Pricing: \$345 to \$3295, plus \$495 for server pack Availability: Immediate Lotus Development Corp., 415/961-8800, 415/961-8400 (fax) Reader service no. 729

We just removed the one thing that kept you from buying a high quality color printer.

\$ 9950

Introducing the

Primera

COLOR PRINTER

Finally – great color that's affordable.

New from FARGO, the Primera Color Printer delivers rich, vibrant color for stunning presentation graphics and transparencies. All in just over two minutes per page! But at just \$995, it's thousands of dollars less than other high quality color printers. So if you're shopping for a color printer but don't

want to spend all that money, check out the new Primera Color Printer. It'll make you look as brilliant as your presentations.

- Up to four times faster than ink jet printers
- Microsoft® Windows™ 3.1 driver included
- Thermal transfer print quality
- Monochrome ribbon available for near-laser quality text-only printing
 Circle 100 on reader service card



For more information, call



7901 Flying Cloud Drive Eden Prairie, MN 55344 U.S.A.

1-800-FARGO-22

Ext. 700 (1-800-327-4622) 612-941-9470 FAX: 612-941-7836

Primera is a trademark and FARGO is a registered trademark of FARGO Electronics, Incorporated. Microsoft is a registered trademark and Windows is a trademark of Microsoft Corporation. © 1992 FARGO Electronics, Incorporated. All rights reserved. "Suggested U.S. Retail Price.

How to Survive If Your PC Maker Doesn't

hen Sam Watts bought his 486 Windows Power Station PC from Compu-Sys, a direct vendor based in Irwindale, California, he thought he got a good deal. "It looked like the best bang for the buck," Watts says. But when his system arrived, it lacked the \$265 fax-modem he had ordered, as well as proper documentation and the correct monitor cable. Watt called Compu-Sys two days later but "got no one," he says. After several days of calling, Watts finally reached a recording that said Compu-Sys was out of business.

Since Watts's credit card payment had already cleared, he was out \$265. As if that wasn't enough, he had to drive 45 miles from his home in Branson, Missouri, to a computer repair shop in Springfield and spend \$100 to get his new computer in working order.

Buying Smart in Tough Times

Watts's hard-luck story isn't unique. An increasing number of PC buyers are finding that their vendors have suddenly closed shop. As major companies like AST, Compaq, Dell, and IBM continue to slash prices and add features to their low-end lines, smaller vendors, unable to survive on evershrinking profit margins, bite the dust. Recent casualties include LodeStar Computers of City of Industry, California, and FastMicro of Phoenix, Arizona.

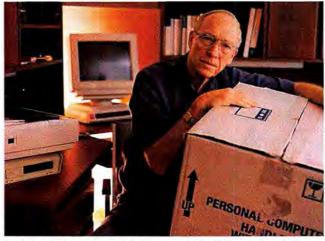
Hugo Huapaya of Miami Springs, Florida, bought a 50-MHz 486DX system from LodeStar Computers in December 1992. When his system arrived in January, Huapaya noticed a number of things wrong with it. The system booted slowly, and neither the local bus design nor the mouse driver was what he had ordered.

Huapaya shipped his system back to LodeStar. "About three weeks later I got the system back with a note saying [LodeStar] had moved," Huapaya says. Now he has a computer he doesn't want, and his vendor is out of business.

Wisely, Huapaya had paid by credit card and immediately disputed the LodeStar charge, so he hasn't had to pay for the system. However, the disputed amount is still on his credit card statement, and Huapaya says it will take "a few more months" to clear the charge.

Know Thy Vendor

What's a savvy buyer to do? Use common sense, says Jennifer Crowl, spokesperson for the Direct Marketing Association in New York. To check a vendor's reputation for honesty and pro-



BUYER BEWARE: Sam Watts received his 486 PC without the faxmodern he ordered; when he called his vendor, it had closed shop.

fessionalism, Crowl recommends calling the Better Business Bureau in the city where the vendor is based. Ask if any complaints have been filed against the company, she says. And if you've never heard of the vendor, ask your colleagues and associates whether they've done business with the firm.

The smart buyer also investigates how long the vendor has been in business, says Robert Zises, president of the National Computer Exchange in New York. He also recommends running a financial check on the company and calling the Consumer Affairs Department in the vendor's home state.

More tips from Zises: Get everything in writing, and always know the terms of your transaction. Take time to check

> out new equipment thoroughly, and ensure that the components and the configuration you receive are exactly what you ordered.

You may also want to sign a contract with a third-party service provider. Although most vendors provide at least one year of service with their systems (usually through an outside vendor), these contracts usually are void if the system vendor goes out of business.

-Jeff Bertolucci

Buying During a Shakeout: Smart Tips for Savvy Shoppers

- 1 Check the Better Business Bureau in the vendor's city as well as the state Consumer Affairs Department to determine if complaints have been filed against the company.
- 2 Ask colleagues and business associates if they've done business with the company.
- 3 Get written confirmation from the vendor about pricing, warranty, and return policy.
- Verify availability of merchandise and ship dates.
- Don't pay cash. Use a credit card.
- When your equipment arrives, make sure the configuration and components are what you ordered.

- If the equipment is defective, keep a written diary of its problems and the steps you've taken to correct them (including phone calls to the vendor and return ship dates).
- Before you return defective equipment, get a return merchandise authorization from the vendor.
- Sign a service contract with a thirdparty service provider.





Animal!

Guaranteed Price

We guarantee we'll sell you this 1994 upgrade at the best market price. At press time for this ad, we didn't have enough information to quote a price, but you can be sure it'll be terrific, possibly as low as \$500. Call for details! The Pentium technology price guarantee is for a limited time only. If you purchase a Gateway 2000 Pentium technology ready system by August 15, 1993, you'll receive a written price guarantee for the processor you can buy in 1994.

Guaranteed Availability

We guarantee you can be among the first to get this nextgeneration OverDrive processor when it goes on the market. When you buy your 486 Pentium technology ready system this summer, you'll receive a personal upgrade reservation number. It's your guarantee of a special place in line to acquire this next-generation OverDrive processor when it ships in 1994. Our supply of upgrade processors will be offered in sequence to customers holding these reservation numbers. The sooner you buy your 486 system, the sooner you can get your OverDrive.

Get A Gateway During 486 Fest — It's The Smart Technology Move

When you buy a Gateway 2000 Pentium technology ready system during 486 Fest, you're investing in your technology future for a fraction of what you would pay for a Pentiumbased system today.

Aren't you glad you peeked at our gift? Now you know Gateway 2000 offers the best value — today *and* tomorrow.





We K

With Gateway's Pentium™ Technology Guarantee, You Have A Good Reason To Celebrate!

If you've been worried about keeping up with technology now that Intel's® Pentium processor has been announced, relax! Kick back and join the Gateway 2000 486 Fest, featuring great buys on 486 systems and our Pentium Technology Guarantee. It's a Gateway-exclusive offer that allows you to keep up with technology *and* save big bucks when you buy a Gateway 486 Pentium technology ready system this summer!



Guaranteed Upgradeability

We guarantee you can upgrade your Gateway 486 Pentium technology ready system to future Pentium processor technology products in 1994. This next-generation OverDrive processor will easily plug right into the ZIF (zero insertion force) socket already installed on your upgradeable Gateway 2000 system with no modifications. And, unlike many manufacturers, we've already had our systems heat tested for use with Pentium technology processors.

Guaranteed Performance

We *guarantee* your upgrade to Pentium technology will accelerate overall system performance by 50 to 100%. It's likely that your upgraded 486 system will outperform Pentium systems on the market today.



More Reasons To Go Hog-Wild During

Need a reason to celebrate? We're making this the best summer ever to buy a Gateway PC! During our 486 Fest, you'll find better-than-ever buys on all the fabulous systems in our product line. You'll think you died and went to hog heaven! Buy some fiesta goodies, invite a few party animals over and call us. We'll give you lots of reasons to party!

Party Reason — Choosing a 486 system shows you're a smart buyer!

A less astute buyer might go for a 386 or Pentium[™] system, but you know where the real value is. Gateway 2000's desktop and Nomad PCs are now all 486 systems for good reason. With our great prices on 486 technology, 386 systems are no longer a smart buy. And first-generation Pentium systems are not a

good value.

Even if you were willing to pay
the steep premium other manufacturers are charging for Pentium
systems, you'd have trouble getting one
because availability is extremely limited.
Our engineers say the Pentium systems in
our lab run so hot, you could use one to
heat a hog barn. Besides, Pentium systems
on the market today will be outperformed
quickly by improvements in Pentium
technology. That's why we're not selling
Pentium systems yet. At Gateway, we
won't sell anything unless it's a good value
for you.

In today's market a 486 machine is the way to go, especially now that all of our desktop ISA systems are Pentium technology ready and guaranteed to be upgradeable.

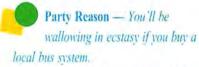
Party Reason — If you pick a mini desktop, you'll save enough to invite the whole barnyard to your party.

Gateway's mini-desktop systems -4SX-25, 4SX-33 and 4DX-33 — are petite but powerful, based on an integrated design that incorporates many subsystems on the motherboard for the best priceperformance ratio. All mini desktop systems include: 4 to 8MB RAM; a large and fast hard drive, operating on the local bus for even faster drive performance: a fast video chipset with 1MB; a brilliant, crisp display from the standard 14-inch CrystalScan[™] non-interlaced, .28mm dot pitch color monitor; and more available expansion slots than you find in most small-footprint PCs. The combination of these features makes a cool Windows™



Sateway's 486 Fest!

machine for an unbeatable price. Now that's cause for celebration!



Go ahead and splurge on our 4DX2-50V or 4DX2-66V models. We put ATI's™ Graphics Ultra Pro video card with 1MB VRAM on our VESA® local bus for results that will be the hit of your party.



Plus, these systems have a hefty 8 or 16MB RAM with cache, and party-hearty hard drives running on the local bus. You get an extra VESA local bus expansion

Slot, a 15-inch flat, square
CrystalScan color monitor, and
more free choices of application

software than you'll find anywhere else.

Party Reason — You'll get the CD-ROM drive you always wanted.

It's included with our 4DX2-66 systems! Or you can upgrade any other standard configuration with a CD-ROM. We supply a free system CD when you purchase a PC with a CD-ROM drive. The CD includes Microsoft's® Multimedia Pack,™ designed to let you explore the value of multimedia technology. You get an interactive user's guide to Windows and a collection of sound, animation and video clips to use in business presentations and documents.

Party Reason— You can have it your way at Gateway.

We custom build each Gateway 2000 computer to your order. We'll gladly provide you with a quote on a special configuration. Call our sales department!

Party Reason - You'll save money!

Check the configurations and prices on the back page of this ad. We've gone hogwild for 486 Fest!

Party Reason — The wrappings!

Your Gateway system comes in a black-and-white cow-spotted box. Some people use our boxes for end tables and playroom furniture. It will certainly be a conversation-starter at your party.

Party Reason — Get our 486 Fest Best Buy!

Check the back page of this ad for an unbelievably good buy on a smart 4DX2-66 local bus system configuration including 8MB RAM, 340MB hard drive and CD-ROM for only \$2495!



Party On With Value-Priced Portable

Keep counting the reasons to celebrate during Gateway's 486 Fest! You'll find plenty when you look at our Nomad notebook PCs and computer peripherals!

Nomad Notebooks

Party Reason — You'll get 486 desktop performance in a lightweight portable when you huy a Nomad.

Why settle for a 386 notebook when you can get a powerful 486 Nomad in the same price range? All three Gateway 2000 Nomad models are 486 systems with snappy performance that's still rare in notebooks. Plus, they're smaller than many notebooks, weighing just 5.6 pounds and measuring 8.5" x 11" x 1.8". No other notebook this size can beat the Nomad 450DXL's combination of performance and battery life! In PC Magazine's Battery Rundown Test, Nomad systems operated up to six hours on a single battery with power management enabled.

Party Reason — No more squinting at a dim and fuzzy display!

Nomad screens are big and brilliant — a full 10" VGA backlit display with 64 gray scale. You can use your Nomad in all lighting conditions.

Party Reason — Three cheers for a great keyboard and mouse!

Nice feel! The 79-key touch-type keyboard is comfortable, quiet and fast.

Nomad 450DXL models now also include Microsoft's® Ballpoint™ portable mouse with Quickport,™ standard.

We have lots of options for our Nomads, too. Call for details!

Peripherals

Party Reason — You'll save money on connectivity tools!

TelePath Fax/Modem. It's everything you ever wanted in an internal fax/modem, including a great price! The Gateway 2000 TelePath is a 14,400bps modem, V.32bis, with 9,600bps fax capability. It's compatible with the standard AT command set and is downwardly compatible with

lower modem speeds. Package includes software — WinFax Pro,® Crosstalk™ for Windows and Qmodem — plus a free CompuServe® trial membership. \$195

Network Cards. Call for a selection of Ethernet cards and Token Ring adapters, installed and configured.

Microsoft Windows™ for WorkGroups.

Networking made easy! Share files and printers, send electronic mail, schedule group meetings with the click of your mouse — and get everything you need in one inexpensive package. That's the beauty of Windows for Workgroups. Even a beginner can set up and configure a network with this fantastic product. Price includes an Ethernet adapter and software. Hardware and software are factory-installed. \$159

Party Reason — You'll save money on multimedia software and peripherals!

CD-ROM Kit. You'll enter a whole new world of possibilities with your PC when you add a CD-ROM drive, giving you access to exciting new applications, databases and entertainment programs. With applications continually getting bigger, wouldn't it be convenient to get software on a single CD rather than piles of floppy disks?



And Peripherals!

Comparable CD-ROM drives usually retail for over \$400. Manufactured specially for Gateway 2000, this kit includes CD-ROM, interface card and everything you need to add MPC-compliant CD-ROM to your PC. \$225

Microsoft Windows Sound System.™

Here's the sound system designed for business, complete with a headset for private office use. You can "speak" commands to your PC for hands-free operation. Let your PC read numbers back to you for proofing spreadsheets. Embed audio messages in Windows OLE applications. Add audio to screen savers. Play your Ad Lib® and Sound Blaster™ games — and more! Our special Gateway price includes soundboard, microphone, headset and software. \$149

Party Reason — You'll save money on all kinds of extras from Gateway!

Colorado Memory Systems™ TBU.

250MB internal automatic tape backup unit copies up to 9.5MB per minute with high-speed data compression. Reads previously formatted Archive™ tapes, too. Comes with easy-to-use DOS software, one tape and cable. 486 Fest price: \$195!

CrystalScan™ 15-Inch Monitor.

Non-interlaced color monitor with flat, square screen. If the system you want is advertised with a 14-inch monitor, you can upgrade at the time of purchase to a 15-inch monitor for only \$100.

Panasonic® KXP2123 Color-Capable

Printer. Add color to your documents with this 24-pin dot matrix printer. Includes Adobe Type Manager.®

Call for 486 ==est price!

Texas Instruments® MicroLaser™ Plus

Laser Printer. Never before has such a small, Postscript® laser printer offered so much speed and economy. The MicroLaser Plus is only 13.4" x 14.2", yet it prints 9 pages per minute at 300dpi. Call for 486 Fest price!



We offer many other system options and upgrades, including 17" and 20" monitors, tape backup units, bigger hard drives, other software and more! Call today!

The software and 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





800-846-2065

Celebrate! We Give You More Softwar

That's right! We have even more reasons to party during Gateway's 486 Fest! We offer more free choices of application software with our systems than any other manufacturer. Plus, all software is preinstalled and ready to run the moment your system arrives. Hooray! No installation hassles!

With Nomad, mini desktop and our 4DX2-66 Best Buy systems, you get Works, one of the best integrated software packages on the market.

Party Reason — Microsoft Works for Windows.™

Works for Windows is the single program that combines all the tools you need to run a business: word processor, spreadsheet, database and electronic communications. It's simple to use yet provides power and functionality for advanced users.

With desktop and tower systems that include "choice of application software," you can select one of the following software packages. All applications are the latest versions.

Party Reason — Microsoft Excel for Windows.**

Microsoft Excel gives you unprecedented power and analytical functions, outstanding reporting and presentation tools, and easy charting. Includes faster ways to work. Reviewers consistently choose Excel as the best spreadsheet for Windows. It's an *InfoWorld* Product of the Year!



Party Reason — Microsoft Word for Windows.™

The original word-processing application for Windows is still the best selling! Drag and drop text and graphics around the page for easy creation of professional-looking documents. Existing

WordPerfect® files (and other file

formats) are usable in Word. You can even type a WordPerfect command and see Word's equivalent command automatically demonstrated on-screen!

Party Reason — Microsoft Word and Bookshelf 92.* CD-ROM Edition.

The most popular word processor for Windows now becomes the ultimate writing tool with an entire electronic reference library full of multimedia sights and sounds! Includes dictionary, encyclopedia, thesaurus, atlas, quotations, and more.

Party Reason — Microsoft PowerPoint for Windows. 500

For easy, professional on-screen slide shows, overhead transparencies or 35mm slide presentations. Fast and flexible word processing, graphing, outlining and drawing tools give you more time to master your content instead of wrestling with your software.





Choices To Crow About!



Party Reason — Microsoft Project for Windows.™

Project management is easier and more flexible than ever! This program gives you the power and versatility to manage your schedules and resources more efficiently. That's why PC Magazine.

PC Week. PC World and Software Digest call Project the best program in its category!

Party Reason — The MS Entrepreneur Pack.

Four great software packages in one! Microsoft Works, Publisher, Money and an Entertainment Pack.

Party Reason — Borland Paradox® for Windows.

Paradox for Windows is the relational database that makes a powerful database easy to use. Now you have complete access to data, plus all the tools you need to create graphical applications in no time. Paradox

for Windows works with existing Paradox for DOS and dBASE files without modification.

Party Reason — The Windows Programmer Pack.

Get everything you need to
create programs for Windows: Microsoft
QuickC for Windows,™ Visual Basic for
Windows,™ Windows Control Development
Kit.™ Windows Help Compiler™ and
Windows Programmer's On-Line
Reference.™

Party Reason — Upgrade to the CD-ROM Edition of Microsoft Office.¹⁵⁶

You can upgrade from a choice of application software to Microsoft Office, CD-ROM version, for only \$99! This single package has all the leading Windows applications: Word, Excel and PowerPoint.

The standard edition of MS Office is also available as an upgrade from a choice of application software for \$175, or \$499 as a second application.

Party Reason -

Upgrade from Works to choice of application.

If the system you want comes with MS Works for Windows, you can upgrade to a choice of application software for only \$100.

Software shown here is sold only with the purchase of a system. Software sold with systems includes the identical applications contained in retail packages but will not include the retail box. You get all master diskettes and manuals, shrink-wrapped and packaged in a Gateway 2000 box.







The Whole Herd Is Dedicated To Pro

Yes, this is the whole gang at Gateway 2000. We now number in excess of 2,000 people. We gathered everyone together for this 486 Fest kick-off photo so you could see all the friends you have in the business, and so we could renew our commitment to your complete satisfaction.

Despite some blustery weather, Ted, our president and founder, gave us an inspiring pep talk about customer satisfaction and value. He reminded us that we will be the best in this industry only as long as we remember the guiding principles of our company, best described in our mission statement:

We are Gateway 2000.

We care about and respect you, our customers.

We pledge to you that we will be honest, courteous and friendly.

If we make a mistake, we will admit it.

If you're unhappy about something, we'll do everything in our power to make it right. We'll treat you as an individual and take special care to see that your individual situation is handled fairly.

We have fun working together, striving to be the most knowledgeable, productive and successful team in the world. We blend our talents to continually offer higher quality, more innovative and useful products, at a value unmatched by competitors.

We will always be happy but we will never be satisfied.

And we will continually improve everything we do.

We will succeed, together as a team.

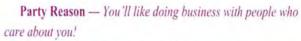
We are Gateway 2000.

We are the only logical choice!





ling You With The Best Service!



Each and every person in this photo rededicated his or her efforts to achieving these goals. Like a married couple going through a second wedding ceremony after many years of marriage, our energies were refocused on what's important. And what's important to us is you!

Party Reason — You get excellent after-the-sale support!

Every Gateway 2000 system comes with a 30-day money-back guarantee. If you don't like your system, send it back within 30 days for a refund. All systems come with a one-year limited warranty and telephone technical support for the life of the system from our award-winning tech department. You also get an automated fax service to supply you with detailed documentation on over 150 technical subjects, and a lifetime BBS

membership for additional technical support and online forums. offer on-site service to most locations

We offer on-site service to most locations in the country (factory service only for notebooks). Replacement parts leave our factory as quickly as possible; we pay overnight shipping. Plus we now have interactive documentation on desktop systems with pictures and text right on your hard drive (in addition to comprehensive hardware and software manuals).

Party Reason - It's so easy! Just give us a call!

We make it easy for you to buy a Gateway PC, with convenient payment options including major credit cards and C.O.D. terms. Net 30-day terms and leasing options are also available to qualified commercial customers.



For a truly celebrated value, the choice is black-and-white: Gateway's 4DX-33.













Gateway 2000's Party List



4SX-25

- 25MHz 486SX Intel® Processor
- 4MB RAM
- 3.5" Diskette Drive
- 80MB 17ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- Windows Accelerated Video w/1MB DRAM
- 14" Color CrystalScan™ 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey Keyboard
- MS-DOS* 6, Diags, Windows & Mouse
- MS Works for Windows 2.0

\$1295

4DX2-50V

- 50MHz 486DX2 Intel Processor
- 8MB RAM, 64K Cache
- 5.25" & 3.5" Diskette Drives
- 212MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- ATI Ultra Pro Video w/IMB VRAM on VL-Bus"
- 15" Color CrystalScan 1572FS
- Desktop Case (Tower Upgrade)
- 7 16-Bit ISA Slots, 2 on VL-Bus
- 124-Key AnyKey Keyboard
- MS-DOS 6, Diags, Windows & Mouse
- Choice of Application Software

4DX2-66E

- 66MHz 486DX2 Intel Processor
- 8MB RAM, 256K Cache
- 5.25" & 3.5" Diskette Drives
- 500MB 11ms SCSI Hard Drive
- 32-Bit EISA SCSI Controller
- Windows Accelerated Video w/ 1MB DRAM
- 14" Color CrystalScan 1024NI
- Tower Case
- 8 32-Bit EISA Slots
- 124-Key AnyKey Keyboard
- MS-DOS 6, Diags, Windows & Mouse
- Choice of Application Software

\$3495











4SX-33

- 33MHz 486SX Intel Processor
- 4MB RAM
- 5.25" & 3.5" Diskette Drives
- 170MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- Windows Accelerated Video w/ IMB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey Keyboard
- MS-DOS 6, Diags, Windows & Mouse

4DX2-66 BEST BUY

MS Works for Windows 2.0.

66MHz 486DX2 Intel Processor

340MB 13ms IDE Hard Drive

14" Color CrystalScan 1024NI

■ 124-Key AnyKey Keyboard

25MHz 486SX Intel Processor

Desktop Case (Tower Upgrade)

7 16-Bit ISA Slots. 2 on VL-Bus

MS-DOS 6, Diags, Windows & Mouse

MS Multimedia Works, CD-ROM Edition

NOMAD 425SXL

Backlit 10" VGA Screen, 64 Gray Scale

Intel Pentium Technology Ready

Windows Accelerator w/1MB DRAM

8MB RAM, 64K Cache

Local Bus IDE Interface

3.5" Diskette Drive

CD-ROM Drive

on VL-Bus

\$2495

4MB RAM

3.5" Diskette Drive

■ 1 Parallel / 1 Serial Port

MS-DOS and Windows

MS Works for Windows

\$1995

120MB IDE Hard Drive

Simultaneous Video with 1MB

Size 8.5" x 11" x 1.8." 5.6 Lbs.

6-Hr. NiCad Battery & AC Pack

■ 79-Key Keyboard & FieldMouse

\$1495

4DX-33

- 33MHz 486DX Intel Processor
- 8MB RAM, 64K Cache
- 5.25" & 3.5" Diskette Drives
- 212MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- Windows Accelerated Video w/ 1MB DRAM
- 14" Color CrystalScan 1024NI
- Mini Desktop Case
- 5 16-Bit ISA Slots
- 124-Key AnyKey Keyboard
- MS-DOS 6, Diags, Windows & Mouse
- MS Works for Windows 2.0

\$1895

4DX2-66V

- 66MHz 486DX2 Intel Processor
- 16MB RAM, 256K Cache
- 3.5" Diskette Drive
- CD-ROM Drive
- 340MB 13ms IDE Hard Drive
- Local Bus IDE Interface
- Intel Pentium Technology Ready
- ATI Ultra Pro Video w IMB VRAM on VL-Bus
- 15" Color CrystalScan 1572FS
- Desktop Case (Tower Upgrade)
- 7 16-Bit ISA Slots, 2 on VL-Bus
- 124-Key AnyKey Keyboard
- MS-DOS 6, Diags, Windows & Mouse
- Choice of Application Software

\$2995

NOMAD 450DXL

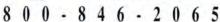
- 50MHz 486DX2 Intel Processor
- 3.5" Diskette Drive
- Backlit 10" VGA Screen, 64 Gray Scale
- Simultaneous Video with 1MB
- Size 8.5" x 11" x 1.8," 5.6 Lbs.
- 6-Hr. NiCad Battery & AC Pack
- 1 Parallel / 1 Serial Port
- 79-Key Keyboard & MS Ballpoint
- MS-DOS, Windows & Works for Windows

\$2495

(With 4MB RAM and 120MB Hard Drive)

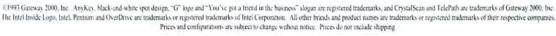
(With 8MB RAM and 200MB Hard Drive)

All hard drive sizes are manufacturer's specified capacities. Microsoft MS-DOS 6 can increase hard drive capacity through software compression.



610 Gateway Drive • P.O.Box 2000 • North Sioux City, SD 57049-2000 • 605-232-2000 • Fax 605-232-2023 Sales Hours: 7am-10pm Weekdays, 9am-4pm Saturdays (CT)





Contenda and WinBook Notes: Powerful, Affordable Lightweights

The ideal mobile computer would require no compromises: It would be lightweight and reasonably priced without sacrificing CPU power, screen brightness, and a comfortable keyboard. Today it's hard not to make a few compromises, but two new lightweights from Zeos Int'l and Micro Electronics strike an attractive balance—at prices that tip the scales in their favor.

The \$1495 Zeos Contenda is a 3.9-pound subnotebook, but don't let its weight fool you. This 9.7-by-6.1-by-1.8-inch machine is sleek and powerful. The product beats competing subnotebooks, namely the Gateway 2000 HandBook and the pricier Dell 320SLi, in two key areas: CPU power and dis-

Contenda

This boxy 3.9-pound subnotebook with 386SL processor power features a backlit VGA display and a comfortable keyboard.

Zeos Int'l 800/554-5220, 612/633-4591, 612/633-1325 (fax) List price: \$1495 Reader service no. 640

WinBook

At 5.4 pounds, this notebook offers the features and storage found in higher-priced units, plus one of the best embedded trackballs around.

Micro Electronics 800/468-2162 List price: \$1699 Reader service no. 641 play. The Contenda's powersaving Intel 25-MHz 386SL processor is more powerful than the HandBook's Chips and Technologies 286-class processor and the 320SLi's Intel 20-MHz 386SL chip. Its 7½-inch, 64-gray-scale LCD screen is the

only backlit VGA display of the three. So it's brighter and easier to read, particularly in lowlight situations.

Big Enough to Type

Can you type on it? Yes. The 80-key keyboard has a solid feel, with alphanumeric keys that are slightly, but not noticeably, smaller than the keys on your desktop system and offer a full 3mm key travel. To save space, Zeos reduced the size of the <Shift>, <Enter>, and function keys, but this keyboard should be adequate for all but the largest hands. The only

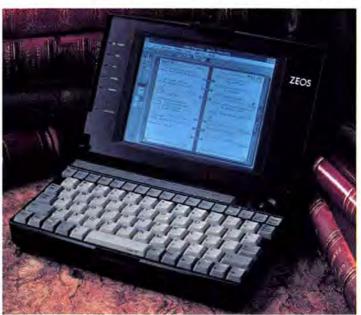
compromise is the use of a horizontal cursor key arrangement instead of the standard inverted T. The trackball, though minuscule, proved quite usable.

The Contenda has a nickel-metal-hydride battery that will power the system for up to 4 hours, according to the vendor, although some of our staff complained that it ran only 1½ hours in real use. The system's standard configuration includes 2MB of RAM upgradable to 10MB, and an 80MB hard drive. It also has an unusually small, light AC adapter. The Contenda can take an internal fax-modem and connections for an external floppy drive and a VGA monitor. It also has one serial and one parallel port.

A Winning NoteBook

The Micro Electronics Win-Book has achieved a new balance in weight and performance 10-inch, backlit, 64-shade grayscale VGA LCD screen.

But what Windows users will appreciate most is the oversize 16mm trackball located beneath the 85-key keyboard—very similar to the Apple Power-Book's keyboard arrangement.



THE \$1495 ZEOS CONTENDA is a 3.9-pound subnotebook with a power-saving Intel 25-MHz 386SL processor and a 7½-inch backlit VGA screen.

and should be of particular interest to *Windows* users. At only 5.4 pounds, the WinBook is billed as a notebook, but it makes its peers look like candidates for a weight-loss program.

This \$1699 system measures 11 inches wide by 8% inches long by 1% inches deep and is cheaper than many notebooks that offer fewer features and less storage. Run by the powersaving Cyrix 25-MHz 486SLC processor, the WinBook system includes 4MB of RAM that's expandable to 8MB, and a roomy 120MB hard drive that's expandable to 250MB. The WinBook offers an easy-to-read

The large trackball buttons are located just below and are spacious. The alphanumeric keys are standard size and feel good.

The system also addresses a power management issue for Windows users by providing a Motorola chip set that helps the WinBook's nickel-metal-hydride battery run for almost 4 hours, according to the vendor.

The notebook offers six I/O options for peripherals, including a PCMCIA 2.0 slot and a connector for an external VGA monitor. It also sports a 2400/9600-bps fax-modem and an internal 1.44MB floppy drive.

-Laurianne McLaughlin

CompuAdd 450SLC2: Bargain 486 Power

or those seeking 486 performance without the 486 price, CompuAdd's low-profile 450SLC2 desktop system offers a new choice: IBM's new clock doubler 486SLC2-50 processor. This processor performs on a par with Intel's 33-MHz 486DX, according to PC World Test Center lab tests, and the system is competitively priced at \$1695.

The IBM 486SLC2-50 runs at 50 MHz internally and 25

CompuAdd 450SLC2

This compact desktop uses IBM's new clock doubler processor, the 486SLC2-50, and yields 486DX-33 performance at a bargain price.

CompuAdd Computer Corp. 800/456-3116, 512/250-1489 List price: \$1695

Reader service no. 642

MHz externally. The chip features a 16K on-board cache, double the amount found on Intel's 486SX and DX chips. This large cache improves performance, especially with Windows applications.

Put through its paces at the PC World Test Center, the CompuAdd 450SLC2 was clearly faster than 486SX-25 systems. Among a range of 486DX-33 systems, it placed close to the bottom on Freelance Graphics and Excel tests and finished in the middle of the pack on Paradox and Word for Windows tests.

The IBM-built motherboard integrates components to save system space. For example, a Western Digital 90C31 video accelerator and 1MB of video RAM offer 1024 by 768 resolution with up to 256 colors and a 72-Hz vertical refresh rate.

To save space, both floppy drives are packed into a single



SLIM LOOK, SLIM PRICE: CompuAdd's \$1695 450SLC2 features IBM's new clock doubler 486SLC2-50 processor.

half-height 5½-inch bay, leaving another externally accessible bay for a 3½-inch device. In addition, the system offers one internal drive bay for 3½-inch de-

vices, five available expansion slots, 4MB of RAM expandable to 20MB, and a 14-inch interlaced super-VGA monitor.

-Laurianne McLaughlin

Recordable CD ROM Drive Sets Price Low

ometimes numbers really do tell the whole story. Case in point: Pinnacle Micro's new CD ROM recorders. Like other write-once CD ROM drives, Pinnacle's records up to 680MB of regular data, or 74 minutes of uncompressed sound, onto 5%-inch compact disks. The performance of the Pinnacle drive is acceptable; it will write a 63minute CD in slightly less than 1 hour, and the 300ms average seek time and 154-kilobytesper-second transfer rate meet the demands of multimedia. Where the Pinnacle stands out is on price. At \$4195, the RCD-

202 blows a hole in the CD ROM price floor; these devices have typically sold for \$8000 and more.

Pinnacle's timing couldn't be better. Analysts expect 1.5 million CD ROM drives to be sold this year, and the major PC vendors now offer systems with them as standard equipment. With a recordable CD ROM device, corporate developers can master complex interactive presentations or simple catalog databases that can be updated easily—by issuing a new disk—and shared among employees and customers. There's no need to fuss over compatibility issues;

the RCD-202 can write disks using virtually every audio, video, mixed media, and data standard available, including Orange, Red, and Yellow book.

The generous storage capacity of the compact disks also makes CD ROM a logical choice for long-term data archiving. Because they're not rewritable, however, regular backups are still better left to other media, such as tape.

For all the power packed into the drive, the RCD-202 occupies surprisingly little space. The external model is roughly 2 by 10 by 10 inches and weighs less than 7 pounds. There's also an internal, halfheight version of the drive (the RCD-200) that sells for \$4095. Both include a one-year parts and limited labor warranty.

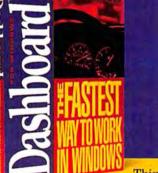
-Richard Melville

RCD-202, RCD-200

Cut your own CDs with these low-cost recordable drives for the PC.

Pinnacle Micro 800/553-7070, 714/727-1913 (fax) List price: RCD-202 \$4195, RCD-200 \$4095 Reader service no. 643





DASHBOARD?IT'S PRETTY FAST.

Think about it. No one would actually get speed-happy over a push-button utility panel for Windows ... Would they? Well, Dashboard does have some lightning fast

1-800-554-1305 Ext. 603W

For more information or to order Dashboard, call now! And just for fun, every 50th caller gets Dashboard FREE!* features. Like extended virtual screens that let you create, save and switch between up to 9 different full-screen views in a flash. Quick launch icons that launch your favorite applications with one click. And the "fuel" gauge with warning lights to instantly monitor your computer's memory, resources, and more.

Sure, it's got plenty of speedy features. But is that any reason to go crazy for the fastest way to work

in Windows? Maybe you can ask Mario as you blow by.

HEWLETT Fax inquiries 408-720-3560. © 1993 Hewlett-Packard. Dashboard and Dashboard for Windows are trademarks of Hewlett-Packard Company. Microsoft Windows is a registered trademark of Microsoft Corp. *Offer ends October 31, 1993.

Packard Bell's New 486 Fleet Comes Complete With Navigator

ith the launching of a new line of 486 desktop and minitower systems, Packard Bell is enticing firsttime PC purchasers and power users alike with the introduction of a range of products that feature performance, expandability, and ease of use.

Those hopping on board for

Packard Bell's Navigator, a selfhelp software tool that comes preloaded and employs simple menus and tutorials to help familiarize novices with their PC and with various bundled applications, including Microsoft's DOS 5.0, Windows 3.1, Works for Windows, and Money. Navigator, which sits on top of Windows, also offers a simple password protection option for applications, and point-and-click Packard Bell service-and-support information.

Packard Bell hasn't forgotten you. System options are many; choose from among 68 configurations with processors ranging from a 25-MHz 486SX to a 66-

the first time will appreciate

Power users: Rest assured

New 486 Systems

Navigator and Power Pack make for a smoother, speedier ride that will suit novices and veterans alike.

Packard Bell 818/886-9998, 818/594-8493 (fax) List price: \$1099 to \$3999 Reader service no. 644

MHz 486DX2. Case options include a four-slot, four-bay desktop; a small-profile desktop with three slots and three bays; and a minitower with five slots and five bays. But what should really attract performance hounds is Power Pack, a full complement of new features including such enhancements as Packard Bell's proprietary local bus video, which has a graphics accelerator on the controller chip. Also, processors are housed in a ZIF socket that supports an Over-Drive or Pentium-class Over-Drive for DX2 processor. You can expand the external cache up to 512K, so should your system go Pentium, you'll have the cache to meet your processor's needs.

The systems cost between \$1099 and \$3999. In all, ten software packages come with each. Systems with modems have a Prodigy start-up kit; faxmodem-equipped systems include both Prodigy and WinFax Lite. The systems are covered by a one-year limited warranty that includes on-site service. Packard Bell offers 24-hour, seven-days-a-week live tech support, and automated support that lets users request answers from a menu of the most commonly asked questions.

-Richard Melville



PACKARD BELL'S NAVIGATOR is a self-help program for novices.

Tiny Hard Drives Boost Storage Capacity

axtor and MiniStor Peripherals are among the first hard drive manufacturers to roll out 1.8-inch drives for PCMCIA Type III card slots. Designed for an upcoming generation of mobile computers, the minidrives are ideal as primary storage devices or as high-capacity removable media for office and portable use.

Among the new drives, Maxtor's MXL-105-III has the highest capacity, with 105MB of storage. Constructed to withstand the rigors of the road, the Maxtor can take an operating shock of 100 g's and a nonoperating shock of 300 g's, according to the company. In lay terms, you could probably drop a notebook (with the MXL-105-III inside a PC card slot) from your waist to a carpeted floor without damaging the drive.

MiniStor's MiniPort series includes a new 42MB model that joins the company's 64MB drive for Type III slots. A slightly larger 85MB is available for custom PCMCIA slots. In addition to higher storage capacities, the new drives offer improved shock resistance, MiniStor says. An on-board sensor detects jolts of up to 200 g's and postpones write commands until the system is stable-good for saving a file on a bumpy flight.

The Maxtor and MiniStor drives are mounted on PC cards and exchange data with the system via a standard 68-pin PCM-CIA 2.0 interface. Both will fit in Type III slots, which have more headroom for thicker, 10.5mm PC cards.

MiniStor officials expect their 85MB MiniPort to list for about \$600; the 42MB model will cost

approximately \$475. Pricing for Maxtor's MXL-105-III wasn't available at press time.

-Jeff Bertolucci

MXL-105-III, MiniPort 42/85

New PC card hard drives bring high capacity and removable storage to the tiniest of portable PCs.

Maxtor Corp. 408/432-1700, 408/432-4510 (fax) List price: not set Reader service no. 645

MiniStor Peripherals Corp. 408/943-0165, 408/434-0784 (fax) List price: 85MB model \$600, 42MB model \$475 Reader service no. 646

Windows at your fingertips.

WinBook, the first notebook computer designed specifically for Windows.

The new WinBook™ gives you all the power to run Windows. and the unique design to make it easier to use.

It features a built-in, centered trackball, which allows you to control cursor movements effortlessly with either thumbwithout having to lift a single finger off the keyboard.

And the WinBook comes with the power and speed needed to run Windows effectively. You get 4MB of memory, the new ultrafast 486 SLC/E 25-MHz processor and the Motorola chipset which provides eight power-saving features, even while running Windows.

The WinBook was engineered for Micro Electronics. a division of MEI/Micro Center, Inc. MEI is America's

leading direct source for computer accessories. Micro Center has been selling PCs for more than 14 years-longer than IBM or Compaq-with over 736,000 units sold. And with over 2.2 million satisfied customers nationwide, they 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.

Before you choose a notebook computer, look at the only one designed for Windows.

The WinBook from Micro Electronics

putting Windows at your fingertips.

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

- Fast-acting Hilachi LCD screen for no cursor loss.
- · 512k video RAM for simultaneous display.
- · Includes a 9600 band send/4800 band receive fax/2400 baud modem.
 - Industry standard PCMCIA 2.0 slot for future expandability.



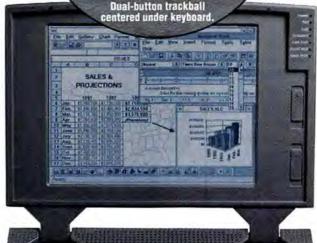
Eight Power-Saving Features

including sleep mode for all 1/0 ports HDD, and FDD to increase battery life



Docking Station

With the available docking station, your WinBook instantly becomes a full-function desktop computer Its two expansion slots allow you to add peripherals such as monitors, bard drives, CD-ROMs or an extended keyboard. And It's Just \$399!





Longer Battery Life

3.5 floppy disk drive

The WinBook features NiMH 2300 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.

Warranty

· 45-day unconditional money-back warranty.

PCMCIA 2.0 slot

- 24 bour burn in trotection.
- · One year limited warranty on parts and labor.

· 72-bour service turnaround guarantee

. Toll-free technical support for the life of the computer.

Payment Options

Visa, MasterCard, Discover, personal checks, COD's with cashiers check and Purchase Orders with approval.

Prices do not include applicable taxes, bandling or shipping charges. Prices and specifications subject to change without notice.

©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 properly of their respective corporations.

Specifications

Size/Weight • 11" x 8 3/4" x 1 3/4" • 5.4 lbs with battery

Pointing Device

16mm Alps dual-action, Microsoft compatible internal trackball

- A hours under normal usage
 Sanyo NiMH (no memory effect)
 2300 MA with gold-plated contacts
 Worldwide auto-sensing AC adapter
 Ouick 2-hour recharge
- Power Management

 8 power-saving features

Processor & Memory • 486 SLC/E-25 CPU

- 1 MB ROM for Ami BIOS
- Motorola chipset & Cirrus VGA 6420
 1k Internal Cache

- One built-in 1,44 MB 3.5" floppy drive
- Internal 120 MB (15ms) hard drive
 250 MB (15ms) hard drive optiona

Software
Comes loaded with MS-DOS 5.0 and Microsoft Windows 3.1

- uspray
 Super-twisted 64 gray
 scale, 10° LCD with CCFT-backlit
 640 x 480 VGA resolution for LCD and
 1024 x 768 for external monitor with
- 512k simultaneous display
- Adjustable contrast and brightness
 Visible LED indicator on cover-down

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

Modem
• Fax-9600 baud send/4800 baud receive/2400 haud modern

I/O Ports

- PCMCIA 2.0 slot
- · Serial: 9-pin connector
- Parallel port Video: 15-pin connector for CRT

160-pin docking station PS/2 mouse interface/keyboard interface

- 250 MB (15ms) hard drive

• 486 SLC E 25 MHz

- \$1499 • 120 MB (15ms) HDD • 80 MB
- (15ms) HDD
- · Fax modem

No-risk, 45-day unconditional money-back guarantee.

Micro Electronics, a division of MEI/Micro Center, Inc. • 1160 Steelwood Rd • Columbus, OH 43212 • Fax: 1-800-448-0308 • 8am-9pm EST, Monday through Friday • 9am-4pm EST Saturday

Circle 165 on reader service card

The WinBook for only

Adobe Photoshop Provides Extraordinary Image Editing

dobe Photoshop 2.5 for Windows is the latest and the greatest of the Macintosh design programs to migrate to the PC. It offers unequaled selection tools, precise masking and image editing controls, professional-quality print options, and an extremely flexible interface. The result is the most intuitive, enjoyable, and capable image editing package for the Windows environment.

Adobe Photoshop 2.5 for Windows' unbeatable selection tools should be considered essential equipment for retouching scanned images. In addition to the customary lasso and magic wand tools, which are used to select free-form and similarly colored areas, respectively, the program offers a Paths palette for selecting areas by drawing precise Bézier outlines. You can even edit a selection outline after the fact and save multiple outlines along with the image file. As a result, you can select any image-no matter how complicated-and return to that selection at any point in the future. You need an artist's touch to master the Paths palette, but once you do, you'll never go back.

Adobe Photoshop 2.5 for Windows

Macintosh image editor packs unrivaled retouching and printing capabilities into straightforward Windows interface.

Adobe Systems Inc. 800/833-6687, 415/961-4400 List price: \$895 Reader service no. 647 If your scan is off-color and you don't know how to fix it, you can instruct Adobe Photoshop to automatically generate a collection of hue and brightness adjustments.

Color Correct

Reminiscent of the Assist mode in Caere's *Image Assistant*, the *Photoshop* function lets you ex-

periment by selecting from thumbnail previews, rather than mucking about with technically named check boxes and obscure slider bars. For the novice, it's a perfect introduction to color correction theory—one that lets you work as you learn.

Like Aldus's Photostyler, Photoshop lets you change a scan's focus by applying filters to generalized areas or by using special drawing tools. Two new features, dodge and burn, let you light-

en and darken portions. You can refine your actions by adjusting the highlights, midtones, or shadows. You can also change the exposure of either tool to intensify or diminish its effect.

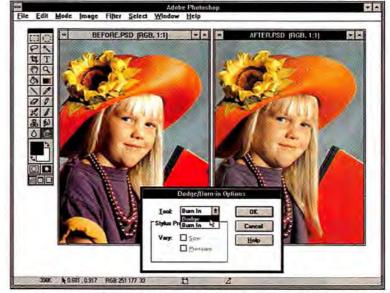
Negative Creation

If your interests run more toward creating images from scratch, *Photoshop* provides more brush options than any bit-map editor this side of Fractal Design's *Painter*. You can customize the shape of a brush tip, fade its edges to create soft glows and shadows, define the opacity of a brush stroke, and

specify which colors will show through from the original image and how they're affected. Furthermore, brushes influence every drawing tool, including dodge and burn, and they're fully compatible with pressuresensitive tablets.

If they gave out an award for the most print capabilities, *Photoshop* would win hands down. laying out a two-color newsletter, you can enhance the richness and depth of your images through the use of duotones.

Any list of *Photoshop*'s capabilities is bound to leave out something. Suffice it to say that every option you've admired in a competing program probably can be found in *Photoshop* and feels more at home there. This



ADOBE PHOTOSHOP 2.5 FOR WINDOWS offers excellent selection tools, exact masking and image editing controls, a variety of sophisticated print options, and a powerful yet easy-to-use Windows interface.

Most image editors are satisfied with outputting CMYK color separations. *Photoshop* goes several steps further, offering support for an unprecedented five major color standards, including America's Pantone, England's Focoltone, Japan's Toyo, the newspaper standard ANPA, and the DTP-specific Trumatch.

The program also supports the printing of duotones, tritones, and quadtones, which extend the tonal range of blackand-white photographs by overprinting two, three, and four inks. The technique may seem a tad esoteric, but even if you're quality comes at a price—\$895, \$100 more than high-priced editors, including *Photostyler* and *Ventura Software PicturePro*, and nearly five times the price of midrange programs such as ZSoft's \$199 *PhotoFinish*—but you get what you pay for.

Now what remains to be seen is whether *Photoshop*, in topping off the recent migration of heavy Macintosh hitters like *QuarkXPress*, *Adobe Illustrator*, and *Aldus FreeHand*, will manage once and for all to legitimize the *Windows* platform as a viable design standard.

-Deke McClelland

Maps&Data: Charting a Better Presentation

apInfo's Maps@Data is designed to enable the average business user to turn database and spreadsheet data containing geographical information, such as customer addresses, into high-quality maps useful for strategic planning and presentations.

This \$395 Windows product is relatively inexpensive and easy to use: Traditional mapping programs with the data analysis and presentation capabilities of Maps@Data have included high-end features that drove prices into the \$700 to \$1000 range. Lower-priced mapping programs are designed for navigation; they generate directions, not presentation graphics.

Maps@Data employs dropdown menus and dialog boxes and prompts you through the map-making process. For example, you can create a map of proposed expansion sites for a hypothetical chain of stores in Massachusetts in about five mouse clicks. First you'd import a database of potential sites into Maps@Data. Once that's imported, the program identifies each site on a state map. To highlight targeted demographics near each site, say families

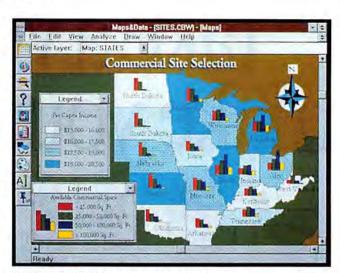
Maps&Data

erately priced, easy-to-use Windows program enables you to integrate business data with maps for better presentations.

MapInfo Corp. 800/327-8627, 518/274-6000, 518/274-6066 (fax) List price: \$395 Reader service no. 648 earning more than \$50,000, you can import household income data from the program's 1990 U.S. census database. The software shows household income by county, using a color range.

In addition to U.S. demographic information on variables such as population, age, and buying power, the software includes some European and global data, including inflation rates, unemployment rates, and land area statistics. The product also provides global maps with country boundaries and capitals, and United States and state maps. More detailed maps show U.S. counties, cities, highways, and ZIP code areas.

Graphic and design features let you enhance maps with color ranges, fill patterns, pie and bar charts, and 100 symbols.



MAPS&DATA GIVES YOU AN EASY WAY to visualize, analyze, and present data. The program includes detailed maps and statistical data.

Maps&Data can import database and spreadsheet files from popular programs such as dBASE, 1-2-3, and Excel. With its combination of statistics and display power, Maps&Data offers a way to broaden and bolster presentations. Ross Perot would love it.

-Laurianne McLaughlin

Windows Development Easier With Visual C++

oftware developers struggling with the steep learning curve of C++ and Windows programming will get a gigantic productivity boost from Microsoft's Visual C++ 1.0 applications development system for Windows. This fully integrated Windows-based environment incorporates graphical tools to speed the development process. With Visual C++, you get virtually all the components of a Windows application.

A key productivity assist comes from the Visual Work-Bench, from which you can edit, build, debug, and browse code. You can launch powerful visual tools included with the package from here to build resources such as menus, dialogs, and icons; map resources to application code; and generate skeleton applications—all with little code entry.

Also new within Visual C++ is Microsoft Foundation Class (MFC) Library 2.0. It includes documents and views, tool bar and status bar classes, Object Linking and Embedding (OLE) 1.0 classes, dialog data exchange and validation (which helps validate data values entered into a dialog box), context-sensitive help, and support for Visual Basic custom controls.

The foundation classes provide the *C++* API for *Windows* and the canned functionality that can bring the power of thousands of lines of code into your programs, thus significantly reducing the amount of code that you will have to write.

Microsoft Visual C++ 1.0

opment system for Windows
with enhanced classes and
visual tools in an integrated
Windows-based environment.

Microsoft Corp. 800/992-3675, 206/882-8080 List price: Standard Edition \$199, Professional Edition \$499

Reader service no. 649

The Standard Edition of *Visual C++* is \$199, and *QuickC for Windows* users can upgrade for \$79. The Professional Edition is \$499, and C and C++ 7.0 users can upgrade for \$139.

-Rick Knoblaugh

We figured it would take a Wizard to make your job easier.



The real magic of Microsoft* Excel is that all of its innovative tools have been

designed to do just one thing: make

your everyday work easier.

In order to achieve this goal, our product development team spends countless hours studying the way you work with your spreadsheet. Listening to your needs. And even following your suggestions.

For example, we discovered that with your current spreadsheet it's often difficult to make the kind of charts you want. So we designed a tool called the ChartWizard. It's so easy to use, it actually helps you create a number of smart-looking charts on-screen, step-by-step.

What about the things you have to do over and over again? The things that are time-consuming and tedious? Like filling in dates. Adding up numbers? And formatting worksheets?

Well, with Autofill, Autosum, and Autoformat, you can now do all these everyday tasks with just a few clicks of the mouse. Or as fast as you can say "one, two, three."

All of which has helped more than a million people who use Lotus 1-2-3 make the switch to Microsoft Excel:

the spreadsheet for Windows."

And finally, we've not only made Microsoft Excel for Windows easier to

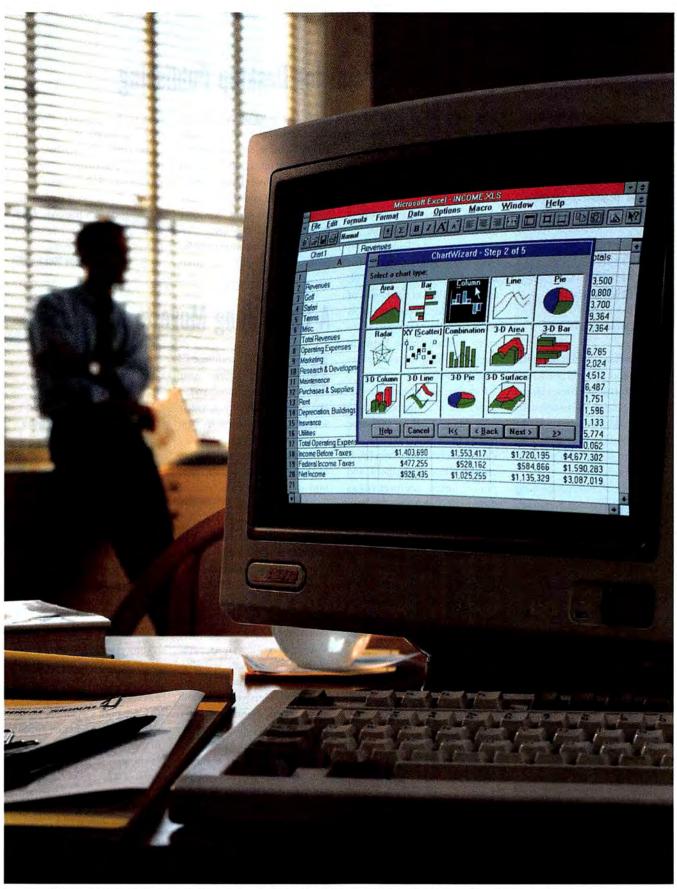
use, we've also made it easier to get. Right now, you can easilv switch for



as little as \$129. Just visit your nearest reseller, or give us a call at (800) 426-9400, Department HY8.

Then you can see for yourself why the most innovative spreadsheet actually feels a little like magic.

Making it easier



With Microsoft Excel, making a great-looking chart has never been easier. That's because the ChartWizard tool helps you create smart-looking charts, step-by-step.

PagePlus 2.0: A New Low Price Point for Desktop Publishing

PagePlus 2.0 for Windows

windows. This easy-touse desktop publisher offers many high-end features, such as color publishing capabilities, at a rock-bottom price.

Serif Inc. 800/697-3743, 603/889-8650, 603/889-1127 (fax) List price: \$59.95 Reader service no. 650

he bottom just fell out of the low-end desktop publishing market. Serif's latest release, PagePlus 2.0 for Windows, costs \$59.95, addresses many of the criticisms of the last version, and offers features found in programs costing much more.

To make desktop publishing easy, Serif has added preformatted document templates and style sheet and master page capabilities. *PagePlus* maintains its *PageMaker*-like interface, which features a pasteup-board work area and toolboxes.

A text frames feature uses column blinds to control where text starts and ends. To create room for a graphic element, you drag the blind up. After importing the element, the text will flow around it. *PagePlus* also wraps text around irregularly shaped objects and now offers full text and image rotation.

An improved ChangeBar includes new graphics tools that let you adjust line color, fill color, and fill tint (intensity of color) quickly. New text tools let you modify text color, alignment, leading (space between lines), and kerning (space between letters).

PagePlus has production-oriented color features, starting with Pantone colors, the same palette used by commercial and Pantone-licensed desktop printers. (Monitors, applications, and printers often interpret colors differently—choosing a Pantone color ensures the color you choose is the color printed.)

PagePlus 2.0 for Windows supports two-color publishing, which lets you inexpensively add, say, a bright accent color to a black-and-white newsletter. Additionally, the software can create four-color process separations. An image colorize feature enables you to change the tint of a colored object, allowing you to place a light-colored graphic behind text. Another feature not found in many low-cost products is a table editor.

PagePlus isn't a substitute for professional publishing prod-

ucts such as *Ventura Publisher* and *PageMaker*, nor does it include clip art or scalable fonts (these are available in separate modules for \$19.95 each).

Still, if you need basic page layout and color features, *Page-Plus 2.0 for Windows* offers power at a painless price.

-Laurianne McLaughlin

A Compelling Move to Multimedia

on't let the multimedia bugaboo frighten you. Asymetrix's *Compel*, a \$295 *Windows* program, brings video, sound, and animation to your on-screen presentations.

Compel hides the complexity of weaving multiple file types into a coherent presentation, and it's easy to use, thanks to a well-conceived design that's a surprise for a 1.0 release. Built around the classic slide metaphor used by programs like Lotus's Freelance, Microsoft's PowerPoint, and Aldus's Persuasion, Compel has plenty of familiar tools, including slide sorter and outline views, capable text management, and plenty of templates and clip art. Compel also lets you link, edit, and control sound and video files and create interactive hyperlinked presentations.

Compel works with a variety of sound and video files, including WAV, MIDI, AVI, and DVI. You incorporate sound, video, and animation elements in a presentation by linking them into slides and setting them to play or halt upon a specific action (entering a slide, clicking a mouse, and so on). This capability goes well beyond basic OLE support—which Compel

Compel 1.0

sound, video, and animation together with this easy-to-use presentation program.

Asymetrix Corp. 800/448-6543, 206/637-1504 (fax) List price: \$295 Reader service no. 651

also offers—letting you coordinate presentation resources.

Asymetrix uses the right mouse button to call up context-sensitive menus for selected objects, à la *Quattro Pro* and *Excel*. In addition, the program's icon tool bar takes some of the guesswork out of deciphering the program's symbols: A description of its function appears in the lower left corner whenever the mouse passes over it on the tool bar.

While other presentation packages focus on outputs to slides, transparencies, and paper, *Compel* concentrates on making PC-based presentations work and provides a run-time engine so that you can play *Compel* presentations without installing the program.

-Michael Desmond



DIRT-CHEAP DESKTOP PUBLISHING: PagePius 2.0 for Windows costs just \$59.95 but offers features found in programs costing much more. New text tools let you modify text color, alignment, and line spacing.

PackRat 5.0: This May Be the PIM You Use

with PackRat 5.0, Polaris Software has turned its erstwhile personal information manager (PIM) into a desktop shell that uses the file folder metaphor to let you organize your work and applications.

The enhancements are apparent as soon as you begin loading the program: A new installation process helps you harness Pack-Rat's massive feature set for your particular needs, with predefined work space setups tailored to specific professions, such as legal, medical/dental, sales/marketing, and MIS.

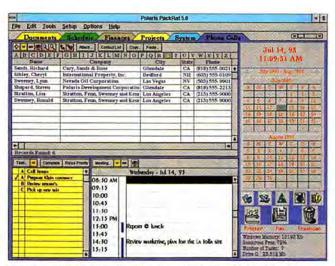
In PackRat 5.0, you use file folders to organize your work and access applications, creating a virtual desktop information center. You can define each folder and fill it with documents and applications to organize your jobs any way you want, be it by project, client, accounting month, or sales region. PackRat is as flexible as you are-you can keep your schedule in a folder by itself, all your spreadsheets in one place, or all your documents and spreadsheets for one project in the same place. There's no software limit to the number of folders you can place on your desktop. They can dis-

PackRat 5.0

mat and advanced application integration help this popular PIM fulfill its promise to be the hub of all the work that you do.

Polaris Software 800/722-5728, 619/592-7400, 619/592-7430 (fax) List price: \$395 Reader service no. 652 play as a whole stack, with the tabs oriented to the top of your screen or to the left side. Alternatively, you can hide the tabs and choose your folders from a list instead.

The fundamental strength of the \$395 PackRat 5.0 lies in its application handling capabilities. You can place application icons in a folder for instant access to the programs you use with that work. And even better, PackRat 5.0 uses Object Linking and Embedding (OLE) to place data files in folders as OLE clients. Because these files are objects unto themselves, you don't have to launch an application to view them, yet they maintain a relationship to their originating files, so you can stay up-to-date as changes occur. A network



A TYPICAL SCHEDULE FOLDER in PackRat 5.0 might include a calendar, a clock, system information, and a Gantt chart of appointments.

version of *PackRat 5.0* is scheduled to ship this summer.

PackRat has a reputation for being the mother of all PIMs. While the program's new interface and functionality stretch the definition of a PIM, they also make it far easier and more practical to use.

-Melissa R. Riofrio

askSam for Windows: The Friendly Power Tool

he askSam database program lets you search volumes of text and order unstructured data. Until now, all this power was reserved for users who could brave the product's idiosyncratic interface and cryptic command language.

Now in Windows, the \$395 product addresses these drawbacks with a friendly interface, a graphical report writer, and features designed to increase usability.

Perhaps the most significant improvement is the graphical query builder, which makes it easy to generate proximity, Boolean, and other complex searches. You pick options from a series of drop-down menus and dialog boxes that build the searches for you. Likewise, a

graphical menu- and mousedriven report writer enables you to sort, lay out, and print data without cryptic commands.

Though creating a database structure was never difficult with the DOS version of ask-Sam, the Windows version includes at least 20 templates that make it even easier.

For amending and appending databases, askSam for Windows includes full-blown word processing functions, including formatting, not available in its DOS counterpart. The Windows product can also import data in more formats, such as WordPerfect 5.x, dBASE, and RTE.

askSam for Windows is slower than the DOS version, and it doesn't contain any of the relational capabilities of the current

askSam for Windows

WINDOWS A friendly
Windows interface makes
this unique database manager and text-retrieval product
accessible and easier to use.

askSam Systems 800/800-1997, 904/584-6590, 904/584-7481 (fax) List price: \$395 Reader service no. 653

DOS product. Moreover, applications written for the DOS product will not run under the Windows version. Still, for the average computer user, trading power for ease of use is probably a sacrifice worth making.

-Randy Ross

LANtastic 5.0: More Features, Easier to Manage

hen it comes to features, power, and ease of use, Artisoft's LANtastic is widely regarded as the king of peer-to-peer LANs. A Best Buy in PC World in June 1992, LANtastic's latest release offers a host of innovative features for both users and administrators, including a network scrapbook for storing text, graphics and sound files, voice chat capabilities, and improved file security.

First the fun stuff. Artisoft has launched an impressive counterattack to Microsoft's Windows for Workgroups by adding some features you'll find in Microsoft's peer-to-peer LAN and a few you won't. LANtastic 5.0's network Scrapbook-similar to WFW's Clipbook-lets Windows users share text, graphics, and even sound files. Click on the Scrapbook icon, then copy and paste the contents into other Windows applications (sound files appear as icons). You can create additional Scrapbooks to store items relating to a specific project. For example, a Scrapbook for a presentation might contain text, charts, and spreadsheets pertaining to the project.

Ready for Voice

In addition to a Chat utility that lets Windows users exchange messages in real time, LANtastic 5.0's Voice Chat feature allows real-time voice conversations over the network. However, only Windows PCs with Artisoft's \$99 Sounding Board, an add-in sound card, can use the Voice Chat feature.

Voice Chat comes in handy for work-group tasks such as editing a business document stored in the network Scrapbook. Also, it's a convenient way to have in-office confer-



ARTISOFT'S LANTASTIC 5.0 includes a new Scrapbook feature that lets Windows users share text, graphics, and sound items across a network.

ence calls without tying up the phone lines. A pop-up message informs you when another user wants to chat. You click on the Chat window, select Call, then talk using the telephone handset that ships with each Sounding Board.

LANtastic 5.0 has two bonuses for users with sound boards: LAN Radio and voice error messaging. LAN Radio lets you plug a radio or CD player into any Artisoft Sounding Board on the network and broadcast news, information, or music on your choice of 100 channels. Voice error messaging lets LAN administrators record error or tutorial messages for usershelpful for guiding novices through a difficult software installation, for instance. (You can also download prerecorded messages from Artisoft's Artifacts BBS.)

200 More Users

LANtastic 5.0 supports up to 500 users, which is 200 more than the previous version. Because it lets administrators redi-

rect disk drive and printer connections, users can access drives and printers on non-LANtastic servers, such as those running Novell NetWare.

Powerful security enhancements let you set user access rights on a file-by-file basis. For instance, a shared directory on a workstation might contain both private and public files. Also, certain users may be granted read, write, and delete privileges, while others have read-only access.

Administrative Options

New ACL (Access Control List) groups give network chiefs an easier way to set up user privileges. Administrators can create access accounts for individual users, as well as for different departments in the organization, such as sales, shipping, or senior management.

LANtastic users with the new "O" (or "operator") rights can automatically receive notification of major events that can affect security or slow network performance, including access

violations and printer errors on remote servers. And network administrators can receive audit information on user log-ins and log-outs and on queuing and printing activity.

Pricing of LANtastic 5.0 varies. LANtastic Network Starter Kits, which include add-in network cards and version 5.0 software for two PCs, cost \$659 for the DOS version and \$759 for the Windows-DOS version. A 6-user license is \$1499, a 12-user \$2899 (both include

hardware and software). If you already own network cards, the software-only *LANtastic 5.0* for DOS costs \$119 for 1 user, \$659 for 6 users, \$1189 for 12 users, and \$2999 for 500 users. The software-only *Windows*-DOS version is \$139 for 1 user, \$779 for 6 users, \$1429 for 12 users, and \$3499 for 500 users.

Like the previous versions of LANtastic, version 5.0 includes built-in E-mail. With its innovative user features and improved management tools, LANtastic will likely retain the top spot among its peers.

-Jeff Bertolucci

LANtastic 5.0

Artisoft improves its peer-topeer LAN by adding a network scrapbook, voice capabilities, and easier administrative management tools.

Artisoft Inc. 800/846-9726, 602/293-8065 (fax) List price: \$119 to \$3499 Reader service no. 654

120 DAZZLING FONT FOR WINDOWS...

SERIF FONTPACK I



ontPack I is a professional collection of 120 new TrueType fonts from Serif. Every FontPack typeface is a foundry-quality, carefully hinted aeType font for maximum performance and or-sharp quality.

Specifically designed to work with all your Windows plications, FontPack I typefaces are fully scalable for e WYSIWYG display in your DTP, word processor, or readsheet – including PagePlus, Serif's award winning sktop Publisher.

With FontPack I you get a complete designer library handsome classics and decorative headlines for any ood or feel. Now you can pick the perfect typeface to ate a good impression in memos, reports, letters and all your other documents.

Microsoft TrueType is the

Microsoft TrueType is the standard font engine built into every copy of Windows, so MICROSOFT installation is a snap using the Windows COMPATIBLE Control Panel. FontPack I typefaces include

the full Windows character set, and support all the features of your Windows software. Best of all, they're fully compatible with every Windows supported printer from dot-matrix and ink-jet through to laser printers and imagesetters.

Whether you're adding to your existing fonts, or looking for your first TrueType font collection, these great typefaces will add a touch of class to all your publications.

24-HOUR TOLL-FREE HOTLINE **00-697-3743**

24-HOUR FAX ORDER LINE 800-869-8909

Great Software, Direct



Serif, Inc., • PO Box 803 Nashua NH 03061 • Tel: (603) 889-8650 Fax: (603) 889-1127
Serif Europe • PO Box 15 Nottingham NG7 2DA England • Tel: +44 602 421502 Fax: +44 602 701022
NOTE: Please add \$7 S&H (\$12 international). Checks and Money orders to SERIF, VISA, MasterCard and American Express. Official POs from Education, Government and Fortune 1000. BumperPack is PagePlus and all Publishing Packs. 10-User Pack is BumperPack with Site License for 10 users in one location. You need Windows 3.1 or higher. All Serif product names are trademarks of Serif, Inc. All other trademarks acknowledged. Like all Serif marketing materials, this ad was designed and color separated using PagePlus and FontPack.

Circle 225 on reader service card

Try FontPack Mor just \$19.95 in our Special Offer!

We're launching FontPack I, ArtPack I and TypePlus 2.0 as the lowest priced Windows add-ons. They are just \$19.95 each and work with all your Windows applications. It's possible because you're buying direct from the publisher – Serif gives you high-end products at entry level prices. Better still, get everything in our Bumper Pack for \$99.95 and save another \$20. (For education and larger groups you can get the BumperPack for 10 Users for \$249).

NEW! FontPack I is 120 (yes, 120!) TrueType classic and decorative typefaces.

NEW! TypePlus 2.0 for eye catching text effects. Type on an arc, circle, button or bezier curve.

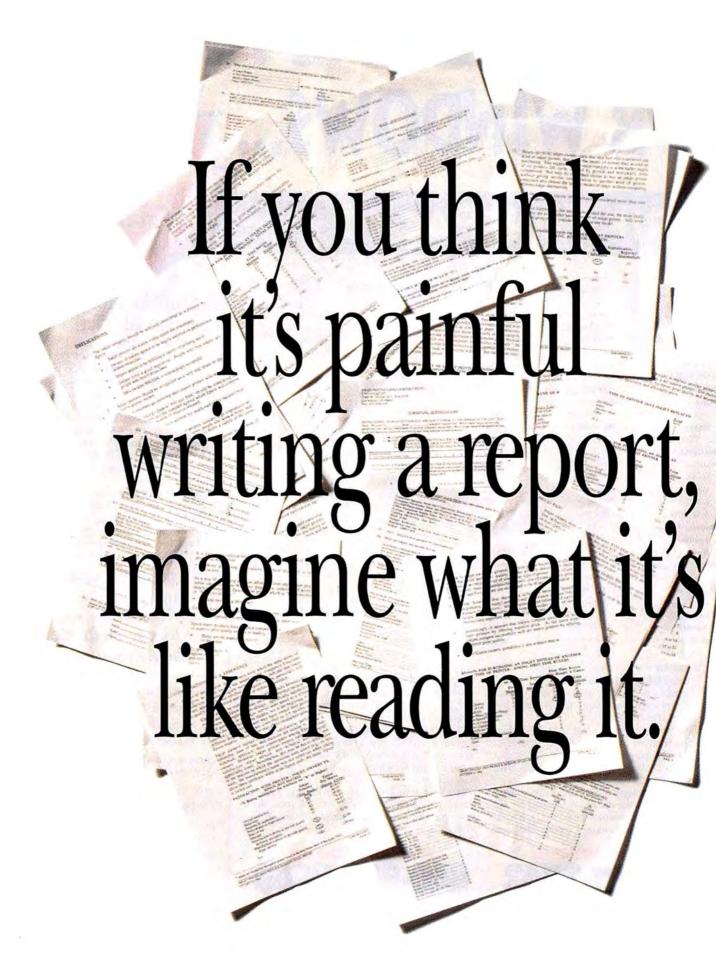
NEW! ArtPack I a professionally drawn collection of vector art with over 500 color images for superb results.

NEW! PagePlus 2.0 is the winner of the Windows User Award for "Best DTP software" (Did this ad!)

So call us Direct, or fax/mail the coupon today!

YES! Please rush me
☐ FontPack @ \$19.95
☐ TypePlus 2.0 @ \$19.95
☐ ArtPack @ \$19.95
PagePlus 2.0 @ \$59.95
BumperPack @ \$99.95
☐ 10-User Pack @ \$249
I enclose a total* of \$
Credit Card No
Exp. Date
Signature
Name
Company
Address
City
StateZip
Telephon()
Please return to: Serif, Inc. PO Box 803
Nashua NH 03061

Or Fax Toll-Free to: 800-869-8909



No matter what type of document you're writing, Epson® has something that could benefit you as well as your

readers. The Epson Color Scanner.

A tool that easily could've been named the Epson "Add A Picture and Some Interest To Your Documents" Machine.

The rationale behind using one is simple. People like pictures. In fact, probably more than words. And besides being pleasing to look at, pictures often communicate faster than words, which means your audience will grasp your message more quickly, too.

What's unique about Epson scanners is that they come with more than the prerequisite wires and cables. With our optional interface kit, you get a full version of the best software around: Micrografx® Picture Publisher® 3.1. Then we toss in a Caere® OmniPage® Direct OCR TryPack to help you scan in text. And whether you pick our 600C or 800C scanner, you get 24-bit single pass color

scanning with almost 17 million colors.

Epson also offers handy add-ons, like a transparency unit for scanning

slides, or an auto-document feeder to cut down on all of that time-consuming lid lifting. And, as always, we give a one year warranty. Not that you'll need it given the way we make things around here, but just so you know we're there if you need us.

So why not look into an Epson Color Scanner for your office? After all, it couldn't hurt to test one out. And besides, your clients would probably really appreciate it.

Quarterly Report

untiling of all follows and investment of the collections which has been executed and the collection of the collection o

while they work out an expense graph or the \$1 plan were not experienced to graph up the service and planters that \$2 do not 1, the read or a 10 th antique on among beings to the cold of the cold o

was to a finish produced by the control of the cont

And the first the distance or region with what the first copy has no common and see point or the co

Before.



After.

about scanners? Call 1-800-289-3776 and ask for representative 72 and we'll send you our free booklet.

Want to learn more

What You Should Know

EPSON











10000

s Natehook

Kingston DataCard

Kingston Technology's Data-Card lets Micro Channel users add disk storage and RAM inexpensively and uses only one expansion slot. The Data-Card is an add-in board with either an 85MB, a 127MB, or a 209MB 21/2-inch Winchester hard drive (16ms access time) with four SIMM sockets. The 16-bit version for PS/2s with a 286, 386SX, 386SLC, or 486-SLC processor holds up to 16MB of RAM; the 32-bit version for PS/2s with a 386DX or 486 CPU holds up to 64MB (four 16MB SIMMs). For IBM PS/2 systems, some of which have only three expansion slots, the DataCard multifunction board is a compact way to add system resources. The Data-Card is also compatible with Micro Channel systems from NCR, Olivetti, and Memorex-Telex. The DataCard costs \$545 (85MB drive), \$695 (127MB drive), or \$895 (209MB drive). Kingston Technology, 800/835-6575, 714/435-2600.

Reader service no. 655

Forecast for Excel

Forecast for Excel is a spreadsheet add-in for business planning previously available only for 1-2-3 and Symphony users. With Forecast, you can turn raw spreadsheet data into forecasts and analyses without complex statistical software. The program is useful for budget preparation, cash flow forecasts, and market analyses. Forecast uses three analytical techniques: time-series analysis, multiple regression, and statistical analysis. You can pick from several different models, including linear, exponential, hyperbolic or Scurve trends, and exponential smoothing. For additional accuracy and reliability. Forecast lets you make seasonal adjustments to your data. It offers spreadsheetlike menus for easy data importing and works with Excel's built-in publishing features to create presentations. Forecast for Excel works only with Excel

4.0. The program costs \$165. Intex Solutions, 617/449-6222, 617/444-2318 (fax).

Reader service no. 657

Flexibak Plus

Dysan Int'l now includes Flexibak Plus backup software with every box of ten 31/2inch or 54-inch floppy disks. This DOS backup utility allows full, incremental, and selective backups. It keeps a library of files, compares files since the last backup to floppies,

and lets you know if any files are missing from your hard drive-useful in tracking down accidentally deleted files. Flexibak Plus also offers file compression that shrinks files by a ratio of up to 20 to 1. The Flexibak Plus offer is good through June 30 or while supplies last. The high-density Dysan floppies cost \$12.99. Dysan Int'l, 800/422-3455, 408/945-4235 (fax).

Reader service no. 656

Epson Stylus 800

Over the past year, ink jet printers have quietly become the fastest-growing segment of the printer market, in large part because they deliver laser-quality text output for about half the price of low-end lasers. The Stylus 800 uses Epson's new ink jet technology, which the company claims delivers sharper resolution at a lower cost. The printer delivers 360-dpi resolution at speeds of up to 3 pages per minute, and operation at a quiet 45 to 47 decibels (about the same as most lasers). The Stylus 800 also provides an

adequate 100-sheet paper tray and seven internal fonts (four of

of 425 volts (versus 300 volts for the A300), as well as the capability to bring down your network during a power outage. Taking the insurance concept one step further, Tripp Lite's BC 400-in addition to providing 400 volts of backup pow-

Edited by Jeff Bertolucci



EPSON'S STYLUS 800 ink jet printer delivers 360-dpl resolution at speeds of up to 3 pages per minute. It comes with a 100-sheet paper tray and seven internal fonts (four scalable) and operates at a quiet 45 to 47 decibels.

them scalable), all at a list price of \$449. Epson America, 800/ 289-3776, 800/922-8911.

Reader service no. 658

Minuteman Alliance, Tripp Lite BC 400

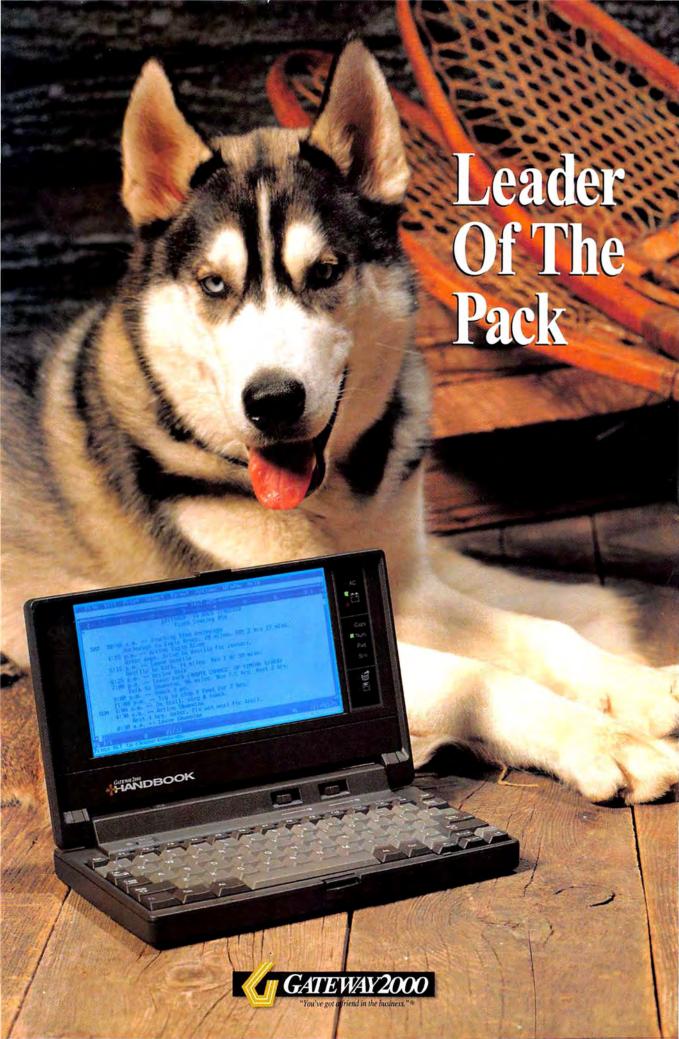
Lightning, power surges, blackouts: Any of these can trash a day's work-if not your entire system. Insurance for your PC comes in the form of uninterruptible power supplies (UPS) that power your system during blackouts and protect it from power surges. Minuteman's Alliance UPS series consists of the A300 and the network-ready A425. With both, you get backup protection in case of power failure, 2ms response time to power surges, and wall socket testing to detect outlets with bad grounding. The pricier A425 provides an extra 125 volts of backup protection for a total

er-carries \$25,000 of insurance coverage for the replacement or repair of connected equipment damaged by any surge, including direct lightning. The Minuteman Alliance A300 is \$159, the Alliance A425 \$259, and the Tripp Lite BC 400 \$219. Minuteman, 800/238-7272.

Reader service no. 725 Tripp Lite, 312/329-1601. Reader service no. 659

DataPerfect 2.3 for DOS

WordPerfect's latest version of its menu-driven database for DOS has an improved menu system, database diagnostic utilities, phone dialing capability, and improved mathematical, statistical, and financial analysis features. Quick Merge, a new report feature, lets you create WordPerfect 5.0 or 5.1 merge files with named fields for enhanced reporting. Bundled





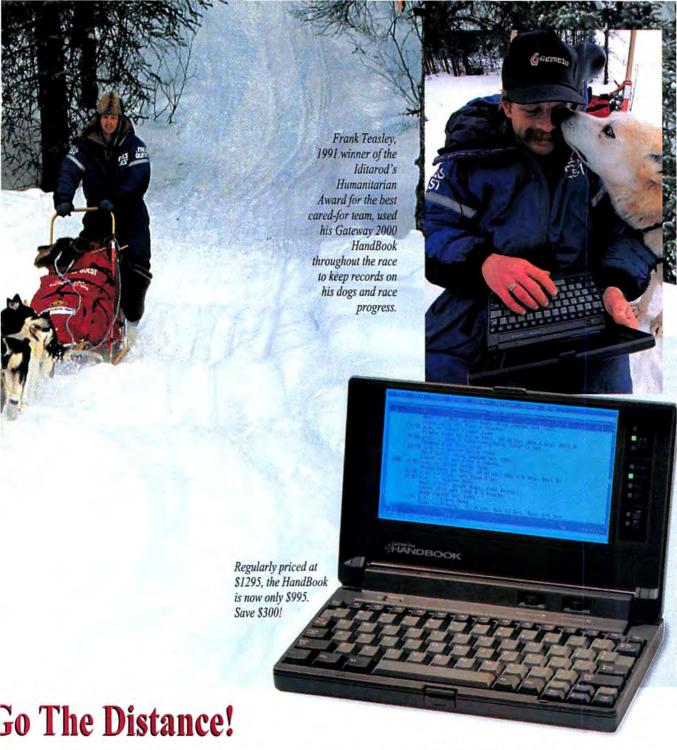
Gateway's HandBook Is The First Portable To (

On March 6, 1993, 68 men and women, 1,253 dogs and one portable computer left the starting line in the 21st running of the Iditarod dogsled marathon. Not all of the men, women and dogs made it through nearly 1,100 miles of blinding snow, howling wind, mountainous terrain and sub-zero temperatures – but the PC did!

It was the first time anyone ever took a portable all the way from Anchorage to Nome on a dogsled. Appropriately, the first portable PC to go the distance was the first product in an entirely new category of portables; the unique and innovative product that defined new standards for portable PCs: the HandBook, pioneered by Gateway 2000. At just 2.75 pounds, measuring

only 6 x 10 inches yet including a 40MB hard drive, a backlit, use-it-anywhere screen and comfortable keyboard, the HandBook was the only choice for Iditarod musher Frank Teasley.

"I've always wanted a way to carry my racing strategy with me and to record my progress during the race," said Frank. "But I can't afford any extra weight on the dogsled, and you don't find many electrical outlets on the trail. The HandBook easily fit in the dogsled, and I used it at checkpoints to review details of the trail ahead, information on my competition, and notes on my dogs." Because he couldn't recharge batteries on the trail, Frank ran his HandBook on AA batteries kept warm in his parka.



Frank said the HandBook's exclusive auto-resume feature was a big plus, too. Being able to open the HandBook and start working exactly where he left off made it effortless to use.

Although the dogs slept an average of 12 hours a day during the race, Frank was lucky to sleep 45 minutes daily. He was busy making straw beds, putting ointment on the dogs' feet, replacing their polar fleece booties, preparing their food, repairing harnesses and repacking while the dogs rested. "Sleep deprivation can be hazardous to a musher's ability to focus on details. The HandBook kept me on top of my schedule so I could concentrate on the dogs and they could concentrate on what they love best: the race."

Frank concluded, "There's not another computer small enough or powerful enough to come through for us the way the HandBook did."

It's a PC that's the perfect companion in even the most demanding situations, even if you never leave your office. Get the leader of the pack: Gateway 2000's HandBook!



The Perfect Companion!

The Gateway 2000 HandBook®

- Weight: 2.75 lbs. (includes battery)
- Dimensions: 5.9" x 9.75" x 1.4"
- AC adapter/charger measuring
- NiMH 2.3Ah battery; approximately
 4.5 hrs. battery life with power management
- Alkaline battery pack; (AA batteries not included)
- C & T processor, 286-class performance
- 1MB RAM, upgradeable to 3MB
- 40MB hard drive
- Backlit 7.6" double-scan 640 x 400 resolution screen
- 1 parallel and 1 serial port
- 78-key keyboard; 101-key emulation, inverted-T cursor pad
- Microsoft® MS-DOS® 5.0, Interlink and your choice of WordPerfect® for DOS 5.1 or Microsoft Works™ for DOS 2.0
- Serial download cable

\$995





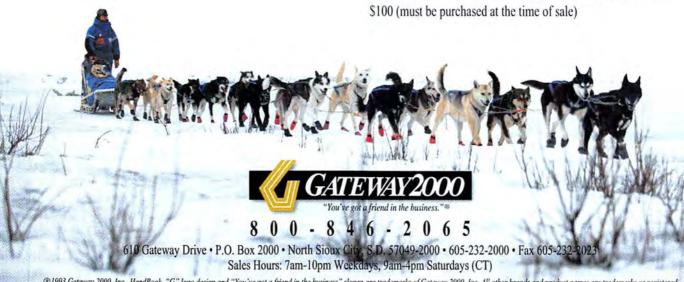


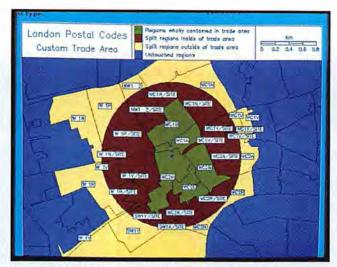




HandBook Options

- 2400bps data/9600bps send-and-receive fax/modem with software, \$165 Citizen PN48 portable printer, \$380
- Extra AC adapter, \$75 Extra 2.3Ah batteries (each), \$70
- RAM upgrade to 3MB, \$130 Combo unit (1.44MB 3.5" external floppy drive with 1 parallel and 1 serial port), \$265
- Extended VIP warranty (24-hour factory service turnaround), \$100 (must be purchased at the time of sale)





STRATEGIC MAPPING'S EUROSTAT EDITIONS make obtaining postal codes for European cities (London is shown), as well as detailed market and demographic information, a simple matter of point and click.

utilities include predesigned checkbook, bibliographic, invoicing, and billing databases, so you can load and run *Data-Perfect* without even needing to set up the databases first. *Data-Perfect 2.3* lists for \$495; \$129 for *WordPerfect* users. WordPerfect Corp., 800/451-5151.

Reader service no. 660

Searcher 3.0 for Windows, Searcher Professional 2.0

-WINDOWS▼ Looking for an inexpensive Windows file manager? New versions of Searcher and Searcher Professional will do everything your file manager does, and a bit more. Searcher 3.0 is a classic file and text finder, capable of locating a file by name, date, size, or text string. Searcher sleuths anywhere on your system, including all local and network drives, and reads most word processing, ASCII, and PKzip (version 1.x) files. Searcher Professional adds the capability to program your keyboard's function keys for quick access to common tasks. For example, you could link a function key to a Word for Windows macro that speeds text searches within the word processor. Searcher's Free Launch, a variation on Windows' Task Manager, lets you launch and terminate multiple applications with a single command. There's also a nifty file tree for graphical representation of your directory structure. Either product is worth a look if you're unsatisfied with your current file manager. Searcher 3.0 costs \$29.95 (plus \$2 shipping and handling); Searcher Pro 2.0 costs \$59.95 (plus \$4 shipping and handling) and includes a 60-day moneyback guarantee. Cognitronix, 619/549-8955.

Reader service no. 665

Strategic Mapping's Eurostat Editions

The elimination of European trade barriers has created an interesting opportunity for users of desktop mapping software. Strategic Mapping and the Statistical Office of the European Communities—Eurostat—have pooled resources to make population, birth, death, employment, income, and economic data available for the entire

European market. You can buy any of Strategic Mapping's three desktop mapping programs in the Eurostat edition: Atlas GIS for \$3095, Atlas Profor \$955, or Atlas MapMaker for \$475. If you already have a desktop mapping program and just want the facts, you can purchase the European data for \$495. In addition, you can order more detailed street-level information. Strategic Mapping, 408/970-9600.

Reader service no. 661

Diamond Stealth Pro VLB, Viper VLB

Decisions, decisions. Choosing a VESA-compliant local bus graphics accelerator is a lot tougher now that Diamond is selling its speedy Stealth Pro VLB and Viper VLB cards. The Stealth Pro VLB uses fast VRAM and is based on S3's 928 chip, delivering 16 colors at 1280 by 1024 resolution and 72-Hz screen refresh in the 1MB configuration. With 2MB of VRAM, the Stealth Pro displays 256 colors at 1280 by 1024, or 16.8 million colors at 800 by 600. The Viper VLB uses Weitek's new P9000 chip set and 2MB of VRAM to deliver 256 colors at 1024 by 768 resolution, or 16.8 million colors at 800 by 600. The Viper card delivers flicker-free, 74-Hz refresh rates at both settings. The Stealth Pro VLB costs \$349 with 1MB of VRAM and \$499 with 2MB. The Viper VLB costs \$549. Diamond Computer Systems, 408/736-2000.

Reader service no. 662

FileMaker Pro Translator

Symantec's Q&A database program and you're thinking about making the switch to a Windows

database, you may have considered Claris's FileMaker Pro. After all, FileMaker is essentially a Q&A-like flat-file database with strong graphical capabilities. In order to attract Q&A users thinking of going GUI, Claris has developed a Q&A-to-FileMaker Pro translation program, which, for all intents and purposes, it's giving away.

FileMaker Pro Translator has an official list price of \$49, but the company is giving it away free to any registered FileMaker Pro user. In addition, you can download the program from America Online or Compu-Serve. Claris Corp., 408/727-8227, 408/987-3932 (fax).

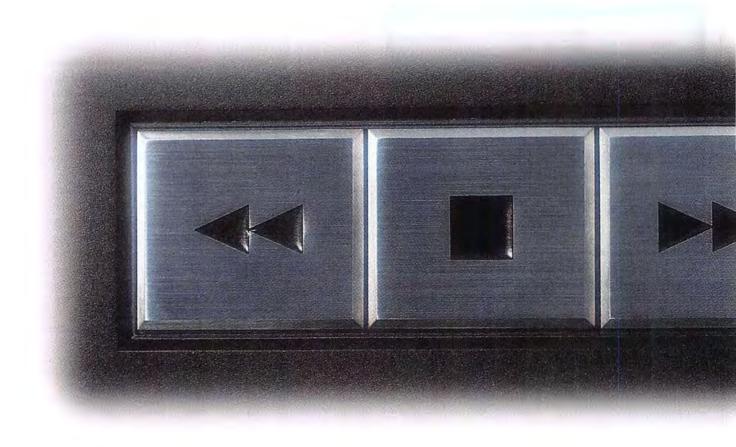
Reader service no. 663

Matrox MGA Impression Boards

Matrox is leveraging its workstation expertise to deliver a line of graphics accelerator boards based on its new 64-bit MGA chip set. The MGA Impression line comes standard with 3MB of VRAM. It employs a video memory bus that's twice the width of competing chips to deliver enhanced performance in common screen operations like bit-block transfers, which occur when you move large blocks of text, and screen draws. These boards can display 16.8 million colors at a full 1024 by 768 resolution at 80 Hz. All boards are available in ISA, Micro Channel, and VL bus configurations, with EISA and PCI variants to follow. The MGA Impression lists for \$1299 in ISA, MCA, and VL versions. Matrox, 514/685-2630.

Reader service no. 664

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



Intel's video brings the same easy

Intel Smart Video Recorde

Introducing Indeo™ technology and the Smart Video Recorder from Intel.

When it comes to putting video technology on your PC, Intel knows exactly which buttons to push.

Intel's Indeo™ technology is the first video compression technology that lets you cap-

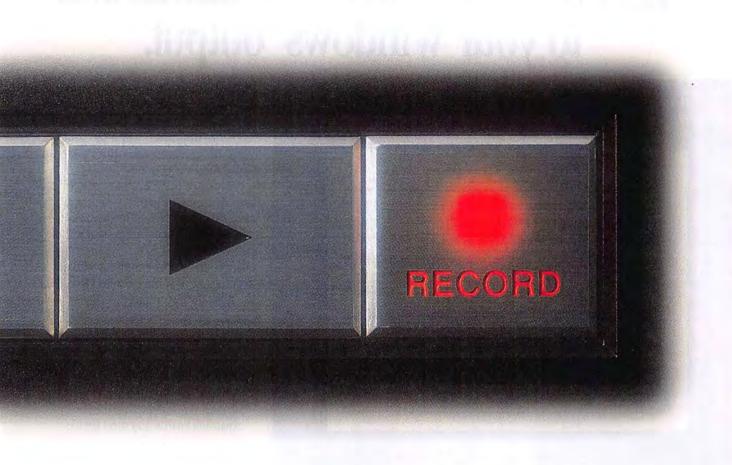
ture and compress video in one single step. (Now that's easy.) And the Smart Video Recorder is the first video

capture board that takes advantage of Indeo technology. Which means adding the impact of motion video to your business presentations is faster and simpler than you ever imagined.

Recording with the Smart Video Recorder is as simple as pushing a button. And it's fast. It only takes one minute to capture and compress a oneminute video clip. (Other boards take

up to 15 minutes.) One-step recording also cuts the Smart Video Recorder's disk space requirements

©1993 Intel Corporation. The Indeo logo is a trademark of Intel Corporation. *Third party trademarks are the property of their respective holders.



technology concept to your PC.

dramatically—it takes about 9MB to record a 60second clip. Other systems may require more than 50MB to record the same clip.

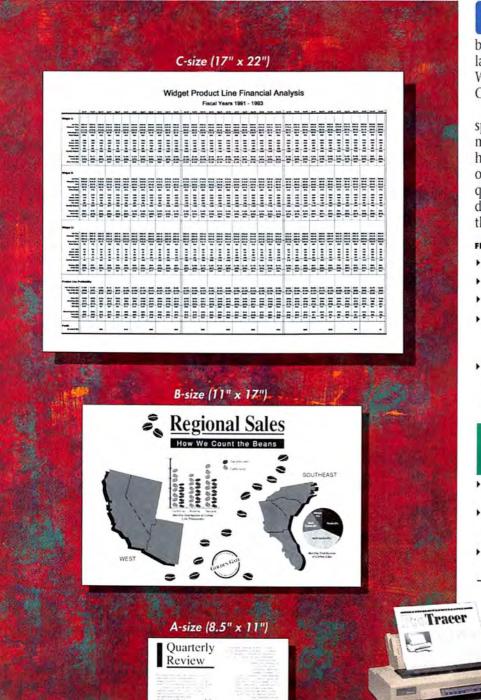
A key component of Indeo technology, scalable performance adjusts playback quality based on your system's processing power. And you don't need special hardware for playback. Scalable performance gives you the best playback possible from the computer you have now, and whatever computer you may use in the future.

You can get started right away, too, because Microsoft Video for Windows* and Asymetrix Compel* and MediaBlitz* software programs are included in the Intel Smart Video Recorder box.

To learn more about Indeo technology and the Smart Video Recorder, call 1-800-538-3373, ext. 1153. Or to receive information immediately, call Intel's automated FaxBACK® service at 1-800-525-3019 and ask for document 9874. Because with Intel, PC video is all fast forward.



Let ProTracer add a new dimension to your Windows output.



Windows is bigger than ever. And now your Windows output can be too. With ProTracer™, our personal, large format printer, you'll see your Windows creations grow from A-size to

C-size right on your desktop.

Think of the readability of a 17" x 22" spreadsheet. Or the impression you'll make with an 11" x 17" presentation handout. ProTracer serves a variety of output needs. Whether you need high quality PostScript® graphics, everyday text documents, or some of each, ProTracer is the ideal output solution.

FEATURES INCLUDE:

- High performance Canon[®] inkjet engine
- Fast, Intel i960[™] processor
- Sharp, 360 dpi resolution
- Optional accessories including PostScript language emulation cards, memory expansion boards, and sheet feeders
- Unsurpassed customer service 60-day money back guarantee, one year warranty, and unlimited technical support

ProTracer base unit

- Windows C-size ProPrinter driver
- Customized ADI® and PADI® drivers for AutoCAD® users
- ProPrinter and Epson emulations

with PostScript emulation

- ProTracer base unit
- PostScript language emulation card
- Windows C-size PostScript driver
- ▶ 8 MB memory

\$1349

\$2408

For the bigger picture, call
Pacific Data Products at (619)
625-3629, Fax (619) 552-0889.



nta Products Inc., 9125 Beho Dd., San Diego, I.A. 90221. In Europe, call (38) of 479609 is a fatherina of braffic Plata Products, Inc. 401 doeb be made and product names are fatalemarks or registered fractionals of their respective manufacturer. ProTracer uses Peers vollage, "the advanced imaging type-atting byteen from Ever.ess. BoverieDage is a registered fractionals of thomas, Technologies Ida. 6 1800 is their Dage State State.

Marketplace

A Monthly Survey of Prices on Popular Models

Over the Counter	Configuration	1 11111		National —	E
What you pay at retail stores for popular PCs (with monitors)	PU/speed RA (MHz) (M	MB) d	ard lisk (MB)	List price	Average street price
n/a = not applicable		/	(MB)		price
386-class desktop PCs			\		-
AST Bravo 3/33s	AMD386SX-33	4	120	\$1495	\$138
ALR Flyer SC 3/33s	i386SX-33	2	80	\$1098	\$99
DECpc 333sx LP	i386SX-33	4	52	\$1399	\$139
HP Vectra 386s/25	1386SX-25	2	84	\$2398	\$199
IBM PS/ValuePoint 325T	IBM386SLC-25	2	80	\$1339	\$133
AST Power Premium 3/33 1	i386DX-33	4	210	\$3460	\$300
Compaq Deskpro 3/33i	i386DX-33	4	120	\$2332	\$210
486SX-class desktop PCs					
AST Bravo 4/33s	1486SX-33	8	213	\$2360	\$217
Compaq ProLinea 4/25s	1486SX-25	4	240	\$1812	\$167
Epson America Progression 486SX/25	1486SX-25	4	240	\$2618	\$231
Gateway 2000 4SX-33	1486SX-33	4	170	\$1495	\$149
IBM PS/2 Model 85XP 486 ²	1486SX-33	8	212	\$4739	\$421
NEC Image 425	i486SX-25	4	170	\$2468	\$220
Samsung Deskmaster 486C/25	Cx486SLC-25	2	200	3	\$210
ZDS Z-Station 433Sh	i486SX-33	4	200	3	\$220
186DX-class desktop PCs					
AST Bravo 4/66d	1486DX2-66	8	210	\$3260	\$302
Compaq ProLinea 4/33	1486DX-33	4	240	\$2032	\$185
DECpc 466d2 LP	i486DX2-66	8	245	\$2949	\$294
Dell 466/M	1486DX2-66	8	320	\$3249	\$324
Gateway 2000 4DX2-66V	1486DX2-66	8	340	\$2895	\$289
Hewlett-Packard Vectra 486/66U	1486DX2-66	4	240	\$4358	\$385
Hyundai 466D2	1486DX2-66	8	360	\$2995	\$299
IBM PS/ValuePoint 433DX	i486DX-33	8	120	\$1989	\$198
Insight 486DX2-66	i486DX2-66	4	210	\$2199	\$219
Zeos 486DX/33	i486DX-33	8	245	\$2395	\$239
Portable PCs					
AST PowerExec 3/25SL	1386SL-25	4	60	\$2395	\$189
Compaq Contura 3/25	i386SL-25	4	120	3	\$165
Compudyne 386SL/25	i386SL-25	2	80	3	\$149
Dell 320SLi	i386SL-20	2	80	\$1849	\$184
Dell Dimension NL25	1386SL-25	2	80	\$1599	\$159
Gateway 2000 Nomad 450DXL	i486DX2-50	8	200	\$2995	\$299
Hewlett-Packard 95LX	NEC V20-5	1	n/a	3	\$55
Hyundai Courier Spectra	Cx486SLC-25	4	120	\$2699	\$269
IBM ThinkPad 700	IBM486SLC-25	4	80	\$2750	\$256
NEC UltraLite SL/20	i386SL-20	2	80	\$1699	\$143
Swan 486/SLC/25 Notebook	Cx486SLC-25	2	80	\$1795	\$179
TI TravelMate 4000WinDX	i486DX-25	4	120	\$3299	\$293
Toshiba T4400C	1486SX-25	4	120	\$3999	\$361
ZDS Z-Note 325Lc	i386SL-25	4	120	\$3392	\$339

From a national survey of more than 180 dealers by International Data Corporation. Figures are based on at least four price quotes for each machine in the manufacturer's standard configuration with monitor.

1 Uses EISA bus. 2 Uses MCA bus. 3 No price available.

The Top-Selling Used PCs

Based on 1993 sales volume as of April 1

(3) IBM PS/2 Model 80

Gateway 286

desktops

If your company has unwanted 386-based PCs, the time is right to sell them, according to John Hastings, president of the American Computer Exchange. His company brokers sales of used PCs. The current top sellers in the used market are 386 desktops, and you'll have the best chance of unloading them from now until December, says Hastings. After December, 486 prices should drop in reaction to new Cyrix and AMD processors and Intel's Pentium, and used 386 prices may plummet. Right now, strong demand for 386s continues among home users and businesses that want to try Windows, Hastings says.

Source: American Computer Exchange, Atlanta, Georgia

The Most Valuable Used PCs

Systems that have retained the greatest value

	1988 street price	1993 used price	Percent of value retained
1 Gateway 386/16	\$2950	\$850	37.7
2 Toshiba 5200 (386-based portable)	\$5950	\$1500	36.5
3 Zeos 386/20	\$3150	\$900	36.0
4 AST Premium/386 Model 300	\$3454	\$950	34.5
5 Dell System 310	\$4099	\$925	31.4

In deciding whether to sell or keep an old PC, consider how much of your investment can be recouped. According to American Computer Exchange president John Hastings, three factors help a PC retain value—a respected brand name, industry-standard components, and a reasonable initial price. If your used system meets these criteria, it is a good candidate for resale. No-name PCs don't garner much on the used-PC market, Hastings says, and it's best to pass them on to other employees.

Source: American Computer Exchange, Atlanta, Georgia



intellinside

performer, taking first place"







February 1993

November 1992

October 1992

COMPUTER SHOPPER

"looking for a fast computer you can trust, don't hestitate to order this one"



PC Magazine

*486SX/25 goes for high-powered, MAGAZINE high-quality image--and succeeds."

32 Bit Local Bus!

486DX 33MHz VL-B

Intel 486DX 33MHz
4MB RAM
VL-Bus VGA Card
VL-Bus IDE Controller
170MB Hard Drive
1.44 & 1.2 Teac Drive
101 Enhanced Keyboard
High Res Serial Mouse
15" SVGA Monitor
1 Year On-Site Service
MS Windows & DOS

\$1795

486SX 33MHz VL-B \$1695

\$998 486SX/25

486DX/2 66MHz VL-B

Intel 486DX/2 66MHz
4MB RAM
VL-Bus IDE Controller
170MB Hard Drive
1.44 & 1.2 Teac Drive
101 Enhanced Keyboard
High Res Serial Mouse
15" SVGA, Monitor
1 Year On-Site Service
MS Windows & DOS

\$1995

486DX/2 50MHzVL-B

\$1895

All Prices & Specifications are subject to change without notice. Please call to confirm pricing, specifications and warranty details. All products and company names are trademarks or registered trademarks of their respective holders. The Intel Inside Logo is a trademark of Intel Corporation.

Coupon Package

Upgrade your new systems or existing ACMA System and save \$100s of dollars with your coupons. The coupon must be sent in with order and this is a limited time offer.

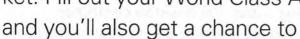
MultiMedia Kits
NEC CD-ROM
Sound Cards
15" & 17" MAG Monitors
NEC Monitors
Networking Cards & Kits
FAX Modem
& More!

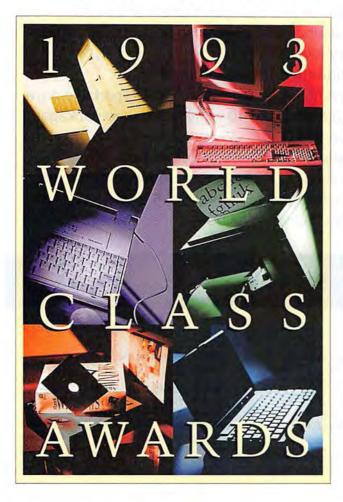


47988 Fremont Blvd., Fremont, CA 94538 (510)623-1212 FAX (510)623-0818

800-786-6888 Ext. 828

Each year PC WORLD's readers cast their ballots for the best hardware and software products on the market. Fill out your World Class Awards ballot this year





For a chance to win this year's top-rated hardware and software products, simply return your completed 1993 World Class Award ballot. And you may be one of three lucky winners to receive state-of-the-art prizes—worth nearly \$50,000!

3 Grand Prize Winners

Take home the World Class winners! A selection of the winning products, from the top 486 desktop to the best spreadsheet package, will be awarded to our three grand prize recipients.

First prize: Power and productivity with the world's most popular 486 desktop system, laser printer, software collection, and more!

Second prize: Take your office on the road with the highest-ranked notebook, removable/portable drive, modem, software collection, and more!

Third prize: The heavy hitter in the lightweight category with the toprated subnotebook, modem, software collection, and more!

Your opinion counts! And we'd like to thank you for it by automatically entering your name to win thousands of dollars worth of fantastic prizes. So let your voice be heard! Don't delay!

Guaranteed Prizes! For Hundreds of Early-Bird Entries

Be one of the first 500 readers to send in your ballot before June 30, 1993 and get an exclusive PC World wrist and mouse pad combination. The ballot is postage-paid, so grab a pen and vote today! Tell us what YOU think...and we'll publish the results, along with YOUR photo and actual prizes YOU'VE won, in our December 1993 issue.

How to Enter

Voting is easy! Simply write the names of your favorite PC products on the official World Class Awards ballot attached, and return it to PC World. Fill out as many categories as you wish. The



product receiving the most votes in each category will be designated a World Class Award winner. By voting, you make yourself instantly eligible to win your share of prizes worth almost \$50,000! Winners will be selected from a random drawing and notified personally by *PC World's* editorin-chief no later than November 1, 1993. Mail or fax your entry to *PC World* today!

First Prize Winning super 486 desktop computer

PLUS...the winning laser printer, sound board, CD ROM drive, fax-modem board, scanner, modem and pointing device, and your choice of 15 winning software packages. Estimated value \$28,000!

Second Prize Winning notebook computer

PLUS...the winning ink jet printer, removable/portable drive, modem, and your choice of 10 winning software packages. Estimated value \$14,000!

Third Prize Winning subnotebook computer

PLUS...the winning dot matrix printer, modem, extra battery pack, carrying case, and your choice of 5 winning software packages. Estimated value \$8,000!

Category Descriptions: To help you cast your votes, we've supplied background information on product categories that may need additional explanation.

Hardware

Laptop/notebook computer: A batterypowered portable computer typically measuring 12 by 10 by 2 inches or smaller and weighing 6 to 10 pounds.

Subnotebook computer: A battery-powered portable computer typically measuring 5 by 8 by 2 inches or smaller and weighing less than 6 pounds; has usable touch-type keyboard.

Fax-modem board: An add-in card that lets you send and receive faxes and communicate with other PCs, on-line services, and BBS's.

Graphics accelerator board: A high-resolution video board that speeds up operations in Windows and other graphical applications.

Removable/portable drive: A hard disk drive that can be physically removed from your PC and used on another similarly equipped PC.

Pointing device: Mouse, trackball, light pen, digitizing tablet, and so on.

Most promising newcomer: Hardware released after December 1992 that you feel has had the greatest impact on personal computing.

Best service and support: The hardware company that provides the best service and support—considering cost, hours available, responsiveness, length of warranty, on-site repair, toll-free numbers, extended warranties, turnaround policy, and related services such as a customer BBS or on-line forum.

Software

Desktop publishing: Program used to produce high-quality newsletters, brochures, reports, magazines, books, and other publications.

Presentation graphics: Program used primarily for producing charts for business presentations.

Draw software: Program for creating drawings, highly detailed technical illustrations, graphics, and fine art.

Image-editing/paint software: Program for manipulating artwork and scanned photos as bit-mapped images, allowing you to edit, cut, paste, airbrush, and more.

OCR software: Program that converts characters on a scanned page into text.

CD ROM title: Any software in CD ROM format (i.e., applications, multimedia, encyclopedias and other references, and so on).

Accounting: Program that provides doubleentry accounting capabilities. General ledger, accounts receivable, accounts payable, and other modules may be integrated in one package or available separately.

Personal finance: Program used to track personal expenses and income; does not include accounting packages (see previous).

Most promising newcomer: Software released after December 1992 that you feel

has had the greatest impact on personal computing.

Best service and support: The software company that provides the best service and support—considering cost, hours available, responsiveness, length of warranty, toll-free numbers, extended warranties, and related services such as a customer BBS or on-line forum.

Other

Best mail-order company: Tell us which mailorder company you'd recommend when buying software and hardware—considering cost, technical support, on-site repair facilities, refund and return policies, and so on.

BBS/on-line service: Vote for the best electronic bulletin board or on-line service offering E-mail, specialized databases, interactive forums, public domain and shareware programs, and so on.

QUESTIONS?

Call 800/234-0455, and we'll be happy to assist you in completing your ballot.

Please detach ballot and mail today!

PC WORLD 1993 World Class Awards Official Ballot and Entry Form

Dear Reader: Please use this official ballot and entry form to vote for products you are familiar with and would recommend, based on their performance and value. Choose only one product per category. You don't have to vote in all categories to be eligible for the contest prizes. Eligible products must be IBM PC compatible and commercially available as of May 1, 1993. To ensure accuracy, please supply (1) the manufacturer's name, (2) the name of the product, and (3) the model number for hardware or the version number—if applicable—for software. For Quickest Entry, Fax Your Ballot to PC World Today! 415/974-7404
Remember...the deadline to mail or fax your ballot is June 30, 1993!
Only one entry per person, and all entries must be submitted on an official ballot and entry form. If you don't have an official ballot and entry form, you can get one by sending a stamped, self-addressed envelope to PC World, World Class Ballot Request, 501 Second St. #600, San Francisco, CA 94107. Please call 800/234-0455 with questions or for assistance in completing your ballot.

Manufacturer

XYZ Company

HARDWARE

Sample entry

Desktop computer

Best mail-order company Best on-line service/BBS

Name	Title	
Company		
Street		
City	State	ZIP
Daytime phone		
Please print or type all information		

Model Number

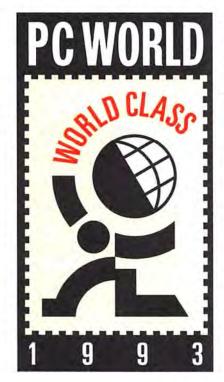
33

Name of Product

SuperPC 486SX

Desktop computer			
Laptop/notebook computer			
Subnotebook computer			
Laser printer			
Dot matrix printer			
Ink jet printer			
Color printer			
Monitor			
Fax-modem board			
Graphics accelerator board			1
Sound board			
Hard disk drive			
Removable/portable drive			
CD ROM drive			
Tape backup drive			
Scanner			
Pointing device			-
Most promising newcomer			
Best service and support			
SOFTWARE	Manufacturer	Name of Product	Version Number
Word processing	Manufacturer	Name of Product	version number
Spreadsheet			
Database (personal/professional)			
Communications			
Desktop publishing			
Font package			
Presentation graphics			
Draw software			
Image-editing/paint software			
Operating system/environment			
LAN operating system			
LAN E-mail package			
Fax software			
Utility			
Backup software			
Forms software			
OCR software			
CD ROM title			
Computer-aided design			
Programming language			
Project manager			
Personal information manager			
Accounting			
Personal finance			
Tax planning/preparation			
Game			
Shareware			
Mark assessations assessed as			
Most promising newcomer			

Guaranteed Prizes



to the **first** 500 readers who **return** their ballots to *PC World* before

Contest Rules

Entries must be postmarked no later than June 30, 1993. Each person may enter the contest

only once. Type or print your choices on the official World Class Award ballot and entry form on the other side of this page. Your entry must include your name, address, and daytime telephone number. Employees of product manufacturers are eligible to vote for any products other than those sold by their companies; violators will disqualify their company's product. Employees of PC World Communications, Inc., their agents, and their immediate family are not eligible. Please tape the form closed (DO NOT staple) when mailing. Grand prize winners will be selected by random drawing from entries.

Your chances of winning are better than ever!

Fold here and mail today! Please tape; do not staple.

NO POSTAGE
NECESSARY IF
MAILED IN THE
UNITED STATES

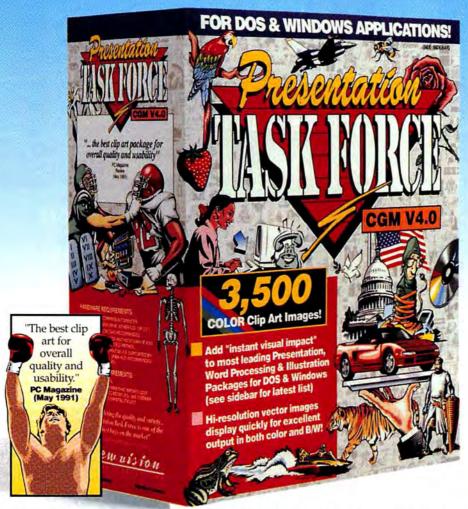
BUSINESS REPLY MAIL

First Class Mail Permit No. 22094 San Francisco, CA

POSTAGE WILL BE PAID BY ADDRESSEE

ATTN: PC World Research Department

1993 World Class Awards Ballot 501 Second St. #600 San Francisco, CA 94107-9833



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 onetwo combination of
both quality and value,
making it the undisputed
heavyweight champion of the
clip art world.

PRESENTATION TASK FORCE IS A REGISTERED TRADEMARK OF NEW VISION TECHNOLOGIES INC. ALL OTHER PRODUCT NAMES ARE THE PROPERTY OF THEIR RESPECTIVE COPPRISH COWNERS. ALL PRICES SHOWN IN US DOLLARS (DEALERS MAY SELL FOR LESS), CANADIAN INSL \$229.00. CALL FOR INTERNATIONAL PRICING. NEW VISION TECHNOLOGIES INC., 38 AURICAL DRIVE, UNIT 13, NEPEAN, ONTARIO, CANADIA NEE BAS TEL (613) 727-6164, FAX (613) 727-6190.

TASK FORCE

WORKS WITH:







ALDUS FREEHAND

AMI PROFESSIONAL

APPLAUSE II

CHARISMA

CORELDRAWI

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

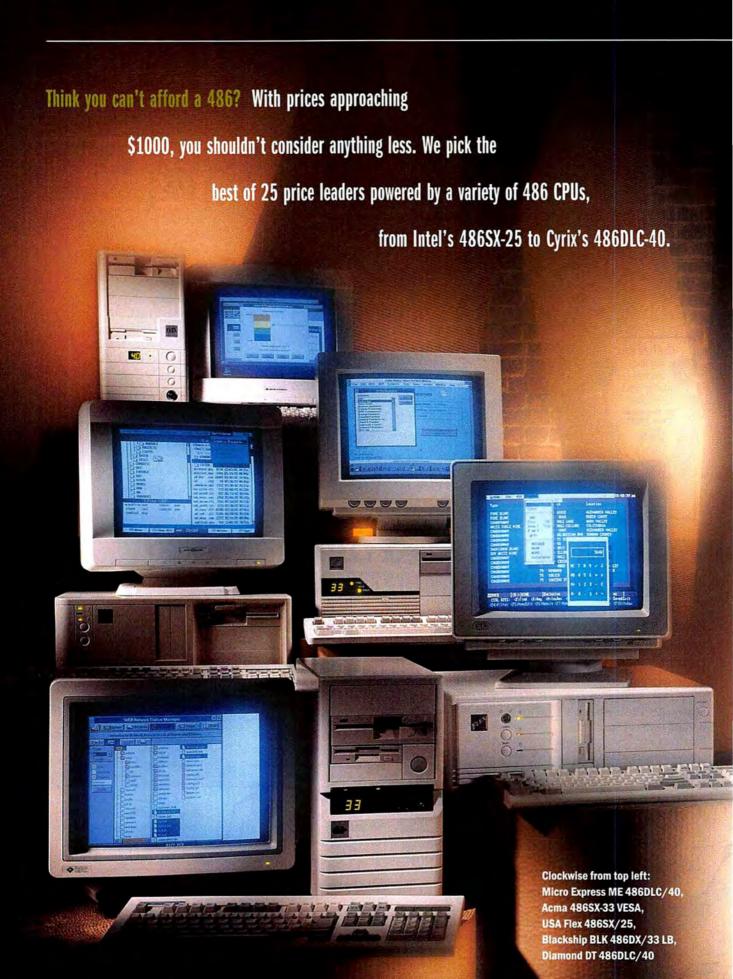
WORDPERFECT FOR WINDOWS
PLUS DOZENS MORE!

"Outstanding value & excellent art to boot! ...by far the best value of all the clip art libraries we reviewed."

PC Computing (May 1992)

Available at Software Resellers Everywhere!

Circle 177 on reader service card



Setting out to buy a brand-new computer—even a basic business PC—is a bit like shopping for a new car. Just as you can't help dreaming about a Rolls Royce or a Corvette, you have to check out those top-of-the-line 486DX2-66s. But your budget can't support the monthly payment—and in your heart, you know you don't

By Rex Farrance and Melissa R. Riofrio

need that kind of raw horsepower just to turn out basic reports and spreadsheets.

Does that mean you have to kiss your 486 dreams good-bye? Not on your life. We went on a bargain hunt for complete systems costing \$1250 or less, and we were blown away by what we came up with—at last summer's price for a 386SX. Vendors didn't get an easy ride, either: We insisted on 486s only—in a configuration adequate for DOS business use. That adds up to at least 2MB of RAM, one floppy drive, a 60MB hard disk, VGA and a color display, a keyboard, and DOS 5.0 (DOS 6.0 had not been released). Out of 25 vendors submitting PCs that made it

COVER STORY 486s FOR \$1250

into our review, 16 met or beat our price, and only 2 exceeded our mark by more than 10 percent. The least expensive machine of all was the Netis Technology N425VL, which costs just \$1025 with 4MB of RAM and an 80MB hard disk.

The Processor Hit Parade

The PCs in this review present a surprisingly diverse array of processors. Most prevalent was the Intel 486SX-25, which powered thirteen of these workhorses. A single lower-speed 486SX-20 entered the race. These 20- and 25-MHz CPUs are common in budget systems; while capable, they're the least powerful of the Intel 486s. Only one 486SX-25 system achieved the combination of value and quality it takes to win a PC World Best Buy.

Intel no longer has a monopoly on the 486 market, however. We also tested two PCs using the new Cyrix 486DLC-40. The systems based on this 40-MHz CPU were not only fast-nailing down two of the ten top positions overall-they're also great values. Both PCs bearing these new processors earned Best Buys, and one, the Micro Express ME 486DLC/40, rated as the top overall value.

In addition, we checked out five low-cost PCs using Intel's new 486SX-33. These systems also made a fine showing at the high end of the value curve. And one of the 486SX-33s achieved a Best Buy along with one of three bargain PCs we received based on the reliable and speedy 486DX-33. To round out our group, we had a surprise appearance from one of the most powerful PC processors available—the 50-MHz 486DX beating at the heart of the Auva 486DX/50 Model S10.

Moving in Fast Company

The first step in any PC World review is taken in the PC World Test Center, where

our technicians put in long hours running systems through the wringer. Test Center director Greg Smith confirmed our own gut instincts-DOS applications would be the sole testing option for this review. Why? Although systems with only 2MB of RAM can run some basic Windows applications, they can't complete our Windows benchmarks. With that in mind, the test center ran a suite of DOS business application tests using the popular WordPerfect 5.1, 1-2-3 3.1, Harvard Graphics 3.0, and Paradox 3.5.

It was no surprise that the Auva 486DX/50 Model S10—with its muscular 50-MHz Intel 486DX processor—wound up as the top dog in overall performance. But we weren't expecting the Cyrixbased Micro Express ME 486DLC/40 to power its way into second

Best Buys

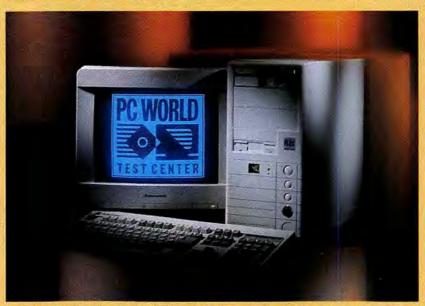
Low prices, great performance, excellent support—the five Best Buys in this review prove that these days top value doesn't demand top dollar. While they all came with 4MB of RAM and at least 64K of secondary RAM cache, the variety of processors shows that you can find excellent performance anywhere along best, the Micro Express ME 486DLC/40, placed among the top five in all categories. Close behind, the Acma scored high in performance, the Blackship in performance and service, and the USA Flex in service. The Diamond DT 486DLC/40 earned its Best Buy with a smooth blend of speed, expandability, and design. The Polywell, the Netis, the Keydata, the ATronics, the Packard Bell, and the CUI systems were nipping at all their heels.

1. Micro Express ME 486DLC/40 (page 119)

the 486 spectrum, whether the processor

comes from Intel or Cyrix. The best of the

- 2. Acma 486SX-33 VESA (page 105)
- 3. Blackship BLK 486DX/33 LB (page 110)
- 4. USA Flex 486SX/25 (page 126)
- 5. Diamond DT 486DLC/40 (page 111)



The Best Buy Micro Express ME 486DLC/40 is our overall top value. Both Cyrix 486DLC-40 systems in our review proved to be outstanding values.

place-even with the help of its 512K IDE caching hard disk controller. The next five positions were filled by 33-MHz Intel 486s—four SXs and one DX.

The 33-MHz 486DX has earned its reputation as the business standard for desktop PCs, and our tests indicate that the 486SXsubstantially identical except for its lack of a math coprocessorstacks up very well against the DX in handling most business applications. Past looks at systems based on the 33-MHz Cyrix 486DLC revealed performance comparable to the Intel 486SX-25. The 40-MHz Cyrix 486DLC PCs, however, performed on a higher level, taking two of the top ten spots overall. None of the 25-MHz 486SXs managed to break into the top ten.

Upgradability-The Key to a Faster Tomorrow

You buy a 486 primarily to increase your working speed and gain the power to handle more demanding applications. But even if your PC isn't pressed into processor-intensive service right now, it may be in the future. That brings up a second critical reason for choosing a 486: upgradability. The ability to upgrade is particularly important in a system that isn't already near the top of the performance curve—for example, a 486SX-25. Fortunately, all the systems in this review can be upgraded to an Intel OverDrive CPU-the easiest and most cost-effective way to increase your processing speed. Twenty-one machines also have adjustable or upgradable system clocks. This combination of features enables you to reset the system clock on, for example, a 25-MHz 486SX system to 33 MHz and install a powerful 66-MHz OverDrive Chip.

A number of PCs in this roundup have CPUs soldered either directly onto the motherboard or onto a card that plugs into a processor socket. The former have upgrade sockets, and the latter can have their processors removed and replaced. In either case, you can upgrade using an OverDrive CPU, although in the former case you can't remove and reuse the original CPU. The AST Bravo 4/25 provides a unique upgrade to its immovable CPU: You install a card containing a CPU socket and external memory cache in a special connector on the motherboard.

Putting It All Together

Careful attention to configuration and expandability will maximize the use you get out of an affordable PC. For example, memory has a big impact on performance and sets the threshold for Windows use. Half a dozen of the computers came equipped with our basic RAM requirement: 2MB, which is adequate for most DOS word processing and light spreadsheet or database work. You need more RAM for running Windows, and 18 machines came with the 4MB you need for basic work in that environment. One vendor, Packard Bell, really went whole hog with its PB425/8-loading it up with a Windows-optimized 8MB of RAM.

Although all 486s have an internal, performance-boosting memory cache, we were pleased to learn that almost all of these affordable systems came with a secondary memory cache. Only three-the ALR Flyer SD 4/25s Model 80DW, the Quill Qtech PCS-4S25, and the Silicon Valley SVC 486SX/33 35 Pylon II—came unequipped to hold a second-level cache. Almost three-fourths of the other systems provided at least a 64K secondary RAM cache, and the majority of those had either a 128K or 256K cache. Past PC World Test Center benchmarks indicate that a second-level cache gives a system a 7 to 10 percent speed boost in typical business applications. With that in mind, we advise buying a system with at least 64K of secondary memory cache.

Hard disks are one of the most expensive components in any system, and we expected to feel the storage pinch. Surprisingly, however, Polywell was the only vendor that sent us the 60MB hard disk we consider the minimum for practical DOS use. Nineteen other PCs came with 80MB drives-the minimum starter size for Windows users. AST, ATS, and Diamond sent computers with a more liberal 120MB of storage. The Gateway 2000 4SX-25 provided a truly generous 170MB drive, and the Packard Bell PB425/8 had an impressive 245MB hard disk. As is common with most current PCs intended for desktop use, all these systems came with IDE drives.

Best Price



The cheapest systems in this review are almost all 486SX-25s. You wouldn't expect to find the fastest or most featurepacked systems here, but smack in the middle of this group sits our premier Best Buy, the Micro Express, which shows that a low price can translate to top-notch value.

- 1. Netis Technology N425VL (page 120)
- 2. Quill Qtech PCS-4S25 (page 124)
- 3. Micro Express ME 486DLC/40 (page 119)
- 4. CAF Gold 3D (page 110)
- 5. ALR Flyer SD 4/25s Model 80DW (page 105)

Best Service and Support



Even at these price levels, compromising on service and support would be penny-wise and pound-foolish. If you want toll-free support and free or low-priced on-site ser-

vice, look no further. All but a few systems in this review provided adequate support, but among the top five you'll find three Best Buys.

- 1. Micro Express ME 486DLC/40 (page 119)
- 2. USA Flex 486SX/25 (page 126)
- 3. CUI Advantage 486/25SX (page 110)
- 4. Blackship BLK 486DX/33 LB (page 110)
- 5. Dell 425s/L (page 111)

Best Performance



Auva's 486DX/50 Model S10, the one system that came with a 50-MHz 486DX processor, took the lead in this race. But the real winner here is you. Hot on the

heels of the Auva was the Micro Express ME 486DLC/40 that topped our Best Buy list, with two other Best Buys coming up close. Among such company, fast and cheap are badges of honor.

- 1. Auva 486DX/50 Model S10 (page 106)
- 2. Micro Express ME 486DLC/40 (page 119)
- 3. Acma 486SX-33 VESA (page 105)
- 4. Blackship BLK 486DX/33 LB (page 110)
- 5. ATronics ATI-486SX/33 (page 106)

COVER STORY 486s FOR \$1250

Affordable Expandability

As with any PC, you need enough expansion slots and drive bays to accommodate present and future peripherals. If you're planning to hook your computer up to a network, you'll probably have server access, and typically you'll be able to get by with a total of three bays—one internal and two externally accessible—and three or four free expansion slots. But for a stand-alone PC, you'll want at least one more bay and one more slot.

Pay careful attention to the number of externally accessible bays. You're likely to need to add a second floppy drive, if your system doesn't already have one, and you'll probably want at least one other accessible bay free to accommodate a tape backup or CD ROM drive. In a pinch, you can always buy external drives—but you'll pay \$100 or more extra and sacrifice some desk space. Another way to keep an accessible drive bay free is to use a combination floppy drive, which fits both standard floppy formats into a single half-height 5¼-inch bay. However, none of these bargain-priced systems came with a combo drive.

A Fast Look at Video

Your video subsystem—graphics adapter and monitor—can make or break a system purchase. All the vendors except Netis Technology and Quill Computer Products provided accelerated video. While graphics accelerators are generally desirable and becoming standard,

we consider them essential if you're planning to run Windows. If you're thinking of doing heavy-duty graphics work, you can improve on a 16-bit accelerator by using a 32-bit local bus accelerator running at system clock speed rather than at the 8-MHz rate of a typical 16-bit expansion slot. Four

systems here have local bus video: The Best Buy Acma 486SX-33 VESA, the Gateway 2000 4SX-25, and the Polywell Poly 486-33V, and the Best Buy USA Flex 486SX/25.

In addition, although all the monitors had a 14-inch diagonal, some vendors managed to provide extra quality. For example, the monitor with the Best Buy Acma 486SX-33 VESA supports a non-interlaced display and a 70-Hz vertical refresh rate at top 1024 by 768 resolution. That combination should minimize flicker and be easier on the eyes for most users. In this competitive market, you can get a quality video system with an inexpensive machine.

Keeping Service in the Picture

Service and support issues are crucial, whether you're paying top dollar for your machine or buying a bargain. Warranties on the PCs we're reviewing here vary from a one-year minimum to the fantastic three-year coverage that comes with the Xinetron X/LAN Station 486SX. Since labor is often one of the most expensive components of a repair job, it's worth noting that Polywell will repair its equipment free of labor costs for an amazing five years. Over two-thirds of the vendors provide a year of on-site service for \$100 or less, and nine throw it in free with your system purchase.

Most of the time technical problems are minor; that's when you need quick, competent advice—preferably delivered without your having to make a toll call. Auva and Silicon Valley have no central support lines, leaving you dependent on dealers who may be untrained or ill-equipped for tech support. Among the other vendors,

ATS, CAF, Netis, Quill, and Tandy make you pay the toll; the rest have toll-free lines. With the current welcome trend toward improved service and support, we're seeing more weekend support, electronic BBS's, and fax lines. We base our evaluations not only on company policies but on calls we make incognito that simulate real technical problems. This time, Micro Express, USA Flex, and CUI formed a tight cluster at the top of our service and support chart.

The Best of the Best

We found so many terrific values, it was hard to stop at only five Best Buys. After sweating out our evaluation, we settled on five excellent systems that meet or better our price point. As a bonus, all give you the RAM and storage you need in a basic Windows workstation. The top overall value is the Micro Express ME 486DLC/40. This standout system is built around the new 40-MHz Cyrix DLC chip, and it presented a staggering résumé, nailing down an excellent rating on performance, price, and service and support. Its second-place showing in performance was exceeded only by a system using a 50-MHz Intel 486DX. In addition, the ME 486DLC/40's \$1150 direct price is one of the best here, and Micro Express had the top rating on service and support.

The Acma 486SX-33 VESA turned in a close second in overall value, earning its Best Buy with a fine blend of hot performance, local bus video, and a terrific monitor. Almost tied with the Acma,

We found so many terrific values, it was hard to stop at only five Best Buys. After sweating out our evaluation, we settled on five excellent systems that meet or better our price point.

the Blackship BLK 486DX/33 LB puts together a winning mixture of speed and service and support to merit its Best Buy.

Of the thirteen systems reviewed that were based on the Intel 486SX-25 CPU, only the USA Flex 486SX/25 earned a Best Buy. USA Flex accomplished this by presenting a well-balanced package that included local bus video and a local bus IDE drive connector and one of the highest service and support scores here. Finally, Diamond won its first *PC World* Best Buy with its DT 486DLC/40 system, based on the Cyrix 486DLC-40 CPU. The easily upgradable Diamond system has an even mix of quick performance, good expandability, and sound design. The presence of two out of two 40-MHz Cyrix DLC systems in our winner's circle suggests that value-priced 486DLC-40 systems deserve close consideration.

After getting our hands on 25 inexpensive 486s, one message comes through loud and clear. You don't have to give up processing power, upgradability, or quality to put an ultra-affordable system on your desk. No matter what your application, one of the 486s reviewed here can handle it. After looking at values like these, we can't see why you'd consider anything less.

Rex Farrance is an associate editor and Melissa R. Riofrio is an assistant editor for PC World. Rex can be reached on PC World Online as REXFARRANC (see page 10 for more information).

For more information about all products in this article, circle reader service no. 902.

Acma 486SX-33 VESA



VITAL STATISTICS

Direct price: \$1249
Processor: 1486SX-33
PROS: Fast, local bus video, upgradable to 66-MHz OverDrive
CONS: Cramped access to RAM
Contact: Acma Computers,
510/623-1212, 800/786-6888
Reader service no. 670





Acma systems have hit the sweet spot in so many PC World reviews—winning Best Buys in October,

November, and February—that we were eager to see what kind of PC Acma produces for \$1249. The 486SX-33 VESA turned out to be just the kind of value we were hunting for.

Acma paired the hot new Intel 33-MHz 486SX CPU with 128K of secondary memory cache. This combination helped the system nail down third place in overall performance, with a sparkling second-place showing on the *Paradox* test, a strong third-place tie on *WordPerfect*, and a more-than-respectable fifth on 1-2-3 and *Harvard Graphics*. If you don't use a program that is dependent on a coprocessor to crank up its speed, our tests indicate that the 486SX-33's performance is comparable to the 486DX-33's. But if you need more speed and a coprocessor to handle CAD or another application in the future, you can always extract the SX chip and install a hot 66-MHz 486 OverDrive.

The 486SX-33 VESA isn't a stripped system by any means. With 4MB of RAM, an 80MB hard disk, and a Diamond Stealth 24 VLB local bus accelerator card with 1MB of DRAM, the Acma can run Windows at a good clip. What's more, you get a Mag LX1460 monitor, which can run 70 Hz noninterlaced at its top 1024 by 768 resolution. That should relieve any worries you might have about eyestrain. When you need room to add peripherals—such as a sound board or a SCSI host adapter—you'll find plenty in the Acma's six free slots, one of which will accept a VESA local bus card. All four drive bays are externally accessible, so you have room to add a second floppy drive and a tape or CD ROM drive.

Acma gives you other nice touches, such as a neat little cover for the reset, power, and turbo buttons, and the key lock—great for warding off accidental resets when you're working at home, especially if you have small children around who are a little too eager to lend a hand. And the company prints safety warnings and a checklist for basic troubleshooting on top of the power supply inside the case. Service and support is solid, too. The Acma comes with a year of free on-site service and toll-free technical support—even on Saturdays. The tech staff proved both responsive and competent.

So what is there not to like? Well, system memory is positioned under the power supply, which makes it a little awkward to upgrade. Balancing this quibble against the PC's many strong points, however, resulted in the second-best overall value in our roundup. In fact, this system is more than just one of the gems in this month's review: For our money, the Best Buy Acma 486SX-33 VESA would stand out on any desktop.

ALR Flyer SD 4/25s Model 80DW



VITAL STATISTICS

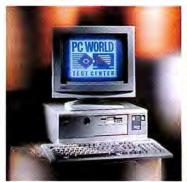
Direct price: \$1198
Processor: i486SX-25
PROS: Excellent price, service, and support
CONS: Mediocre performance, limited expandability
Contact: ALR, 800/444-4257, 714/581-6770
Reader service no. 671

It surprised us to find an ALR 486 available for less than \$1200 direct from the manufacturer—even with just 2MB of RAM installed. Granted, ALR has done plenty recently to lighten up the price side of its price-means-quality design. And to the company's credit, it has maintained the quality and innovative design of its PCs. Furthermore, ALR's service and support standards are excellent, exceeding those of most vendors. For example, the Flyer SD 4/25s Model 80DW we reviewed here is backed with toll-free technical support 11 hours a day, with Saturday support as well. Responsiveness is terrific, and advice is helpful and accurate. Fax support? BBS support? ALR covers all the bases and tops it off with an on-site service policy covering the first year for a nominal \$9.95.

This Flyer model is a low-profile unit designed for use on a LAN or where expandability isn't vital. There are only three drive bays, with two already filled. The system also has just three free expansion slots. In addition, ALR managed to fit a proprietary 16-bit slot—designed to fit ALR's fax-modem, SCSI host adapter, or ethernet adapter—into an unused corner of the baby motherboard.

This PC isn't a top performer: The 25-MHz Intel 486SX has limitations, and there's no secondary RAM cache to help out. The Flyer managed lower midrange performance overall, although it fell to last on the 1-2-3 benchmark and next to last on Paradox. This PC is worth considering if you need a LAN station and want to buy from a name vendor with a fine track record. If you need speed and expandability, however, you can find a better fit elsewhere.

AST Bravo 4/25s



VITAL STATISTICS

Street price: \$1450
Processor: Intel 486SX-25
PROS: 120MB hard disk
CONS: Priced over \$1250
Contact: AST Research,
800/876-4278, 714/727-4141
Reader service no. 672

AST is well known as a manufacturer of fast, high-quality systems. In February, the 66-MHz Bravo 4/66D won a Best Buy partly by beating all comers on performance. The AST Bravo 4/25s in this

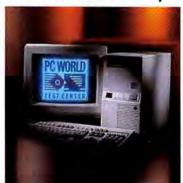
COVER STORY 486s FOR \$1250

review is also reasonably quick, especially considering that it's a 25-MHz 486SX. While the system's performance was midrange overall, it outran all but one of its twelve 486SX-25 classmates. Storage and memory are quite generous for an entry-level box, too, with 4MB of RAM and a 120MB hard drive.

The 25-MHz 486SX CPU is soldered onto the motherboard. To upgrade your CPU you purchase a secondary RAM cache module, which contains a CPU socket. Whereas the AST we reviewed in February was one of the most reasonably priced 486DX2-66s we've run into, this \$1450 system has the second-heftiest price in our roundup. AST does throw in *Windows* and a mouse, however, and an expensive monitor that supports a noninterlaced display at 1024 by 768 resolution.

Our system had two free externally accessible bays and four free slots. Service and support is excellent, with a year of free on-site service, toll-free technical support, a BBS, and fax support. Although the AST Bravo 4/25s seems pricey for a 486SX-25, if you want a fine *Windows* system, the great video setup and top service make AST's entry worth considering.

ATronics ATI-486SX/33



VITAL STATISTICS

Direct price: \$1295

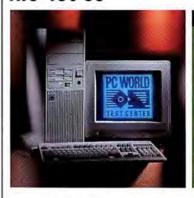
Processor: i486SX-33
PROS: Fast, expandable
CONS: Priced over \$1250, CPU
hard to access
Contact: ATronics Int'l,
800/488-7776, 510/656-8400
Reader service no. 673

ATronics has impressed us time and again with its capability to address specific product needs. In January, the company sent us one of the best \$2500 Windows PCs we've ever seen—assembling a Best Buy array of powerful, well-considered components—and hitting our price point right on the nose. In this review, the ATronics overshot our target price by \$45 but also delivered more than our minimum configuration. The 4MB of RAM and 80MB hard disk, for example, make the difference between being able to run Windows or not, and the powerful 33-MHz 486SX processor and generous 256K of external RAM cache ensured that the ATI-486SX/33 would not get mired on the bottom of the performance chart. In fact, this system ranked number five in overall performance and sped past all but two other machines on the Harvard Graphics and disk-intensive Paradox benchmarks.

The ATronics unit is a short minitower model with a single floppy drive and room left for three more externally accessible drives. You also have plenty of space for installing peripherals in the six free expansion slots. Upgrading this system wouldn't be entirely painless, however, you'd have to pull the 3½-inch drive cage to extract the CPU. That quibble aside, this motherboard gives you the option of installing a new 50-MHz clock and putting in a 486DX-50, or you can take the more logical path of retaining the 33-MHz oscillator and installing a 66-MHz OverDrive.

The ATronics service and support picture looks good too, with toll-free support and a responsive technical staff who answered every query perfectly. A first-year on-site policy costs \$99. The only support drawbacks are the lack of BBS and weekend support. The ATI-486SX/33 came with the performance, RAM, and storage it took to break into a jam-packed top ten of overall values.

ATS 486-33



VITAL STATISTICS Direct price: \$1300

Processor: 486DX-33

PROS: 120MB hard disk, fouryear labor warranty

CONS: No toll-free tech support, priced over \$1250

Contact: ATS Computers,

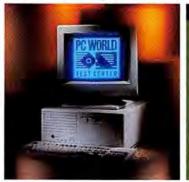
619/279-1305 Reader service no. 674

The ATS entry in our affordable 486 sweepstakes is a roomy halfsize tower unit. Even with the single 5½-inch floppy drive and 120MB hard drive installed, there's room aplenty for two internal and four externally accessible drives. A half-dozen free 8/16-bit slots should meet any desktop user's needs.

This PC doesn't lack power: It combines an Intel 486DX-33 with a 256K secondary memory cache to crank out very good overall performance. If you need more speed in the future, you can upgrade to a hot-running 66-MHz OverDrive upgrade.

The 14-inch Shamrock monitor makes a fine team with the Diamond Speedstar graphics accelerator with 1MB of DRAM. ATS also gives you some service extras, such as a four-year labor warranty to complement the one-year parts warranty. The tech support staff was responsive and accurate. But on-site service is a pricey 10 percent of system cost—or \$130 for this \$1300 PC. And you have to pay the toll on ATS's central support line. This is a good system, all the same—so good that if the company had toll-free support and less-expensive on-site service, it would have rated a Best Buy.

Auva 486DX/50 Model S10



VITAL STATISTICS

Street price: \$1299
Processor: 486DX-50
PROS: Fastest system in roundup
CONS: Priced over \$1250, no central support
Contact: Auva, 714/562-6988
Reader service no. 675

We're not surprised to see a 50-MHz processor in a server or a CAD workstation, but we were blown away to find one inside a \$1299 PC submitted as an affordable 486. The Auva



Does Your Keyboard Speak...



...Windows™?

The Key Tronic Trak101™ keyboard offers all the features of an enhanced 101-key layout with the added power of an integrated trackball that's customizable for ease of use and enhanced productivity. The Trak101 is *the* keyboard for Windows.



...Word Processing?

The KB101 PLus™ keyboard from Key Tronic offers all the features of an enhanced 101-key layout with the added benefits of larger backspace and return keys. The KB101 PLus features high performance capacitance switch technology, double-shot molded keycaps and a durable enclosure.



...Macros?

The FLASH101™ keyboard from Key Tronic offers unique styling, all of the features of an enhanced 101-key layout, plus the added power of on-screen programmability. The FLASH101 lets you quickly preview function keys, macros and other programmed keystrokes right on your CRT.



...Spreadsheets?

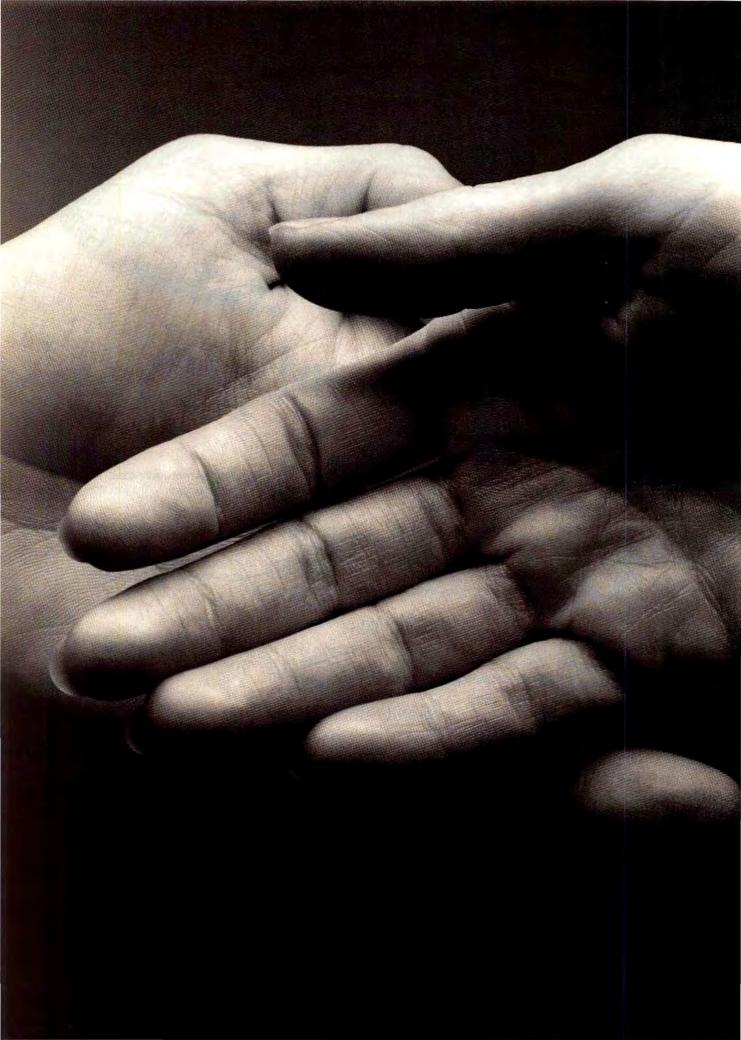
The ABACUS™ on-line keypad from Key Tronic offers a uniquely functional and dramatically styled keypad that has been designed with calculator functions, F-key references (Mac version only), page control functions (PC version only) and a Send Key™ that pastes calculations directly into your text or spreadsheet.

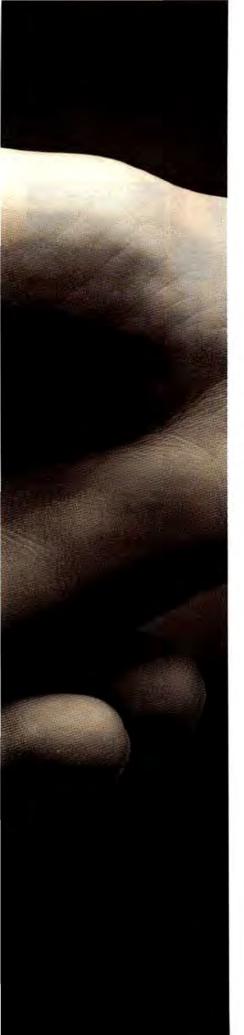
When It Comes To Applications, Key Tronic Speaks Your Language.

To find out more about the Key Tronic family of products, 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.



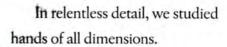








TO DESIGN OUR NEW MOUSE, WE STARTED BY READING PALMS.



We consulted professors of kinesiology, engineers, ergonomists and computer users. We used digital fiber optics to analyze the human hand. We followed it in motion.

The result is a new Microsoft*

Mouse that is, well, anatomically correct. Uncommonly comfortable.

The palm is perfectly supported. Left or right handed, the grip is comfortable. Fingertips fall naturally into place. A click feels just right.

This mouse even looks good. Intriguingly asymmetrical. Yet it somehow reminds you of the gentle curves of a human form.

Did we mention that it also has some innovative new software features? They allow you to customize the mouse, so it works the way you like to work.

Try the new Microsoft Mouse. If you're not comfortable, we'll refund your money. Guaranteed. Details are on the box, which you can quickly get your hands on at a computer store near you.



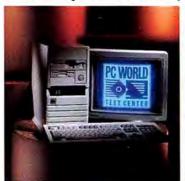


486DX/50 Model S10 features a full 50-MHz Intel 486DX CPU, a 256K secondary memory cache, and 4MB of RAM. Riding the wings of this powerful combination, the Auva soared to number one in overall performance, first on the *1-2-3* and *Paradox* benchmarks, and second on *WordPerfect* and *Harvard Graphics*.

The story doesn't end with speed. There's good expandability in the compact case, even with two floppy drives and a hard disk installed. You can add two more externally accessible drives, and Auva got five free slots onto the tiny motherboard.

Unfortunately, Auva provides no central support for purchasers, nor does it require dealer support training. That means if you buy this PC, you must make sure your dealer is competent and will remain available to give reliable technical support. There is a support line for dealers, but the lack of end-user support is hard to swallow. Auva won't sell you an on-site service policy either. Otherwise, this is a very good PC. But in our opinion, unless your confidence in your dealer is unbounded, you shouldn't consider a product with this level of support.

Blackship BLK 486DX/33 LB



VITAL STATISTICS

Direct price: \$1250
Processor: 486DX-33
PROS: Fast, both floppy drives, excellent service
CONS: None
Contact: Blackship Computer
Systems, 800/531-7447,
408/432-7500
Reader service no. 676







Blackship always seems to deliver real value to budget-conscious buyers, and the

BLK 486DX/33 LB is no exception. This PC offered so much more than we were asking for, we *had* to give it a Best Buy. A 486DX-33 processor in a \$1250 unit is always a great deal and virtually guarantees good performance in this price class.

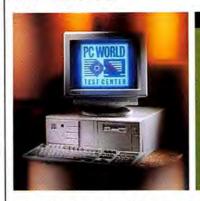
With 4MB of RAM and a 64K secondary RAM cache, this unit came in fourth on overall performance and a sterling second on the 1-2-3 benchmark. These results reinforce our contention that the first 64K of external RAM cache gives the biggest payoff. If you think you'll want a larger cache, however, ask Blackship to install it before you complete your purchase. That way you won't have to remove the drive cage to do your own upgrade.

You'll be pleased to learn that this handsome little minitower comes with both floppy drives and an 80MB hard disk. And you have room for two more externally accessible drives plus six free 8/16-bit slots (including two VESA local bus slots). The versatile motherboard supports speeds from 20 MHz to 50 MHz, opening an array of upgrade possibilities. The most logical choice for a future speed boost would be to swap in a 66-MHz OverDrive CPU.

Buying a PC without solid service and support is like forgetting to buckle up for a long road trip. With Blackship, the belt is securely fastened. The toll-free tech support lines are staffed by courteous, competent, and responsive technicians. And the support BBS and

fax service is handy, too. To top it off, a year of free on-site service comes with your PC, and the company's two-day turnaround service policy is just fine. All this in a computer that costs \$1250 direct from the vendor spells Best Buy in our book.

CAF Gold 3D



VITAL STATISTICS Street price: \$1195 Processor: i486SX-25 PROS: Excellent price, expandable, good accessibility CONS: No toll-free support, mediocre performance Contact: CAF Technology, 818/369-3690

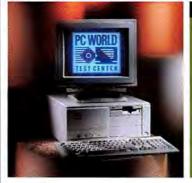
Reader service no. 677

The CAF Gold 3D is a good-looking Intel 486SX-25 system with a terrific \$1195 street price. Its roomy desktop case gives you plenty of space for drives and peripherals, with five drive bays paired with five free slots (four 8/16 bit and one 8 bit). Accessibility is near perfect. The motherboard supports a clock swap to 33 MHz, and the CPU socket accepts up to a 66-MHz OverDrive.

Buyers of this system may want to take advantage of that upgrade path: Even with 64K of secondary RAM cache installed, the CAF runs about 14 percent slower than the 486SX-25 class leader overall. The system came with our minimum 2MB of RAM, and unfortunately, CAF filled up all eight RAM sockets with 256K SIMMs. So if you want to install more memory, you'll have to pull at least some of the old RAM, and you'll have to buy extra RAM to replace it.

It appears CAF cut some corners on its graphics accelerator, as the Trident 9000 unit has a minimal 256K of video RAM. The service mix has its lumps as well: The lack of both toll-free central tech support and an on-site service option stuck in our throats. Great price, expandability, and accessibility make this system a pretty fair value. But the top competitors have better support and give you a lot more bang for your buck.

CUI Advantage 486/25SX



VITAL STATISTICS

Street price: \$1207
Processor: i486SX-25
PROS: Excellent service,
expandable
CONS: Mediocre performance
Contact: CUI, 800/458-6686,
408/241-9170
Reader service no. 678

A computer doesn't get too far in *PC World* without solid service backing, and CUI knows how to support its products. Our research tells us that tech support responsiveness and

accuracy are at the top of your list, so we pay attention to time spent on the phone and the answers we get. We got through immediately on GUI's toll-free lines, and the technicians steered us right in every case. GUI charges a reasonable 5 percent of system cost for a year of on-site service, or \$60.35 on the Advantage 486/25SX. If a repair requires a trip to the service center, the company will turn it around in a single day. That kind of care adds up to one of the highest service and support scores here—not bad for a system with a street price of just \$1207.

Unfortunately, this PC is pretty slow, even for a 486SX-25. That was a bit surprising, considering that it has a 256K secondary RAM cache. The Advantage 486/25SX wound up second slowest overall and dead last on the *Harvard Graphics* test. This poor performance hurt the Advantage, dropping it way down in the rankings.

This PC has some intriguing design points. The plastic flat-pack processor is soldered to a circuit board that plugs into the CPU socket. That way, you can still upgrade by extracting the CPU assembly and installing a new processor. The motherboard supports replaceable clocks up to 33 MHz, so you can use an OverDrive as fast as 66 MHz. Expandability is good for a compact box, with six free slots (four 8/16 bit and two 8 bit) and three free drive bays, all of which will accept a removable-media drive.

Accessibility to the motherboard is good, except it's a little hard to get to the memory. If we rated on service alone, the CUI Advantage 486/25SX would have our ringing endorsement, but we think you're better off buying a faster PC.

Dell 425s/L



VITAL STATISTICS

Direct price: \$1299
Processor: 14865X-25
PROS: Excellent service and support, OverDrive for DX2 upgrade
CONS: Priced over \$1250
Contact: Dell, 800/289-3355, 512/338-4400
Reader service no. 679

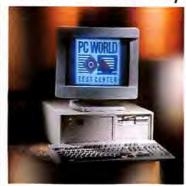
Many buyers won't buy anything but a Dell computer. For them, Dell is an island of stability in an unfriendly sea that's swallowing small and large vendors alike. They don't want to hear about this vendor's speed or that vendor's bargain prices. As far as these folks are concerned, they're not just buying a PC, they're buying the backing of the company that sells it.

Dell sent us its new 425s/L model, with an Intel 486SX-25 CPU, 4MB of RAM, and an 80MB hard disk. This PC might do best hooked up to a LAN, as it has just three 8/16-bit slots for expansion. You can add 128K of secondary memory cache, although none was installed in our test system. You wouldn't know from its performance, however, as the Dell displayed better-than-average speed for a 486SX-25 and a respectable midpack overall showing.

This model has an easy-open case and an innovative modular design. The case bottom and removable peripherals cage is of a light, tough plastic. And the single floppy drive fits in an adapter that snaps in and out of one of two externally accessible bays. Dell was thinking of your future when it put this box together. You can extract the SX CPU and add a 50-MHz OverDrive, or you can move the jumpers and put in a 486DX-33 or even a 66-MHz OverDrive. And to make sure this PC grows with you into the next generation, Dell provided the 238-pin socket for the Pentium-based OverDrive for DX2.

One reason Dell has retained such brand-loyalty is its terrific support, with toll-free lines that have recently gone to 24-hour-a-day, year-round service. Fax, BBS, a year of free on-site service—what more could you ask? This is one of the most upgradable PCs here, although it isn't the fastest. But its buyers won't mind. It's a Dell.

Diamond DT 486DLC/40



VITAL STATISTICS

Direct price: \$1225

Processor: Cyrix 486DLC-40

PROS: Easy to upgrade, 120MB hard drive, good performance

CONS: None

Contact: Diamond Technologies, 800/989-7253, 714/252-1008

Reader service no. 680

After reading this review, you may conclude that Cyrix 486DLC-40 really spells Best Buy, because both systems in the review that use this hot new 40-MHz CPU earned top honors. Both the Diamond DT 486DLC/40 system and the Micro Express ME 486DLC/40 are winners here. You can't draw grand conclusions from such a limited sample, but the results do suggest that the 486DLC-40 offers remarkable value in affordable systems.

The Diamond Technologies system achieves a splendid overall balance. It's fast, making our top ten and even beating out one 486SX-33. And if your application can use a 387 (which is inside every Intel 486 but not in the 486DLC), you'll welcome the Diamond's installed Cyrix FastMath coprocessor. Further adding to the speed, Diamond provided a 256K secondary RAM cache. You get 4MB of RAM and a 120MB hard disk—not bad for a \$1225 economy box. The video system is solid too, and the Western Digital graphics accelerator is loaded up with 1MB of RAM. Diamond sweetened the pot with a free mouse.

If you need a future speed boost, you can replace the system clock and pop an Intel OverDrive CPU into the upgrade socket. There's room to move under the hood, with good access to everything. Six free 8/16-bit slots is generous in a compact box, and all three of the available drive bays are externally accessible.

Diamond's service policies look good too, starting with the 15 months' parts and 24 months' labor warranties. Add on a toll-free tech line, great responsiveness, and solid accuracy; stir in a year of on-site service for \$75 and a two-day turnaround service policy; and you have a solid protection recipe. A quibble? No fax or BBS support and no support on weekends. So what do you get when you cross a hot new processor with a well-designed, well-supported, upgradable PC? A Best Buy, of course.

Introducing PC To Just think of it

PC Tools for Windows

Organize and simplify your work.

Our unique MultiDesk desktop manager lets you put related applications, folders and files into their own separate desktops. Set up as many desktops as you like, then switch between them instantly. It all adds up to a less cluttered, more productive Windows environment that works like you do.

BIKES Budget Font: NewCenturySchibk Blaic) 6 pt Pg 1 Ln 2.08" Pos 1.73" File Manag PC Tools for Windows Doug's Office File Manager Intions Window Help DE File Disk Iree Yiew Options New Windo 67,350 Imploae 13.016 Implode gi_Re.git 19,836 Stored Expand oldstuff arc lotus 123 wk3 2 460 Implode Discrypt H_file.til 154,084 Implox Enclypt 11.351 Implod Virus Scan All Files Programs Documents Tie Copy File Move File Delete File Print File

Doug's Office

Desktop: Budgets

[2]

Improve the speed and efficiency of common tasks.

Our integrated File Manager has advanced drag-and-drop capabilities that let you quickly locate, view, copy and print files. With over 75 viewers, you can scan files (including compressed PKZIP data) without having to open their applications first. Hate to turn off your PC because you don't want to set everything up again? Our DeskSaver feature solves that problem too.





Windows® is a great product. And someday, it'll be even better. But why wait?

New PC Tools™ for Windows® is here right now. It saves you time, reduces clutter and gives you easy access to all the functions and files

you use most often. In fact, PC Tools for Windows is so innovative that after reviewing it, the editors of PC/Computing asked, "Who needs Macs?"

For starters, there's our unique MultiDesk™ desktop. MultiDesk is an intuitive desktop manager that lets you organize your work by creating as many desktops as you need for your projects, tasks, or clients. So, if you spend the day switching between many different projects, you won't lose anything in the clutter.

Ever misplaced a file or couldn't remember its

ols™ for Windows® as Windows 4.0.*



[3] Enhance your system's performance.

System Consultant¹⁷ performs over 400 system checks and provides recommendations for improving your PC's performance. Our Disk Optimizer can automatically defragment your hard disk at prescheduled intervals, or on command.

[4] Automatically protect your data.

We've included new Windows versions of Backup, Undelete, Anti-Virus and DiskFix. They're all integrated in WinShield; an automatic data-protection system that results in worry-free computing. Our Emergency Disk builds a bootable recovery disk to help get a crashed system up and running fast.

name? Our File Manager lets you quickly view files without having to load the program first. Tired of cryptic, abbreviated file names? Now you can attach long file names to your data to keep things clear and simple.

We also created Speed Keys" so you can take shortcuts through Windows, and System Consultant that gives you specific tips for improving system performance.

PC Tools for Windows is at your nearest dealer.

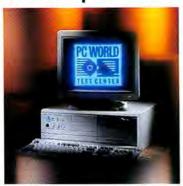
For more information, a free demo disk, or to upgrade from PC Tools for DOS, call us at **1-800-759-1805**. Your purchase is backed by our 60-day guarantee.

Find out for yourself why the editors are already heralding PC Tools for Windows as "The ultimate desktop." It may just be the best thing since, well...Windows.

Central Point Software

mitral Point Software did not collaborate on this product, and this ad is not in any way sponsored by Microsoft PC Tooks for Windows does not replace Microsoft Windows or any future version thereof; it simply complements it important the companies.

First Computer FCS 486SX-33



VITAL STATISTICS

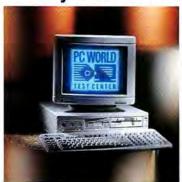
Direct price: \$1199 Processor: i486SX-33 PROS: Very good price, dustprotected keyboard CONS: Sub-par performance for a 486SX-33, no on-site service Contact: First Computer, 800/325-1911, 404/441-1911 Reader service no. 681

The First Computer FCS 486SX-33 comes with a 33-MHz Intel 486SX teamed with a 128K secondary RAM cache-a combo suggestive of both hot performance and a price higher than \$1199. Unfortunately, the FCS 486SX-33's speed didn't live up to expectations. Its overall rating was almost 17 percent slower than the next slowest 33-MHz PC and was surpassed by almost half the 25-MHz 486SXs. That's not what we expect from a 33-MHz machine.

Service and support is very good in most respects: The toll-free support is responsive, and we got flawless advice. Unfortunately, there's no on-site service option with this model.

The FCS 486SX-33 came with just 2MB of RAM. The flat performance is frustrating, because this PC has a lot to recommend it. The full desktop case provides ample expandability in six free slots and three free externally accessible bays. The vendor even threw in a keyboard with a flip-up dust protector. In fact, we fell in love at first sight with this low-cost 33-MHz machine. But its 25-MHz 486SX-class performance did much to cool our ardor.

Gateway 2000 4SX-25



VITAL STATISTICS

Direct price: \$1495 Processor: i486SX-25 PROS: Great software bundle, 170MB hard disk CONS: Priced over \$1250, poor response, no free drive bays Contact: Gateway 2000, 800/846-2000 Reader service no. 682

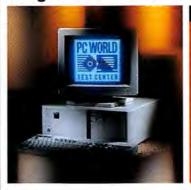
For many, Gateway 2000's name is synonymous with value. Users have purchased Gateway systems in droves, taking advantage of ultra-competitive prices, outstanding design, and super service-including long hours of toll-free support and a year of free on-site service. Ironically, Gateway's fantastic success has thrown a stumbling block in its path. Gateway customers have struggled of late to get through on the company's toll-free service lines. In our own support checks, we found the lines busy more often than not. This poor responsiveness hurt Gateway's usually outstanding service rating.

The handsome, low-profile \$1495 Gateway 2000 4SX-25 didn't make our price point. But the system comes with 4MB of RAM, a

170MB hard disk, Microsoft Windows and Works for Windows, antivirus, disk optimization, and data recovery tools from Central Point's PC Tools 8.0 and Diagsoft's QA Plus. Oh yeah-you also get both standard floppy drives, a mouse, and integrated local bus video with 1MB of DRAM.

There's room for a lot of eards in the five free expansion slots, but all the drive bays are already filled—a problem if you want to add an internal CD ROM or tape drive. Despite its high price compared to the other systems, this PC offers a lot of extras for users who won't need to add more internal drives. Gateway is on a crash program to increase its support staff and phone lines. We're hoping we can report soon that the company has returned to the form that won it our Service Excellence award. [Editor's note: At press time, Gateway told us it no longer offers this PC with a 486SX-25 CPU. The new model is identical in price and features and uses an i486SX-33.]

Insight 486-33 MHz ValueLine



VITAL STATISTICS

Direct price: \$1249 Processor: i486DX-33 PROS: Fast performance on CONS: No on-site service option, limited video resolution Contact: Insight Computers, 800/927-7848, 602/350-1176 Reader service no. 683

Insight's 33-MHz Intel 486DX offering clearly isn't lacking in power-not when it can virtually match the performance of the second-fastest PC in this roundup on the processor-intensive 1-2-3 benchmark and is just 25 percent overall behind the scorching 50-MHz Auva system. The 486DX CPU gives you the advantage of a built-in math coprocessor, and the Aten motherboard comes with 64K of secondary RAM cache installed (expandable to 256K). In addition, Insight provides 4MB of RAM and still manages to squeeze in at a dollar under our \$1250 price point.

All the drive bays in the Insight's case are accessible. With three of those bays free and six free expansion slots, you shouldn't ever find yourself hurting for peripheral or drive capacity. The company bundles a mouse and Dr. Solomon's Anti-Virus and throws in Stacker 2.0 in case you want to use its real-time compression to double your native 80MB hard drive capacity. The video subsystem isn't anything special, however. The graphics accelerator has just 256K of DRAM installed, and the Premier Innovations 41 monitor won't support anything beyond standard 640 by 480 VGA resolution.

Service and support is mostly a positive story. While responsiveness was a little spotty, our questions were answered accurately. Furthermore, the support lines are toll-free and available on weekends. And just before press time, Insight told us it was extending its support hours around the clock. Unfortunately, there's no on-site service option, although the company insists that it does everything it can to mitigate the lack of on-site service by pouring resources into its existing service channels. On balance, this is a pretty solid value-priced computer-especially considering the bundled extras.

IBM

"As the next wave of technology

IBM PCs and IBM people help make it easier to choose a computer for today — and tomorrow.

In fact, tomorrow is just around the corner. It's the brave new world of processing called Pentium $^{\text{TM}}$.

These newest IBM PS/ValuePoint™ PCs are upgradable to an Intel® OverDrive™ processor that will be based on Pentium' technology. So when you're ready to take this big next step, these PCs — along with the personal computing experts at IBM PC Direct™ — will help

you take it in stride.

PS/ValuePoint systems are

available in more than 20,000 configurations; as stand-

alones, servers or medialess clients. Call us and we can customize one for you using

many of today's most popular

Also new and standard: faster local bus video, larger and

faster hard drives, upgradable

memory to 64MB and easier

processor upgradability.

ontions

PS/ValuePoint 425SX/S

\$1,579*

NEW!

IBM Credit Lease \$57/mo.**

4MB RAM, IBM DOS and Microsoft® Windows™ preinstalled

Fast!

- i486™SX/25MHz processor
- · 8KB internal cache
- High Performance SVGA VESA Local Bus Video with 1MB DRAM

Easy Upgrades!

- Expanded processor upgradability via Intel OverDrive technology all the way up to Pentium¹
- · RAM upgrades available

And More:

- . 120MB (15ms) hard drive
- 3.5" 1.44MB diskette drive
- 3 slots (one 32-bit VESA Local Bus), 3 bays
- · IBM enhanced keyboard/mouse
- 6312 SVGA NI 14" color display
- Networkable
- Industry Standard Compatibility

Prices may be even lower! Call us today for the latest quote.



rolls in,
we'll help
you ride it."



angelier P. Horaitia

Angelica Horaitis
Director of Value Brands
IBM Personal Computer Company-NA



IBM PC Direct

We're putting the personal in personal computing.

Call 1 200 IRM-2VOL

1 800 426-2968, refer to: X613PCW1 8am-midnight M-F, EDT; 8am-7pm Sat., EDT



Purchase order is available for qualifying customers.

IBM

PS/ValuePoint 466DX2/T

\$3,609



IBM Credit Lease \$130/mo.** 4MB RAM, IBM DOS and Microsoft Windows preinstalled

\$3,789

IBM Credit Lease \$137/mo.** 8MB RAM, IBM OS/2® preinstalled

Fastest!

- i486 DX2/66MHz processor
- . 8KB internal cache
- . High Performance SVGA VESA Local Bus Video with 1MB DRAM
- Internal i487[™] math coprocessor
- 128KB L2 cache

Easy Upgrades!

- · Pentium' upgradable via Intel OverDrive technology
- · RAM upgrades available

And More...

- . 527MB (9ms) hard drive
- . 3.5" 1.44MB diskette drive
- 8 slots (one 32-bit VESA Local Bus), 6 bays
- IBM enhanced keyboard/mouse
- . 6319 SVGA NI FS 15" color display
- Networkable



Choose from quality components to have IBM PCs personalized for you.

If the systems on these pages don't meet your exact specifications, we'll customize an IBM PS/ValuePoint for you with your choice of...

- Processors
- · Hard Drive
- · Floppy Disk

- Display
- L2 Cache Memory · Video DRAM
- . IBM OS/2 or IBM DOS and Microsoft Windows

And more!

Call us today for a quote.

"One call gets your and your

1. All models are upgradable with intel's future Over Drive processor based on Penhum processor technology. 2. Warranty and 30-day quarantee information available through IEM and IBM Authorized Dealers. Please call 1 800 426-2968 for details regarding IBM's moneyback quarantee and limited warranty are available upon expects. 3 in a read-should be upon expects. 3 in a read-should be upon expects. 3 in a read-should be upon warranty. 4 Available Monatory Finday Bins Spin in your time zone, when serviced by IBM. 1 parts are required, this service is provided after receipt of parts shipped overnight. APPLIES TO IBM PC DIRECT SALES ONLY.



The "PC" in PC Direct stands for personal computers - and a good deal more.

It stands for Personal Commitment. Any time of the day or night, the IBM Personal Systems HelpCenter™ is always available.

It stands for the Personal Care you can count on from professionals: the IBM Service Representatives.

And it stands for the Personal Confidence that comes from knowing you're getting a guibble-free

30-day moneyback guarantee plus one of the best warranties in the

All of which is brought to you by the people who design, build, sell and service more PCs than anyone else. So while you compare how much PC you can get for the price, don't forget to factor the people behind the PCs into the equation, too.

Call IBM PC Direct today. Get to know the PC people you've always been looking for. And who'll always be there for you.

The HelpWare™ Advantage: Guarantees and personal service every step of the way.

30-day moneyback quarantee. No qualms, quibbles or questions asked. If you're not happy, neither

Expert help from PC specialists 24 hours a day. Need help deciding, deciphering and demystifying? Call us and we'll help. We're always here. 24 hours a day. You can also contact us by 24-hour

bulletin board or automated fax, if

Free 1-year onsite service. You send nothing to us, we come to you - with genuine IBM Service - no charge

Fast, genuine IBM Service. If you do need to call us, our own service representatives - not a third-party vendor - will respond. We have over 10,000 service representatives, in more than 1,600 locations nationwide, backed by more than one billion dollars in parts.

IBM Personal Computer Trade-in Program. If you need to replace your current systems give us a call... even if they're not IBM PCs.

IBM Credit Lease. Don't have ready cash to make your purchase? We offer an IBM Credit Lease to qualified commercial customers.

specs, your prices kind of people."

IBM ThinkPad™ 700C

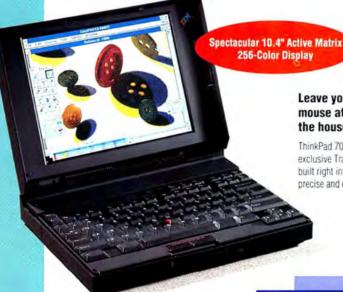
IBM Credit Lease \$153/mo.

- 486SLC™/25MHz processor
- 4MB RAM
- . 120MB removable hard drive
- . 3.5" 1.44MB diskette drive
- . 16KB internal cache
- . 10.4" active matrix 256-color display
- · Full-size keyboard with integrated TrackPoint II™ pointing device
- Advanced Power Management
- IBM DOS, Microsoft Windows and Prodigy®+ preinstalled

IBM ThinkPad 700

IBM Credit Lease \$96/mo. **

- 486SLC/25MHz processor
- 4MB RAM
- . 80MB removable hard drive
- . 3.5" 1.44MB diskette drive
- 16KB internal cache
- Full-size keyboard with integrated TrackPoint II pointing device
- 9.5" mono STN LCD display
- IBM DOS and Prodigy* preinstalled



PC Director of Direct Response Marketing and Customer Support IBM Personal Computer Company-NA

Leave your mouse at the house



ThinkPad 700 series models have the exclusive TrackPoint II cursor control built right into the keyboard. It's smooth, precise and easy to use.

IBM PC Direct

We're putting the personal in personal computing.

1 800 426-2968, refer to: X613PCW1 8am-midnight M-F, EDT; 8am-7pm Sat., EDT.







Purchase order is available for qualifying customers.

Thinking options? May we suggest...

IBM Port Replicator for 700 and 700C \$75 IBM Expansion Unit (docking station) for 700 and 700C \$859 IBM Expansion Cartridge for 700 and 700C \$425 IBM High Speed Internal Data/Fax Modern \$545 (14,400 bps/14,400 bps) for 700 and 700C

IBW

PS/ValuePoint add-ons
PS/ValuePoint displays:

6312 Color Display

6314 Color Display

IBM CD ROM II Drive

T/R Adapter 16/4 AT

T/R Adapter 16/4 II

10 base 2 Ethernet® ISA

LAN Adapter/A Ethernet

LAN Adapter Ethernet

LAN Streamer MCA 32-bit card

10 base T Ethernet AT

IBM 3510 SCSI Enclosure

LAN/Communications:

"They listened, they helped me,

Price

\$379

6312001

6314001

6451104

35100V0

25F7367

03F0215

60G0615

60G0605

92F8942

48G7171

48G7169

\$489

\$215

\$535

\$610

\$140

\$125

FREE IBM PC Direct

You'll find it all and more in the latest edition. From the newest IBM PS/ValuePoint and ThinkPad models, to software peripherals, printers, networking products.

multimedia... anything and everything.

call 1 800 IBM-2YOU and we'll send one 2YOU today.

and made it easier to get everything I needed."

Carla Hemdra

Carla Hendra Customer, IBM PC Direct

We sell personal computing products one person at a time.

What's the one thing you have in common with millions of other computer products buyers?

You're different.

Whether it's hardware, software or peripherals, your needs are almost as unique as your fingerprints. But at IBM PC Direct, the unusual is usual and we pick up the phone ready for anything.

We can sell you just about any add-ons or software you want. In fact, if you don't see an IBM or IBM-compatible product listed in our catalogs—a copy of which is yours for the asking—call us anyway. Chances are we have what you need!

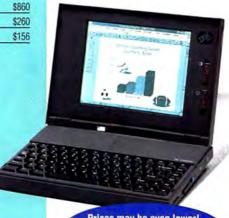
After all, keeping you happy is something we take personally.

6319 Color Display 6319001 \$349 6317 Color Display NEW 6317M01 \$999 Memory: 2MB SIMM (70ns) 6450902 \$130 4MB SIMM (70ns) \$265 6450128 8MB SIMM (70ns) 6450130 16MB SIMM (70ns) 60G1622 \$1,195 1MB DRAM KIT(PS/ValuePoint graphics) 60G1623 \$72 IBM 245MB AT Hard Drive (IDE) NEW 32G4194 \$539 IBM 340MB AT Hard Drive (IDE) NEW 32G4195 \$719 IBM 527MB AT Hard Drive (IDE) NEW \$1,079 32G4196 IBM 1.0GB SCSI Hard Drive NEW 6451052 \$2,279 IBM 3.5" Enhanced Rewritable Optical Drive 6451295 \$1,499 IBM 16-bit ATFast SCSI Adapter (internal) NEW 32G4088 \$205

IBM ThinkPad 300 \$1,699*

BM Credit Lease \$62/mo.**

- 386SL/25MHz processor
- 4MB RAM
- . 80MB hard drive
- 9.5" mono STN LCD display
- 3.5" 1.44MB diskette drive
- 64 KB external cache
- 82 keys with embedded numeric keypad
- Power management features
- · IBM DOS preinstalled



Prices may be even lower! Call us today for the latest quote.

"SM prices only. The offerings prices and products are subject to change or withdrawal without prior notice. Products you acquire may not be counted under any existing Volume Purchase Agreement. The same offerings and products may be available through IBM Authorized Remarkers. Remailable prices may vary. Shipping and franding changes are enta. ""IBM Circl 4 Lease prices gooded are for 36-month terms. Lease raises guarded are good mitouth 6/30-30, after which time rates are support to change which notice. Lease available to qualified continence outsterness only. IFFDIOIG will not run without a modern. A modern in soil or Loude with the Thinkips 2700 or 700. At a notice in the Authority of 700 and 300 systems and options are manufactured in Japan. PSY/alse/Port 6312, 6314 and 6319 Color Displays are manufactured in Navience. The PSY/alse/Port 6317 Color Displays is manufactured in Navience. The PSY/alse/Port 6317 Color Displays are manufactured in Navience. The PSY/alse/Port 6317 Color Displays are manufactured in Navience. The PSY/alse/Port 6317 Color Displays are manufactured in Navience. The PSY/alse/Port 6317 Color Displays are manufactured in Navience. The PSY/alse/Port 6317 Color Displays are manufactured in Navience. The PSY/alse/Port 6317 Color Displays are manufactured in Navience. The PSY/alse/Port 6317 Color Displays are manufactured in Navience. The PSY/alse/Port 6317 Color Displays in manufactured in Navience. The PSY/alse/Port 6317 Color Displays in manufactured in Navience. The PSY/alse/Port 6317 Color Displays in manufactured in Navience. The PSY/alse/Port 6317 Color Displays in manufactured in Navience (PSY/alse/Port 6317 Color Displays are manufactured in Navience (PSY/alse/Port 63

IBM PC Direct

We're putting the personal in personal computing.

Call 1 800 IBM-2YOU

1 800 426-2968, refer to: X613PCW1 8am-midnight M-F, EDT; 8am-7pm Sat., EDT.

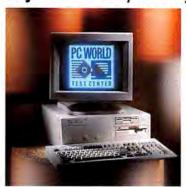






Purchase order is available for qualifying customers.

Keydata 486SX/25 Keystation



VITAL STATISTICS

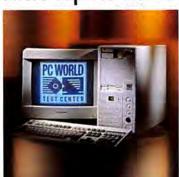
Direct price: \$1245 Processor: i486SX-25 PROS: Good service and support CONS: Limited expandability 800/486-4800, 908/755-0350 Reader service no. 684

We'll say right up front that the Keydata 486SX/25 Keystation is a really good value, with all the desktop essentials. You get 4MB of RAM, a 256K secondary RAM cache, and both standard floppy drives. In addition, the company combined a Cirrus Logic graphics accelerator with 512K of DRAM and a noninterlaced Korea Data Systems monitor to produce a top-notch video subsystem.

The 486SX/25 Keystation has plenty of peripheral potential in five free expansion slots. There's only one free drive bay, but it's externally accessible. In terms of performance, the Keystation beat all the other 486SX-25 systems on the Harvard Graphics and Paradox tests—and on Harvard Graphics it even outdistanced three 33-MHz systems. The 25-MHz Intel 486SX CPU is hardwired—but onto a circuit board that plugs into the CPU socket. This approach allows the company to minimize costs and still leaves you with an upgrade path. If you replace the 25-MHz oscillator with a clock that ticks at 33 MHz, you can upgrade all the way to a 66-MHz OverDrive.

Keydata's service and support prescription should make it easy to maintain a healthy PC. It starts with an 18-month parts and labor warranty and a year of free on-site service. On top of that, the tollfree tech line connects to responsive technical support reps. Keydata doesn't have a BBS but will fax you support documentation. If you're looking for a fast 486SX-25 system with a fine video setup, this Keystation could be just what the doctor ordered.

Micro Express ME 486DLC/40



VITAL STATISTICS

Direct price: \$1150 Processor: Cyrix 486DLC-40 PROS: Great price, service, and performance **CONS:** None







right on the mark! Overall, this is the best low-cost PC we've ever

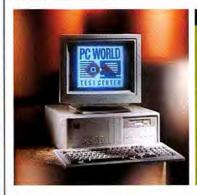
Say something good about this machine. Go ahead. And while you're at it, heap on a bunch of superlatives-chances are you'll be

reviewed-bar none. Let's start with the fiery new 40-MHz Cyrix 486DLC processor, designed for use in affordable PCs like this one. Cyrix seems to have hit a home run with this CPU-it delivers just the right combination of speed and economy to score big at this price point. Speaking of economy, Micro Express has really managed to deliver the goods. Is a \$1150 direct price with 4MB of RAM, 128K of secondary RAM cache, and a 512K caching IDE disk controller affordable enough for you? The half-size tower design leaves a generous four drive positions free, three of which are externally accessible. And if you like to add in peripherals, this system's five free slots will oblige.

Micro Express recognized that even buyers of an inexpensive Cyrix-based PC would want to keep the path open to Intel's attractive OverDrive upgrade. So the motherboard has a replaceable system clock and an upgrade socket that will accept Intel OverDrive CPUs. This PC is so fast, however, that you'll probably love it just the way it is. It took a 50-MHz Intel 486DX to unseat the ME 486DLC/40 from first place in overall performance. But the Micro Express nailed top position on the WordPerfect and Harvard Graphics tests and came in fourth on Paradox. The caching controller gave the ME 486DLC/40 an extra edge in our performance suite, as we test without disk caching software installed. Loading a software cache with some of the other fast systems would make the Micro Express machine's performance seem somewhat less transcendental, but any way you slice it, this is a hot PC.

We've saved the best course for last: Micro Express service earned the top rating in the review. How? Well, try making a tollfree support call at midnight on Christmas Eve if you want to find out. Does that mean 24-hour, year-round tech support? You bet. And you won't give up responsiveness or accuracy. You get a twoyear parts and labor warranty, and a year of on-site service costs a reasonable \$50. Two-day turnaround and fax support more than make up for the lack of a BBS. That brings us right back where we started: This Best Buy PC is an easy winner in every category.

MIS 425SX



VITAL STATISTICS

Direct price: \$1279 Processor: i486SX-25 PROS: Fine service and support CONS: Poor graphics resolution Contact: MicroNiche Information Systems, 800/733-9188, 408/730-9188 Reader service no. 686

We love it when products cluster near the top of a category in our reviews because it means you have an abundance of value to choose from. That's how this month's service section looks: The top seven positions are packed as tightly as a bunch of bananas, and MIS is right in the group. They all have a one-day-turnaround service policy, and our probe of toll-free central support yielded immediate response and accurate answers. If you want on-site service, it will cost you a mere \$45 for the first year, and fax support is free. The only demerits come from the lack of weekend and BBS support.

The system's average performance is exactly what you'd expect from a 25-MHz 486SX—adequate for a starter PC. The MIS 425SX's hardwired 25-MHz Intel 486SX CPU is soldered in place, a move that cuts costs. To make sure you're not facing premature obsolescence, the motherboard also has an upgrade socket. Drop in an OverDrive CPU, and you're cranking along at a clock-doubled 50 MHz. MIS installed no secondary RAM cache, but the system has the capacity for 256K, and the slot for the cache card makes the cache upgrade one of the easiest in this review.

You can access everything you need to inside the case very easily. There's plenty of room for peripherals in six slots, and each of the three free drive bays can hold a removable-media drive. MIS supplied a vanilla video setup, however: There's only 256K of DRAM on the Cirrus Logic accelerator, and the ViewSonie 1 monitor is capable of only standard 640 by 480 VGA display. To its credit, the monitor supports noninterlaced output at that resolution. There's nothing about the MIS system that will boost it to stardom, but it is a solid value. And its vendor's service policies make the company worthy of your attention.

Netis N425VL



VITAL STATISTICS

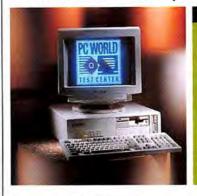
Direct price: \$1025
Processor: i486SX-25
PROS: Best price in roundup, two free local bus slots
CONS: No toll-free technical support
Contact: Netis Technology,
408/263-0368
Reader service no. 687

The Netis N425VL is a system that will grab the bargain hunter's attention. Where else can you find an Intel 486SX-25 with 4MB of RAM, a 64K secondary RAM cache, and an 80MB hard disk for \$1025? If that sounds good, you also get a motherboard with two local bus slots.

As with the Key Data system in this review, the CPU is soldered onto a module that plugs into the CPU socket. You get two free VESA local bus slots, although Netis supplied a 16-bit Acumos SVGA card. In addition, the motherboard provides four free 8/16-bit slots and two free 8-bit slots. All three free drive bays support drives you can access from the outside of the ease.

When it comes to getting around inside the desktop case, your access to the CPU is slightly pinched, and the secondary memory cache is placed beneath the drive cage. Even though the internal appearance is cluttered, however, you can reach the memory fairly easily. The service and support scores were good overall, with a two-day turnaround policy and BBS, fax, and Saturday support. Calls were answered right away and accurately. You have to pay the toll on your support calls, however—pretty tough if you're calling this Sunnyvale, California, vendor from New York. And the on-site service is \$100 for a year. But with a buy-in as low as \$1025, this PC still shines as a good value and a bargain hunter's dream.

Packard Bell PB425/8



VITAL STATISTICS

Processor: 1486SX-25
PROS: 8MB of RAM, 245MB
hard disk, free software
CONS: Poor support responsiveness, priced over \$1250
Contact: Packard Bell,
818/886-9998
Reader service no. 688

The Packard Bell PB425/8 is a one-stop shop for the entry-level buyer. It's loaded up with Windows, Packard Bell's version of 1-2-3 for Windows, and Lotus Write for Windows. The system is Windows-optimized with 8MB of RAM, two floppy drives, and a huge, 245MB hard disk. You even get an internal modem with this PC—that's pretty impressive, considering it missed our price point by less than \$50.

Performance is good for a 25-MHz 486SX, helped by a 128K secondary RAM cache to a finish near the median overall. And the PB425/8 managed to tie two 33-MHz PCs for third place on the WordPerfect test. The one free drive bay is externally accessible, and all four expansion slots are free.

The one place where Packard Bell stumbled is service and support. You wouldn't know it by the policies: Calls are toll-free and available 24 hours a day, seven days a week. Packard Bell provides fax and BBS support, and you don't pay a dime for a year of on-site service. There's a support line for dealers, although you're not likely to get support from many of the discount outlets selling Packard Bells. Our main problem was getting through when we called. We dealt with one unanswered call and two recordings asking us to call back between 10 p.m. and 5 a.m. In addition, some of the advice we got didn't solve our problems. The poor responsiveness and accuracy dragged down service scores that would have otherwise been good, and the overall rating of the machine suffered. That's too bad, because this system offers an extremely attractive bundle of extras that represents a hidden savings of hundreds of dollars.

Affordable 486 Prices Stabilize

This is the eleventh time we've run a system review that includes late list price information we researched just before going to press. Last summer and fall, prices plunged so radically it was hard to tally the changes. Now, however, costs seem to have leveled—at least for the moment. In fact, these affordable 486s had the smallest two-month price movement we've seen in the last year. The Blackship BLK 486DX/33 LB's direct price dropped \$55 to \$1195, making this Best Buy an even better value. And the least expensive 486 in our review—the Netis Technology N425VL—dipped \$50, breaking the \$1000 barrier at \$975. Finally, Quill Computer Products trimmed \$50 off the price of its Qtech PCS-4S25, which you can now buy for \$1049.

WHY OKIDATA RE-INVENTED THE LASER PRINTER.



Conventional laser printers rely on a multi-part system of moving laser beams, rotating mirrors and focusing lenses to create each page of output. Sound complicated? It is. That's why Okidata engineers replaced it with a solid-state LED printhead producing 2,560 precise points of light.

Okidata's no-moving-parts printhead comes with a 5-year warranty – the industry's longest. But it's only one reason to choose the Okidata OL400 4 ppm printer for professional-quality

THE output in any home or small business application.

The OL400 also comes with
17 resident fonts, full compatibility
with all major software, and a 200-sheet
paper tray. You can add extra fonts, extra
memory, even specialty paper trays.

Most important, the OL400 offers the legendary Okidata reliability that makes it one of today's best entry-level printer values. All of which means buying your first page printer doesn't have to be complicated. Not since Okidata made it simple.

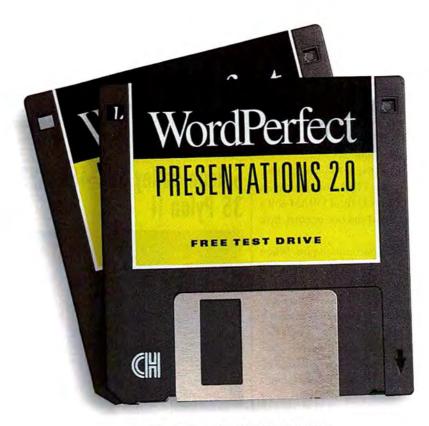
CALL 1-800-OKI-TEAM EXT. 203 FOR THE DEALER NEAREST YOU

FOR THOSE WHO BELIEVE ADVERTISING.

Dynamic, Windows-like Graphical User Interface (DOS has never before been this GUI)! Master Gallery of professionally designed slide templates to get you started quickly! Is Intuitive Button Bars to flatten your learning curve! Is Powerful Outliner to help you organize your thoughts! 188 The only presentations package with both draw and paint tools! F Mindblowing digital audio capabilities (with the appropriate hardware, record and playback WAV and VOC files)! Fasy pie, bullet, surface, area, scatter, hi-lo, bar, organization and other charts, many in 3-D! For Split-screen chart editor! The 256-color palettes customizable from a universe of more than 16 million colors! use Dazzling special effects like contoured text, blending and shadows! F A library of over 100 MIDI music files (classical, jazz, country, pop, new age and more)! Somethan 1,000 clip art images to work with! see Supports more than 20 popular sound cards! see Import scanned images! Edit bitmaps pixel-by-pixel! Exclusive Autotrace feature that converts bitmaps to vector-based images! For Diagonals, overlays, screen pours, on-screen highlighting and more for exciting on-screen transitions! 18 Unique DOS Slide Sorter-just click and drag to rearrange! Automatically generated handouts and speaker's notes! The industry's best toll-free customer support in the U.S. and Canada! [33] And that's just the beginning!

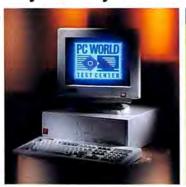


FOR THOSE WHO DON'T.



Try it free. Call (800) 526-5058.

Polywell Poly 486-33V



VITAL STATISTICS

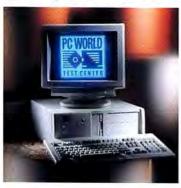
Direct price: \$1250 Processor: 486SX-33 PROS: Fast; five-year labor warranty; OverDrive for DX2 socket CONS: 60MB hard disk Contact: Polywell Computers, 800/999-1278, 415/583-7222 Reader service no. 689

The Poly 486-33V is value enough to barely miss a Best Buy. It hit our price right on the nose while providing 4MB of RAM, a 128K secondary RAM cache, local bus video and drive controllers, and a 238-pin Intel ZIF socket that will accept Intel's projected Over-Drive for DX2. The drawback edging it out of the winner's circle was a 60MB hard disk-within our minimum guidelines, but the smallest here. This 33-MHz Intel 486SX's performance missed the fastest five overall by a single percentage point.

The system has two local bus slots and five 8/16-bit slots. This configuration leaves four slots free, with the VESA slots filled by an Orchid local bus graphics accelerator with 1MB of DRAM and a local bus drive controller card. Two external and one internal drive bays remain free.

Polywell service and support offers an uncommon plus. When your one-year parts and labor warranty runs out, the company will provide free repair and labor for four additional years. If you need on-site service, you can buy a year for \$75. The six-day-a-week technical support is responsive and accurate. Fax support rounds out the service picture. As we said, this system missed a Best Buy by a whisker in a review that's so packed with great deals it gives new meaning to the phrase "no room at the top." Any way you look at it, this is a superb PC. The only thing keeping it from being a super Windows machine is its small 60MB hard disk.

Quill Otech PCS-4S25



VITAL STATISTICS

Direct price: \$1099 Processor: i486SX-25 PROS: Excellent price CONS: Mediocre performance, no toll-free support Contact: Quill Computer Products, 708/634-6650 Reader service no. 690

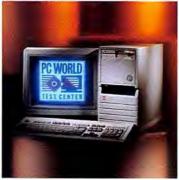
Misers take note: The Quill Qtech PCS-4S25-2 combines an Intel 486SX-25, 4MB of RAM, and an 80MB hard disk-and serves it up for under \$1100. And of the 25 systems we reviewed here, only the Netis Technology N425VL system costs less. The system comes housed in a handsome compact case that gives you three unfilled drive bays, all of which are externally accessible.

The system has six free slots (three 8 bit and three 8/16 bit) and will support any of the current Intel OverDrive CPUs—all the way up to 66 MHz if you swap out the current system clock for a 33-MHz oscillator. One important caution before you put on the pressure it takes to seat a new CPU, however: The end of the motherboard under the upgrade socket is unsupported. Better brace it-or chance cracking the system board.

The possibilities of a buyer wanting to upgrade quickly are strong. This system was slow in our tests, uncomfortably close to the bottom overall and last on the WordPerfect test. We suspect that the absence of secondary memory caching has something to do with this lackluster showing. Unfortunately, there's no provision for a RAM cache upgrade.

If you value longevity, Quill is a company that's been selling business products since 1956. The two-day turnaround policy, year of free on-site service, and BBS and fax support are great. And we received good advice, although we had to wait 2 to 3 hours for some callbacks. Our main complaint is the absence of toll-free support lines. The Quill Qtech PCS-4S25 isn't a bad system, although it's not a wise choice for those who value top performance.

Silicon Valley SVC 486SX/33 35 Pylon II



VITAL STATISTICS

Street price: \$1215 Processor: 1486SX-33 PROS: Fast; two-year warranty CONS: Conditional service and Contact: Silicon Valley Computer, 415/967-1100 Reader service no. 691

The Silicon Valley SVC 486SX/33 35 Pylon II is a speedy machine at a tempting \$1215 price. You get a 33-MHz Intel 486SX with 4MB of RAM and an 80MB hard disk. That's not bad, considering that this system zipped past five of the other seven 33-MHz 486s to finish in a virtual tie for fourth on the Harvard Graphics test.

The minitower unit has three externally accessible bays free. The baby motherboard provides six free slots and supports OverDrive processors to 66 MHz.

Everything sounds great so far, right? Great speed, attractive price-if only service and support could match the rest of the package. Don't get us wrong: There's nothing wrong with the two-year warranty. But Silicon Valley's central end-user support is available only to users who buy direct. Silicon Valley provides dealers with a dedicated support line, but it doesn't require training or keeping an inventory of parts in stock. The company recently added an on-site service option for \$99 a year and has a very slow service turnaround of a week or longer. As a system manufacturer, SVC obviously knows what it's doing, but it needs to add just a little more polish to its service and support to match up to our Best Buys.

Hassled by Medical Claims?

Simplify your life with *Med\$ure*; Your Health Insurance Manager." Helps you *file and track* claims painlessly.

MEDSURE DOES IN MINUTES WHAT TAKES YOU HOURS.

It will take a bill from your doctor or drug store, and turn it into an insurance claim you can print and mail in minutes.

Med\$ure will track the claims you've filed from initial bill to final payment. It will resubmit claims to secondary carriers, and flag all unresolved claims until you are satisfied.

SAVE MONEY WITH MEDSURE.

Know how much money you are spending on health care, including premiums and out-of-pocket costs. Spot duplicate or over payments. See where you are in deductible and coinsurance. Learn how to handle rejected claims to recoup the money you are owed.

CHOOSE PLANS WISELY.

Med\$ure will systematically compare any number of health insurance plans based on your unique family profile. When both spouses work, Med\$ure will choose the best option for each. Something only a computer could do.

YOU CAN TRUST MEDSURE.

Med\$ure is award winning software that has saved time and money for thousands of users.





Home Office

PC Magazine (Jan. 14, 1992) voted MedSure "Best of 1991 Honorable Mention." They said, "It has a clean, modern, coherent interface with mouse support and lots of intelligence." PC Computing (Apr. 1992) says "The program is an excellent tool for organizing medical records, with cost savings that could easily recoup its \$89.95 list price." Home Office Computing (Dec. 1992) rated Med\$ure 3½ stars (out of 4). They said "Despite the sophistication of the subject matter, the program is remarkably easy to use. So easy, in fact, that I navigated the entire package with online help, never once opening the 95 page manual.'

Specifications: Prints HCFA 1500 Form, 100% IBM Compatible, 512K RAM, DOS 2.11. Supports Microsoft Mouse



Praise Med\$ure:

"I've got 5 kids. Most are grown now, but I really could have used Med\$ure when they were young.' Lon Lee, Spokane, WA

"First time I used Med\$ure, it found a \$228 claim that had been paid by both me and the insurance company. After calling the hospital accounting office, I got a refund John Michl, Omaha, NE

"I'm very impressed! Looks like I'll finally be able to manage a mountain of claims." Willafay McKenna Williamsburg, VA

"Exactly what I needed. In fact, it has much more than I expected. George Burt, Lomita, CA

"Fits a need like nothing I've seen! (And I've seen a lot.) Thanks.' Dan Arnold, Van Wert, OH

"Med\$ure has surely unscrambled my Medicare mess.

Harvey Metzler, Greenfield, MA

ORGANIZE AND TRACK A **FAMILY OR SMALL BUSINESS.**

Med\$ure will organize and doggedly follow an almost unlimited number of claims. It will track multiple policies for your entire family or for your employees. It will coordinate benefits if more than one spouse carries insurance. It will track Medicare and Medi-Gap payments for you or your parents. It will produce an annual summary of your health care costs, by family member, for tax purposes.

100% MONEY BACK GUARANTEE.

If you are not satisfied for any reason, simply return it in 60 days for a full refund, no questions asked.

SPECIAL OFFER \$69.95

Normally \$89.95

PLUS FREE BONUS!

Order Now and get Claim Forms Starter Kit. (Includes 20 claim forms - Standard HCFA 1500)

YES, send me MedSure for \$69.95 Plus \$5.00 shipping in U.S.

Indicate Preference:

☐ Laser ☐ Tractor Feed SEND TO: Time Solutions®

45 Kellers Farm Rd. Easton, CT 06612

State/Zip ___

Daytime Phone ____

☐ VISA ☐ MasterCard ☐ Check Enclosed

Card Number ___

Exp. Date __

Signature X _

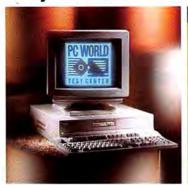
Call 800-552-3302 To Order

or Fax to (203) 268-1812

TIME SOLUTIONS personal software (203) 459-0303

PCWAAP

Tandy 425 SX



VITAL STATISTICS

Street price: \$1324

Processor: i4865X-25

PROS: Widespread, accessible dealer network

CONS: Mediocre performance, no toll-free central support

Contact: Your local Radio
Shack store or dealer

Reader service no. 692

Many buyers depend on hands-on access when they make a PC purchase, and they want to discuss any problems in person. Tandy has always appealed to that kind of buyer. Purchasing a Tandy system is as convenient as a visit to a local Radio Shack, and the company's longevity promotes buyer confidence. Tandy started a factory-direct program last fall to augment its carryout sales. You work with a Radio Shack representative in the store to configure your system. The rep phones in the order, Tandy custom-configures your PC, and you get the system within five business days.

The low-profile Tandy 425 SX came in at \$1324—over our target price—although the company threw in *Windows* and a mouse. If you use *Windows*, however, spend the extra \$45 it takes to bump the 2MB of RAM up to 4MB. Tandy didn't fill the sockets, but there's space for 256K of secondary RAM cache next to the soldered-down 486SX-25 and upgrade socket. A 128K cache would add \$69 to the price, but this PC could use the boost, as the Tandy was second to last or last on every benchmark: Accessibility to the five free slots and two free externally accessible bays is good.

Tandy gives depot service where you bought your PC but doesn't require dedicated staff. On-site service runs \$129 for the first year. When we called central tech support, we experienced long waits—frustrating when the call is on our dime. Tandy is a solid company, but you can get better performance and service elsewhere.

USA Flex 486SX/25



VITAL STATISTICS

Direct price: \$1249
Processor: 1486SX-25
PROS: Excellent service and support, local bus video and drive control
CONS: None
Contact: USA Flex,
800/846-0002, 708/351-9700
Reader service no. 693

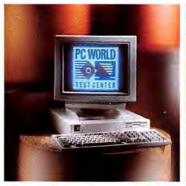
From experience, we expect USA Flex to come up with good, innovative PCs. But in the area of service and support, high expectation has turned into certainty. With that in mind, we're pleased to report that USA Flex has put together another Best Buy combo with its USA Flex 486SX/25. The

machine is good-and service and support is better than ever.

USA Flex put together a cunning blend of new-age components to enhance performance, such as a motherboard with two VESA slots, a hot local bus graphics accelerator, and a 32-bit drive controller. Performance on our disk-intensive *Paradox* test bears witness to the controller's success: Only two other 486SX-25s did better. With a 66-MHz OverDrive upgrade path available, these enhancements guard against obsolescence. USA Flex provided 4MB of RAM, a 256K secondary RAM cache, *Windows*, and a mouse. The compact case accommodates four free accessible drive bays, and the motherboard provides six free slots.

As we said at the outset, USA Flex service and support are great. Responding to your need for protection in a changing market, we recently tightened our already tough service ratings. USA Flex ran our new gauntlet unscathed, right on the heels of the top-rated Micro Express. USA Flex also has responsive 24-hour year-round toll-free support. If your problem can't be handled on the phone, an on-site service rep will visit you free for the first year. BBS and fax support round out the service lineup. When we planned this low-cost roundup, we expected to get nothing *but* 486SX-25s for review. Even after checking out the Best Buy USA Flex 486SX/25's powerful competition, we've decided we'd still be happy to get this one.

Xinetron X/LAN Station 486SX



VITAL STATISTICS

Direct price: \$1249
Processor: i486SX-20
PROS: LAN port, 3-year warranty
CONS: Mediocre 486SX-20
performance
Contact: Xinetron,
800/345-4415, 408/727-5509
Reader service no. 694

The handsome, super-slimline Xinetron X/LAN Station 486SX is a plug-and-play LAN client, ready to connect and configure right out of the box. Ours came with an ethernet option, which handles either Coaxial Thinnet or 10Base-T, and Xinetron also offers an Arenet option. Both of these LAN cards fit the Xinetron's special slot-saving motherboard connector. The system provides four free horizontal card positions. Xinetron did well to fit four bays into this tiny package, leaving both an externally accessible and an internal bay free. You can't install a 5%-inch floppy drive in this PC, however, as all the bays are 3½-inch form factor.

In its quest for ultimate versatility, Xinetron's motherboard can handle everything from a 386DX through a 66-MHz 486 OverDrive CPU and Intel, Cyrix, and Weitek math coprocessors. Because of this machine's 20-MHz 486SX, it's a relatively pedestrian performer, winding up close to the bottom overall.

The warranty is an outstanding three years, technical support is toll-free, and Xinetron offers both BBS and fax support. By the time you read this article, Xinetron will have finalized pricing on an on-site service option. The Xinetron entry isn't a bad network workstation, but for our money, it needs a faster processor.

New Cx486DLC-40, i486SX-33 Almost Match i486DX-50!

	WordPerfect 5.1	1-2-3 3.1	Harvard Graphics 3.0	Paradox 3.5
Auva 486DX/50 Model S10 (Intel 486DX-50)	149	158	282	319
Micro Express ME 486DLC/40* (Cx486DLC-40)	122	238	244	350
Acma 486SX-33 VESA* (Intel 486SX-33)	157	212	307	337
Blackship BLK 486DX/33 LB* (Intel 486DX-33)	170	200	315	383
ATronics ATI-486SX/33 (Intel 486SX-33)	177	217	304	349
Polywell Poly 486-33V (Intel 486SX-33)	157	210	312	434
Silicon Valley SVC 486SX/33 35 Pylon II (Intel 486SX-33)	170	223	305	376
ATS 486-33 (Intel 486DX-33)	178	210	362	386
Insight 486-33 MHz ValueLine (Intel 486DX-33)	173	202	341	438
Diamond DT 486DLC/40* (Cx486DLC-40)	185	236	311	494
Packard Bell PB425/8 (Intel 486SX-25)	157	259	410	454
AST Bravo 4/25s (Intel 486SX-25)	171	267	349	452
Keydata 486SX/25 Keystation (Intel 486SX-25)	184	264	339	439
Netis N425VL (Intel 486SX-25)	185	263	358	443
Dell 425s/L (Intel 486SX-25)	177	264	349	492
USA Flex 486SX/25* (Intel 486SX-25)	196	267	399	448
First Computer FCS 486SX-33 (Intel 486SX-33)	201	242	370	528
MIS 425SX (Intel 486SX-25)	195	272	378	472
Gateway 2000 4SX-25 (Intel 486SX-25)	182	286	440	505
CAF Gold 3D (Intel 486SX-25)	206	281	410	509
ALR Flyer SD 4/25s Model 80DW (Intel 486SX-25)	202	307	370	540
Xinetron X/LAN Station 486SX (Intel 486SX-20)	211	285	452	534
Quill Qtech PCS-4S25 (Intel 486SX-25)	223	289	410	534
CUI Advantage 486/25SX (Intel 486SX-25)	202	276	647	475
Tandy 425 SX (Intel 486SX-25)	213	305	456	552

*Best Buy

Systems are arranged in order of overall speed, from fastest at top to slowest at bottom.

All tests results in seconds.

Methodology

We asked vendors to send us a 486 system with at least 2MB of RAM, one floppy drive, a 60MB hard drive, a VGA controller with color monitor, a keyboard, and DOS 5.0. We configured all our applications for standard VGA mode (640 by 480 pixels at 16 colors for graphical applications and 80 columns by 25 lines for text-mode applications).

WordPerfect 5.1

We start with a simple memo, employ a variety of common formatting features, add several pages of text, and print the result. Then we load a large formatted document and add a graphic. We preview the result several times and print the document.

1-2-3 3.1

We use several worksheets and recalculate each several times based on different assumptions, starting with a variable-rate mortgage projection. Using a series of worksheets, we examine a budget model and create several charts and a summary. Finally, we print and save the altered worksheets.

Harvard Graphics 3.0

We launch a script to create a series of slides based mostly on prepared spreadsheets. We include a title page with an embedded graphic, a series of charts, and a table of data. After previewing the entire presentation, we print it.

Paradox 3.5

To exercise Paradox's relational capabilities, we post several transactions to an order-entry database (which includes several linked tables). We perform a series of queries and print a set of mailing labels.

Data based on tests designed and conducted by the PC World Test Center. Testing performed by Susan Silvius and Ulrike Diehlmann. All rights reserved.

Nobody has eve into a laser pri



MicroArt Printing.

size paper tray.

r piled so much nter for so little.

With a personal laser printer under \$1,000, you normally have to give up one thing for another. Like speed. Or print quality. Or flexible paper handling.

Well, the new Epson® ActionLaser™ 1000 is way under \$1,000. And as you can see from the large stack on the left, we've piled more into it than any other printer in its price range.

Like speed, for example. We clock in at 6 pages per minute, compared with a slow 4 pages per minute for the leading laser in the same price range.

Then there's print quality. Our blacks are blacker and our lines print finer, thanks to Epson's exclusive MicroArt Printing.

If you're really a stickler for sharpness, you can spend a little more (but still less than \$1,000!) for our ActionLaser 1500, with Epson's RITech resolution improvement technology. As well as 13 scalable fonts.

Add a 150-sheet paper tray that handles multiple paper sizes including envelopes, and you can see why Epson laser printers win industry award after award.

Now for the things you can't see. Our



ActionLasers have a two-year warranty instead of the typical one year. Plus the toll-free Epson Connection hotline to answer your questions.

Only Epson gives you so much, for so little.

Even our booklet, "What You Should Know Before Buying a Laser Printer," is absolutely free. To send for it, San KNOW BUTTEN LASER PLANE LASER PLANE LASER PLANE PL





*IntelWelds Boar's Assumer Seal was assuid to the Epon ETL-800 on September 14, 1992 PC Welds "Feet Boa" was assuided to the Epon Ann observed In April, 1992 and the ETL-750 on December, 1991.
All company include product names are trademarks and/or reported trademarks refer manufactures. Epon as registered trademark of Seisur Epon Octy. 1993 Epon Announced Town Assurance April 1992 Announced Town Assurance Assu

FEATURES COMPARISON

All This for as Little as \$1025? Believe It!

BEST BUY	7 0.	P P.	P\ P.	p.\ p.	2 2 2 7	BEST BUY	8 6	ORE	2\ R	2\	
• Yes	Cma DA	ALR FAN	AST Bravo	486-33	Model Sto	Wa KA	Gold 30	Age 1255X	CIII 4255/	=	
O No	13 \ r	TAN .	Tang be	16. 3	25.	S 6	SHIP	2 / 25.	4 /		
n/a = not applicable	SD 4/25-	8	1	Altonics 33	10	0	¥3	/2	•		
d lot opposit	\$	ALR FIVE BOOM					Blackship 33 18		1		
andard features	\		\	\		\	,	\			
Selling price as of 2/2/93 ¹	\$1249	\$1198 ²	\$1450 ²	\$1295	\$1300 ³	\$1299	\$1250	\$1195	\$1207	\$1299	13
CPU	i486SX-33	1486SX-25	i486SX-25	i486SX-33	1486DX-33	i486DX-50	i486DX-33	i486SX-25	i486SX-25	i486SX-25	
RAM installed/capacity (MB)	4/32	2/16	4/64	4/64	4/32	4/32	4/64	2/32	2/32	4/64	
Secondary RAM cache installed/maximum (K)	128/256	0/0	0/256	256/256	256/256	256/256	64/1024	64/256	256/256	0/128	
Number of floppy drives	1	1	1	1	1	2	2	1	1	1	
Hard disk	Conner	Conner	WD Caviar	A STATE OF THE PARTY OF THE PAR	WD Caviar	Quantum	Quantum	Conner	Maxtor	Quantum	
	CP30084E		The second second	CP30084E	The second second	ProDrive	ProDrive	CP30084E		ProDrive	1
Hard disk size (MB)	80	80	120	80	120	80	80	80	80	80	
Motherboard manufacturer	Impression	ALR	AST	ATI	Amptron	Auva	Blackship	CAF	CUI	Dell	
O	Diamond	WDC	Cirrus	VGA	Diamond	Trident	Trident	Trident	Oak	S3	
Graphics controller	Diamond Stealth	WUG	Logic	Mentor	Speedstar	Illuenc	JAX-8212	9000	Technologies		
	24 VLB	- T			24X				1	7-2-1	
Graphics adapter memory	1MB	512K	1MB	512K	1MB	512K	1MB	256K	512K	512K	
Monitor	Mag	ALR	AST SVGA-	CTX CVP-	Shamrock	Samtron	KFC	Tatung	Goldstar	Dell	
	LX1460	TE1420	NI N461D	5468A	SRC 1452	SC-431VII		SVGA	1460 SVGA	DLT439	
			CALIFORNIA DE								-
pandability		1				1	1	1			-
Free 32/16/8-bit expansion slots	0/5/1	0/3/0	0/4/0	0/5/1	0/6/0	0/4/1	0/6/0	0/4/1	0/4/2	0/3/0	+
VESA local bus slots/number free T	2/1	0	0	0	0	0	2/2	0	0	0	+
Externally accessible 3½-inch/5¼-inch drive bays	1/3	1/1	0/2	2/2	2/3	1/3	2/2	2/3	1/3	0/2	+
Internal 3½-inch/5¼-inch drive bays	0/0	1/0	2/1	1/0	3/0	1/0	1/0	2/0	1/0	1/0	+
User-adjustable or user-replaceable system clock	•	. O ⁸	0	•	•	•	•	•	•	•	+
Accepts OverDrive CPU	•	•	•	•	•	•	•	•	•	•	+
ZIF socket	0	0	0	0	0	0	0	0	0	0	
esign and construction							LETT				
Case	compact	compact	compact	minitower	minitower	compact	minitower	desktop	compact	compact	
Parallel/serial/mouse/game ports	1/2/0/1	1/2/1/0	1/2/1/0	1/2/0/1	1/2/0/1	1/2/0/1	1/2/0/1	1/2/0/1	1/2/0/1	1/2/1/0	
ervice and support											
Warranty (months)	12	12	12	12	1210	12	12	12	12	12	I
On-site service price per year	free	\$9.95	free	\$99	\$13013	none	free	none	\$60.3514		
Turnaround policy (days at service center)	4	3	7 or more	3	2	0	2	3	1	none	1
Free unlimited support	•	•	•	•	•	0	•	•	•	•	1
Central support	•	1300	•	•	•	0	•	•	•		t
Toll-free support number	•	•	•	•	0	0	•	0	•	•	
Daily support (hours)	11	11	14	9	8.5	0	9	8.5	9	24	t
Saturday/Sunday support	● ¹⁶	●16	● 16	0	●16	0	0	0	0	•	
Electronic BBS support	•	•	•	0	•	0	•	0	•	•	1
Fax support	•	•	•	•	•	0	•	•	•	•	
Dedicated support staff required	n/a	n/a	0	n/a	n/a	0	n/a	0	0	n/a	
Support staff training required	n/a	n/a	0	n/a	n/a	0	n/a	0	0	n/a	
Dedicated support line for dealers	n/a	n/a	•	n/a	n/a	•	n/a	0		n/a	1
											-

All systems include at least a 60MB hard drive and one floppy drive, VGA and color monitor, keyboard, and DOS 5.0. Selling price is either direct or the lowest price we found in calls made to multiple dealers.

² Includes Windows 3.1 and a mouse.

³ Includes a mouse.

⁴ Includes Windows 3.1, Central Point Anti-Virus, Central

Point Backup, QA Plus, Microsoft Works for

Includes mouse, OEM/FindVirus version of Dr. Solomon's Anti-Virus Software, and Stacker 2.0.

EST BU	piamond / AD	ASK-22-3	A86-33- MHI ValueLine MHI ValueLine Gateway 2000	A865AN Keystation	BEST BU Keydata Keydata	Micro Express	Mazbuc	PBAC-	Packard Bell	polyment 33N	SUC ABOUT 11 35 Pylon II Ottoch	A25 SA Silicon Valley	BEST BU	ABGSX ABGSX ABGSX 125	yiner station
	\$1225 ³	\$1199	\$1495 ⁴	\$12495	\$1245 ³	\$1150	\$1279	\$1025	\$12996	\$1250	\$1099	\$1215	\$1324 ²	\$1249 ²	\$1249
	Cx486DLC-40	1486SX-33	1486SX-25	i486DX-33	1486SX-25	Cx486DLC-40	1486SX-25	1486SX-25	1486SX-25	1486SX-33	1486SX-25	1486SX-33	1486SX-25	i486SX-25	i486SX-20
	4/32	2/128	4/64	4/64	4/32	4/32	4/64	4/32	8/20	4/32	4/32	4/32	2/40	4/64	2/32
	256/256	128/1024	0/256	64/256	256/256	128/256	0/256	64/256	128/1024	128/256	0/0	0/0	0/256	256/1024	64/256
	1	1	2	1	2	2	1	1	2	1	1	1	1	1	1
	Maxtor 7120AT	Maxtor 7080AT	WD Caviar 170	WD Caviar 280	WD Caviar 280	WD Caviar 280	Quantum ProDrive	Quantum ProDrive	Seagate ST3283A	Conner CP30064H	Maxtor 7080AT	Conner CP30084E	WD Caviar 280	WD Caviar 280	Conner CP30084E
	120	80	170	80	80	80	80	80	245	60	80	80.	80	80	80
	S&A Labs	Aten	Gateway 2000	Aten	Silicon Star	Micro Express	Micronics	Free Technology	Packard Bell	Polywell	TMC	Silicon Valley	Tandy	Flex	Xinetron
	OEM WD GUI Graphics Adapter	JAX-8212 VGA Graphics	WDC- 90C31	DFI VG7700	JAX- 8224A V1	WD OEM GUI Graphics Adapter	JAX- 8223d/v2	AVGA2	Oak Technology	Orchid	Boca VGAPlus	Trident TVGA 9000	WDC	STB PowerGraph VL-24	Trident JAX- 8216A/VI
	1MB	1MB	1MB	256K	512K	1MB	256K	512K	1MB	1MB	512K	512K	512K	1MB	512K
	Diamond Superama FM 360	KFC CK1428	Gateway CrystalScan 1024NI	Premier Innovations 41	Korea Data Systems SVGA	Micro Express	ViewSonic 1	CTX CVP5468A	Packard Bell P38538 SVGA	Polywell	Q-Tech/ Tatung CM14SBM	KFC	Tandy VGM-225	CTX CVP-5439A	Socos CM1402
	0/6/0 0 2/3 0/0	0/4/2 0 2/3 0/0	0/5/0 0 1/1 1/0	0/5/1 0 2/3 0/0	0/4/1 0 1/2 1/0	0/5/0 0 2/3 1/1	0/6/0 0 2/3 0/0	0/4/2 2/2 1/3 1/0	0/4/0 0 1/2 1/0	0/4/0 2/0 1/2 1/1	0/3/3 0 2/3 0/0	0/4/2 0 2/2 1/0	0/5/0 0 1/2 1/0	0/6/0 2/0 2/3 2/0	0/4/0 0 2/0 2/0
	•	•	•	•	0	•	0	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	0	0	0	•	0	0	0	0	0	•	0	0	0	0	0
	compact	desktop	compact	compact	compact	minitower	compact	compact	compact	desktop	compact	minitower	compact	compact	compact
	1/2/0/0	1/2/0/1	1/2/1/0	1/2/0/1	1/2/0/1	1/2/0/1	1/2/0/1	1/2/0/1	1/1/1/1	1/2/0/1	1/2/0/1	1/2/0/0	1/2/1/0	1/2/0/1	1/2/0/09
	1511	12	12	12	18	24	12	12	12	1212	12	24	12	12	36
	\$75	none	free	none	free	\$50	\$45	\$100	free	\$75	free	\$99	\$129	free	15
	2	1	none	none	1	2	1	2	4	2	2	7 or more	2	2	2
	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•	•	•	•	0	•	•	0	0	0	•	•
- 1	9	9	18	12	11	24	10	10	24	9	10	9	9	24	9
	0	0	•16	•	•16	•	0	•16	•	•16	0	0	0	•	0
40	0	•	•	0	0	0	0	•	•	0	•	•	•	•	•
	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	•	n/a	0	0	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	0	0	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	0	0	n/a	n/a
	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0	0	n/a	0	0	n/a	n/a

⁹ Network ports (ethernet or ARCnet)

¹⁰ One year parts, four years labor warranty.

11 15 months parts, 24 months labor warranty.

⁶ Includes Windows 3.1, mouse, 1-2-3 for Windows for Packard Bell version 1.0a, Lotus Write for Windows 2.0.

⁷ Also included in free 32/16/8-bit slot count.

⁶ CPU card system with 33-MHz cards available.

15 Price not available at

press time.

16 Saturday only.

12 One year parts, five years labor warranty.

¹³ On-site service costs 10 percent of system price.

¹⁴ On-site service costs 5 percent of system price.

JUNE 1993 • PC WORLD 131

NETWORKING FOR THOSE TRYNGTORUN A BUSINESS. NOTA COMPUTER.



If you're a Windows user, Windows for Workgroups is the easiest way to network. If you're not using Windows, it's one of the best reasons to start.

No matter what business you're in, you stand to do a lot more of it when all your PCs are working together. And Microsoft Windows for Workgroups is the easiest way to connect them.

Everyone benefits from a network. You can share letters and memos. And you can share one printer instead of buying several. Groups can develop reports together. Departments can work on common files. And everybody can have access to the latest (up-to-the-nanosecond) customer database or even an accounting Windows for Workgroups after watching 4 of his employees try to manage the accounting for 3 operations. Now they don't have to enter the same inventory, payable and receivable data into several PCs. Instead, they enter it once into their accounting package and it's a done deal, making everyone's life a lot easier.

Over the next year, Crest figures he'll save around \$30K. Money that might be spent on more important things. Like ice cream.

Getting started is easy. Both in effort and in money spent. You can

do it yourself.

Or we can put

you in touch

with someone

who can help.

Call us at

THE PROFIT PICTURE

Left: Windows for Workgroups makes it easy for groups to share files and information. Right: Which makes it much easier for you to show a profit.

system. Of course, Windows for Workgroups has security features in case you don't want everybody up on all the latest.

We could tell you how well Windows for Workgroups works. But it might be more convincing if you heard it from someone like you, who doesn't have a lot of time to spend running computers.

Crest Oelke at Dairy Queen of Greater St. Louis decided on

(800) 426-9400, Department JM7.

And start networking with Microsoft Windows for Workgroups. You'll be amazed how little time you spend on your PC.

And how much more time you can spend on your business.





Spreadsheet

Today's spreadsheets are smarter than you think.

Unlock their power with these
50 tips, tricks, and shortcuts for Excel,
Quattro Pro, and various versions of 1-2-3.

Tips

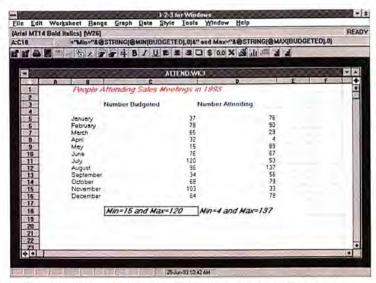
is guarding secrets about what it can really do? And who has time to coax those secrets out? You probably don't, but we do. We prowled on-line services, cornered our writers and editors, and scoured published works for clues to *Excel*, *Quattro Pro* for both DOS and *Windows*, and every flavor of *1-2-3*. From the developers who wrote the software to the people who use it every day, we tapped experts

who have delved below the surface of these programs. So read on.

We've organized these tips by program so you can see at a glance which section applies to you. But remember, what works with one spreadsheet often requires only a few minor changes to work with others. For general advice that will work in any program, check out the Tips for All

Edited by Christina Wood Types section.

And Michael Desmond



PUT TWO VALUES IN A SINGLE CELL with a formula that displays the minimum and maximum values in a range in any spreadsheet program.

Tips for All Types

1

Random Numbers

Need to generate random numbers? To simulate a six-sided die, enter 1 in cell A1 and 6 in cell B1. In a different cell, type the formula @INT(@RAND()*(B1A1+-1))+A1 for 1-2-3 and Quattro Pro or =INT(RAND()*(B1-A1+1))+A1 for Excel. (Excel users who've installed the Add-in Functions add-in macro can use the formula =RANDBETWEEN(A1,B1).

Every time you recalculate, the formula will display a new random integer between 1 and 6. If you need a random number between, say, 100 and 400, just enter 100 in A1 and 400 in B1 and recalculate.

2

A Range by Any Other Name

1-2-3, Quattro Pro, and Excellet you assign names to cells or groups of cells. Once you assign a name to a column, row, or range of cells, you can use the name to specify that range in any formula or reference.

To create a range name in Excel, select the cells you want to identify, select Formula. Define Name, and enter a name

at the prompt. To test it, enter a few numbers inside and outside the named region, and enter =SUM(name) (name is your range name). Your formula totals all the numbers in the range.

For all flavors of 1-2-3 use |Range Name Create, enter a name, select the area to name, and press < Enter twice. In Quattro Pro use Edit Names Create and enter the name. Do the test above using @SUM(name) to total the numbers entered in the named range.

3

Get the Most Out of That Cell

For a lean, tight worksheet, use a formula to display two or more values in one cell. Suppose you have a range named Budgeted and want to know its maximum and minimum values. The formula (using *I-2-3*'s syntax) +"Min="& @STRING(@MIN-(BUDGETED),0)&" and Max ="&@STRING (@MAX(BUDGETED),0) will show both values in a single cell.

If the largest value in Budgeted is 120 and the smallest is 15, the formula will return the string 'Min=15 and Max=120'.

Normally it takes four cells to display this information (two for the values and two for the labels). However, this technique allows you to display all the information in a single cell.

4

Exact Matches for Lookups

The Lookup function found in virtually every spreadsheet program is handy. It lets you search a worksheet for a value. But it's not foolproof. If it can't find an exact match, it settles for the largest number less than the one you're seeking. If, say, you're searching an inventory database for a part number, you

don't want approximate matches. You only want to know if the part is there.

This technique returns 'NA' if an exact match isn't found. A two-column part list named List has part numbers in the first column and descriptions in the second. Type the part number you want into a cell named Part. The formula @IF(@LOOKUP(PART, LIST, 0)=PART,@VLOOKUP(PART, LIST, 1),@NA), which works in all versions of 1-2-3 and Quattro Pro, returns the corresponding description only if the part number is present.

In Excel, =IF(VLOOKUP(PART,LIST,1) =PART,VLOOKUP(PART,LIST,2),NA()) is the equivalent formula.

5

Don't Divide by Zero

If you use spreadsheets to track budgets, you probably calculate percentage changes from year to year. Problem is, the formula +(current-previous)/previous, fumbles when you track a category without a value in the previous year. It's trying to divide by zero—a spreadsheet no-no. Use the IF function to test for a zero value and display a message if zero is found.

In 1-2-3 and Quattro Pro, use @IF(previous=0,@NA,(current-previous)/previous). In Excel, use =IF(previous=0, NA(),(current-previous)/ previous).

If you don't like the @NA or NA() function's display, you can replace it with a string such as "No previous value".

6

Stock Market Format

NYSE stock market quotes are printed with a plus or minus sign, two spaces or digits, and a fraction if needed. Excel can display decimal values as fractions and can customize formats to match stock quotes: Select the range to format, select Farmat Number, and select Fraction from the Category list box. Replace the entry in the Code box with +?? ?/?;[Red]-?? ?/? and select OK.

1-2-3 and Quattro Pro don't have a fraction format or let you customize your own. But you can use a pair of formulas to convert a value into a string in NYSE stock market formatand for text screens and monospaced printouts, to pad it with spaces to right-justify the quote. Assume the decimal value is in cell A1. In B1, enter @IF(A1< 0,"-","+")&@IF(@ABS(A1) <10," ","") &@IF (@ABS(A1),1," ",@STRING(@ABS(@INT (A1)),0))&" "&@CH00SE(@ABS (A1-@INT(A1))*8," ","1/8","1/4", "3/8","1/2","5/8","3/4","7/8") (there's one space between the third, fifth, and sixth pair of quotes, and three spaces between the seventh pair). In cell C1 of Quattro Pro, Quattro Pro for Windows, or 1-2-3 for Windows, enter @IF(A1*8=@INT(A1* 8),B1, "ENTRY ERROR") and set right alignment for column C. For 1-2-3 only, put @IF(A1*8=@INT(A1* 8),@REPEAT(" ",@CELL("width",C1)-@LENGTH(B1))&B1,"ENTRY ERROR") in C1. This last formula uses @CELL() to determine the width of the cell, so you'll have to recalculate (<F9>) if you change the width of column C. Also remember that you can't

perform calculations on these strings, so you'll need to use the original values in any formulas.

7

Round 'Em Up!

If you're calculating items that can't be divided, you might want your spreadsheet to round numbers up. For instance, to determine how many four-person cars you need to rent for 13 employees attending a trade show, you'd create a formula that divides 13 by 4-+13/4 in 1-2-3 or Quattro Pro and =13/4 in Excel-and use the ROUND function to round it to an integer. In this case, the value is 3.25, which the ROUND function then returns as 3. Problem is, someone will end up riding in the trunk. Trick the spreadsheet into always rounding up by adding .49 to the quotient, causing it to bump up to the next integer if things don't divide out right. (If the divisor is greater than 100 but less than or equal to 1000, add .499 instead of .49 to the quotient; if the divisor is greater than 1000 but less than or equal to 10,000, add .4999; and so on.) Your formula is @ROUND(13/4+.49.0) for 1-2-3 and Quattro Pro and =ROUND(13/4+,49,0) for Excel. You can also replace the number 13 in these formulas with a cell address or name—and enter the number of attendees in that cell—to make repeated calculations simpler.

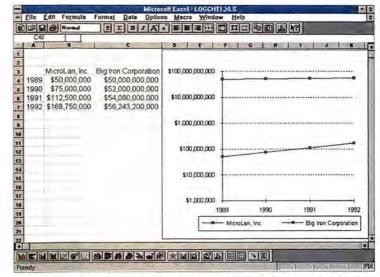
8

Copy Formula Parts

Here's a Windows-only tip: Everyone knows when you use the Clipboard to copy cells and ranges of cells, Windows adjusts the copied formula's relative references to reflect the move. But if

you paste the copy while editing a cell, you can bypass the reference adjustment and get an exact copy. You needn't copy an entire cell: Just copy a piece of a cell's formula by selecting that portion on the editing bar.

In Excel and Quattro Pro for Windows, both Edit • Copy and Edit • Paste work when you're editing a cell. You can also use < Ctrl>< Insert> and < Shift> < Insert>, respectively, to cut and paste. In 1-2-3 for Windows, you must use the keyboard commands because you can't access the menus while editing a cell.



A LOGARITHMIC CHART shows the relative change of each of these two companies much better than a standard bar chart does.

9

Logarithmically Scaled Charts

A bar chart comparing a \$50 billion company growing at 4 percent with a \$50 million company growing at 50 percent fails to show the small company's million dollar changes. A logarithmically scaled chart clearly shows the relative differences between the companies. In Excel, select a type of chart from the Gallery menu; in the dialog box, you can identify a logarithmically scaled chart by the grid lines squeezed together toward one end of the chart

one end of the chart selection icon. If the type you want doesn't offer log scaling, select it anyway, then select the chart's Y-axis. From the menus select Format • Scale • Logarithmic Scale. In 1-2-3/W, use Chart • Axis • Y or 2nd Y • Logarithmic. In Quattro Pro for Windows, select Property • Y Axis • Log.

Sort Query Distribution Matrix Repression Parse Table Calculate linear regression Regression Output: Advert Sales 791105.0 Constant 125,000 509,001 75221.17 0.526491 Std Err of Y Est 132,000 1,487,272 Feb .000 Mar 466.652 R Squared No. of Observations Apr 98,000 310,925 95,000 Degrees of Freedom 10 May Jun 93,000 254,897 Jul 110,000 X Coefficient(s) 5.128240 Aug 120,000 338.982 Std Err of Coef. 1.537931 125,000 Sep 409.012 115,000 1,228,720 0 725597 0ct Nov 122 888 549,823 1,438,772 Dec 120,000 05:47 PM

FIND THE CORRELATION BETWEEN TWO SETS OF DATA with a formula that plots the correlation coefficient in any spreadsheet program.

10

What's the Correlation?

The best way to detect a correlation between two sets of data—say monthly advertising expenditures and monthly sales—is to calculate the correlation coefficent. A positive coefficient means more advertising is associated with more sales. A negative coefficient means months with more advertising generally have lower sales (bad news). A coefficient near zero means sales and advertising expenses don't correspond in any systematic way. ('The coefficient ranges from –1 to +1.)

Assume you have two ranges called Advert and Sales (note: they must have the same number of values). In 1-2-3, select /Data · Regression · X-Range, type Advert (or press <F3> and select the range), and press <Enter>. Select Y-Range, type (or use <F3> to select) Sales, and press <Enter>. Now select Output Range and specify the upperleft cell of any blank four-column-by-nine-row area. Select Go to calculate. To find the correlation coefficient, calculate R Squared's square root and make it negative if X Coefficient(s) is negative: In the cell where you want the result to appear, enter @IF(and point to the cell that contains the value of the X Coefficient(s). Type <0,-@SQRT(and point to the cell containing the value of R Squared. Type), @SQRT(and point to R Squared's value again. Press)) < Enter>. Note that if the data changes, you must rerun the regression (|Data • Regression • Go) to update regression data and the correlation coefficient.

This example uses 1-2-3, but you can get these results from Quattro Pro and Quattro Pro for Windows using the Tools • Advanced Math • Regression command: Use < F3> to set Independent to Advert and Dependent to Sales and indicate any empty cell for Output. Then set up the square root formula. In Excel, there's no need to deal with regression or X coefficients: Simply enter = CORREL(ADVERT, SALES) in any blank cell.

11

Correlation Revisited

If your spreadsheet has a builtin function called SUMPROD-UCT there's another way to calculate a correlation coefficient: Assume the two ranges are called X and Y (they must have the same number of values). The formula (@COUNT(X) *@SUM-PRODUCT(X,Y)@SUM(X)*@SUM(Y))/ (@SQRT(@COUNT (X)*@SUMPRODUCT(X, X)-@SUM(X)^2)*@SQRT(@COUNT (X)* @SUMPRODUCT(Y,Y)-@SUM(Y)^2)) will return the correlation coefficient for the two sets of data. (In Excel, you need to start the formula with = and omit all of the @ signs.)

1-2-3 for DOS

12

Get There With End

To see all 8192 rows and 256 columns of a worksheet, your screen would have to be 7 yards wide and 61 yards long. That's why the <End> key is so useful. Press <End> followed by <Home> and the cell pointer jumps to the bottom right corner of the active portion of a

spreadsheet. Put the cell pointer on a blank cell and press <End><Right> and the pointer jumps to the first non-blank cell. If no non-blank cells are in that direction, the pointer jumps to column IV. Put the

pointer on a non-blank cell and press <End> <Right> to jump to the cell before the next blank cell (the *last* non-blank cell in that range of non-blank cells).

13

End Tedious Formulas

Jumping around with the <End> key (see tip 12) is also useful for creating formulas. Say you want to total a column of numbers. Type @SUM(in the cell where you want the total to appear. Move the cell pointer to the top of

the column of numbers (on the first number you want to include). Press <Period> to anchor the range. Then press <End><Down>. The pointer jumps to the last number in the column, highlighting the cells, and adding their range address to your formula. Type the close parentheses and you're done.

14

Navigating Directories

When you select /File • Retrieve in 1-2-3, you get a list of worksheets, if any, in the current directory. You can press <Backspace> to work back up the directory tree if there's a worksheet or subdirectory in that directory. (However, <Backspace> will lose that function if at some point you select a directory that doesn't have a worksheet or subdirectory.)

15

Doing Negative Numbers

It's easy to display negative

numbers in parenthesis in release 2.2 and later spreadsheets. First format the cells where the numbers will be displayed with |Range Format •, or |Range Format • Currency. Then change the global default selected files to launch Wysiwyg when opened. Open a file, press <ahl-<fi>Alt-<f10>, and select /Settings • File • Set. Highlight WYS-IWYG.PLC and press <Enter>. Now choose No and Quit to return to Ready mode. Al-



TURN ORDINARY SYMBOLS ON THEIR EAR with a quick trick that can add emphasis to your spreadsheets.

for numbers with /Worksheet •
Global • Default • Other • International • Negative • Parenthesis •
Quit • Quit. If you want negative
numbers always displayed in
parentheses, rather than just in
the current session, choose
Update between the two Quits.

16

What's That Range Name?

You can use 1-2-3's GOTO (<F5>) command to get to a named range even if you can't quite remember its name. After you press <F5>, press <F3>, 1-2-3 will list all the range names in the current document, and you can simply select the one you want. In fact, <F3> will list range names any time you are prompted for a range.

17

Fetch Wysiwyg at the Outset

1-2-3's Wysiwyg add-in can be useful, but it's also a memory hog. Only sacrifice memory for the files that need it by setting though Wysiwyg will not be active this session, it will load whenever you open this file in the future.

18

Flipping Symbols

Symbol characters, such as arrows, help draw attention to parts of a worksheet. But if you can't find an arrow (or symbol) that points in the right direction—straight up, say—here's a handy trick.

In 1-2-3 3.4, launch Wysiwyg (<Alt><F10>). Enter a centered character in a blank cell. For this example, use ^d because that's an arrow in 1-2-3's Symbol font. With the cell pointer on the cell with the d, click on the font changer SmartIcon in the first palette (it has a big A and a little a). Keep clicking that icon to scroll through the font names (they appear at the top left corner of the screen). When you see {XSYM12}, press <Enter>. Press <F2> to edit the

cell and put your cursor after the caret (^) and under the d. Then press <Ctrl>-AR<End>-Ctrl>-E <Enter>. That left-pointing arrow will now be pointing up!

19

Send Yourself a Message

You can use the @IF function to alert yourself to a certain condition in a spreadsheet-such as a balance sheet that's out of balance. In prominent, unused cells, place the functions @IF(Bottomline <> 0,"","Out of Balance") and @IF(Bottomline <> 0,"","Check Bottom Line"). Then name the cell that calculates the bottom line Bottomline. Every time you recalculate the worksheet, it tests for the condition. If the condition doesn't exist, the cell remains blank. If it does, the error messages 'Out of Balance' and 'Check Bottom Line' appear.

20

Avoiding the Autoexec Macro

Sometimes you want to open a spreadsheet to view its data without running its Autoexec macro. You can, of course, press <Ctrl>-<Break> if you're fast on the draw. For those with slower reflexes, there's an easier way: In a new, empty worksheet, select |File • Combine • Copy • Entire-File and the file you want to load. This brings up the file, but omits range names and bypasses the Autoexec macro.

21

Start Macros With Smartlcons

Link your macros to 1-2-3 3.4 Smartlcons and you can run them with a mouse click. You can even customize icons with your own labels and images.

In the seventh palette, click on the icon that looks like a bold U and a pencil tip. The Assign Macro to User Icon dialog box appears. If necessary, select Next Icon until you find an unused icon, Click in the Icon Description field and type

a line describing what your macro does. You can type the macro into the Macro Text field or indicate where it's located on your worksheet by selecting Get Macro from Sheet, highlighting the macro, and pressing <Enter>.

Click the icon with the left mouse button to run your macro. Your descriptive label shows when you put the mouse pointer on the icon and hold down the right mouse button.

22

Tricky Loan Calculation

Want to know how many payments you need to pay off a loan? Trick the @TERM function in release 2.01 and later into doing it for you. Usually, you use the function—the syntax is @TERM (payment, rate.futurevalue)—to calculate how many years of, for example, \$2000-a-year payments it

will take for your retirement savings to grow to \$100,000 (if your savings earn 9 percent a year). The actual formula for this example is @TERM(2000,.09,100000). But enter a negative future value, and @TERM calculates the number of payments needed to pay off a loan. For example, to calculate how many \$250-amonth payments will pay off a \$5000 car loan (if you pay 1 percent interest a month), use the formula @TERM(250, .01, -5000).

<Ctrl> key put some spring in your pace. Press <Ctrl><Page Up> while in a sheet, and you instantly jump down one level.
<Ctrl><Page Down> leaps up a sheet. If you want to get back to sheet A, press <Ctrl><Home>.

24

Custom SmartFill

1-2-3 for Windows 1.1's Smart-Fill command fills in numbers, months, and days of the week, similar to features in other spreadsheets. But it has a major advantage: You can customize the series to suit your needs. Open the SMARTFLL.INI file found in the 1-2-3 for Windows directory in any text editor. (If it's not there, you must install the SmartPak disk that's included with release 1.1.) You'll find two series in the file that show how to lay out your own series. If you were, say,

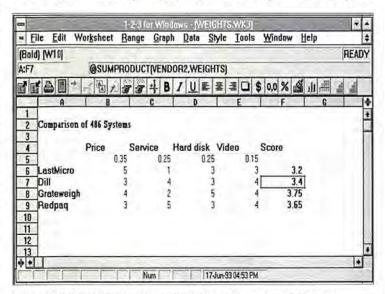
Order the names hierarchically, alphabetically, or any way you want. Their item numbers determine their fill sequence. Save and close SMARTFLL. INI. Go back to 1-2-3/W, type Bart in a cell, select that cell and ten adjacent cells. Then choose Tools • SmartPak • SmartFill. The other names will appear in item-number order, starting over when the end of the sequence is reached.

25

Supercharged Decision Making

Making decisions is confusing when considering the relative importance of many factors. Here's a macro that turns decision making into a science.

Say you want to purchase computers for your office. You've narrowed the choice to four models: LastMicro, Dill, Grateweigh, and Redpaq. You



TURN DECISION MAKING INTO A SCIENCE by weighting your choices on a spreadsheet using 1-2-3 for Windows' SUMPRODUCT function.

1-2-3 for Windows

23

White Mice Can't Jump

If you use the mouse to move between sheets in a 3-D worksheet, you could be wasting time fumbling around. Let the entering the names of people in your workgroup, create a new series. It might look like:

[SET 3]
ITEM1=Arnold
ITEM2=Bart
ITEM6=Garth
ITEM5=Joel
ITEM4=Lisa
ITEM3=Maggie

have four criteria (of various relative importance) you want to apply to your decision: price (35 percent), service (25 percent), hard disk size (25 percent), and video speed (15 percent).

Enter your four categories in columns B through E on one row. Then enter the vendor names two rows lower in column

SPREADSHEETS TIPS

A. Name the vendor rows VEN-DOR1, VENDOR2, VENDOR3, and VEN-DOR4. Enter the percentage value (.35, .20, etc.) in the row under the categories to assign weights to them. Name this row WEIGHTS. Using data from a PC World review, enter a value between 1 and 5 (five is the best score) for each model in each category. Type the formula @SUM-PRODUCT(VENDOR1, WEIGHTS) in the first empty cell in the VEN-DOR1 row, Repeat, using the appropriate name (VENDOR2, etc.) in the three cells below. The @SUMPRODUCT formula multiplies each score by its weight and adds them together to return a rating for each model.

26

Speeding Up Linked Formulas

It's easy to build linked formulas in 1-2-3 for Windows. With two or more worksheets on the desktop, just point and click to build formulas between worksheets. You can even link both WK1 and WK3 files with the same command. (WK1 files

Bonus Tips for 1-2-3 for Windows Release 4

Editing the Way It Oughta Be

Tired of moving the pointer up to the status line to edit your formulas? The brand-new release of 1-2-3 for Windows makes that extra mouse move obsolete. To edit the contents of a cell right in the worksheet, simply double-click on the cell.

Fully Functional

Don't bother memorizing the exact name or syntax of the @function you want; simply click the @Function tool above the SmartIcons tool bar and select from the drop-down list box. Your function lands in the selected cell with a cheat line for the syntax in place.

The default @function drop-down box comes with a selection of commonly used commands, but you can customize that menu to include the @functions you use most often. To add, say, @DAYS—which calculates the number of days between two dates—click the @Function tool, then click Menu. You'll get a new dialog box. Select @DAYS from the list of @functions and pick a position for your new menu item in the Current Menu list box. Click OK.

Here are some tricks for avoiding lulls: Load the source file before the destination file, use WK3 instead of WK1 files, and build your models with multiple worksheets instead of multiple files.

27

Do-It-Yourself Timeline in 1-2-3/W

Timelines help manage complex projects. But who wants to buy a project management proStart, Actual Start, and Actual End entered in B3..D3 as shown in the figure below. Select B4..D7, then select Range • Format and type 1 to select the first date format. Our project starts on July 1, so enter 7/1/93 in all four cells beneath Projected Start. In the next two columns, enter the actual start and completion dates of each activity as shown.

Select A4..A7, select Edit•
Quick Copy, type F4, and press

<Enter>. Select G4..H7, select Range · Format, and select General from the Format list box. In cell G4, enter the formula +C4-B4 and copy it to the three rows below. (This formula calculates how many days into the project an activity begins.) In H4, enter +D4-C4 and copy it to H4..H7. (This calculates the days from the beginning of the activity to its end.)

Now you can create your timeline. Select F4..H7, choose *Graph* • *New*, and click *OK* to bring up a graph.

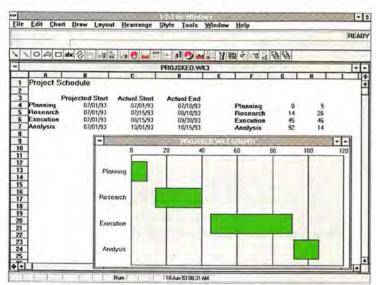
Select Chart • Type, click the Bar radio button, choose Horizontal in the Orientation section, click the bottom chart icon in the center of the dialog box, and click OK. You now see a red and green colored horizontal "stacked" bar chart. Select Chart • Options • Colors and in the Data range colors section, click the A box. Choose H from the bottom of the color choices. Finally, click OK and your timeline is complete.

Excel

Keyboard Navigation

Drag-and-elick operation has eased spreadsheet work, but all that mousing around takes time. Instead, hold down < Ctrl> when hitting a cursor key to jump the cell pointer from a non-empty cell to the cell just before the first empty cell in the cursor's direction or from an empty cell to the first nonempty cell in that direction. If your pointer is in a long column of entries, press <Ctrl>-<Down> to move it to the last entry. If the pointer is in an empty cell, hit <Ctrl>-<Left> to slide the pointer to the first filled cell.

Use the <Shift> key with <Ctrl>-cursor to select large swaths of a spreadsheet or a long list of entries. For example, to copy a row of headings, place the cell pointer in the leftmost cell of the row, then hold down



PLOT A TIMELINE using a 1-2-3 for Windows spreadsheet for efficient management of complex projects.

work with 1-2-3 for Windows as well as 1-2-3 2.x.) Unrestrained use of linked worksheets, however, can cause serious delays when loading files.

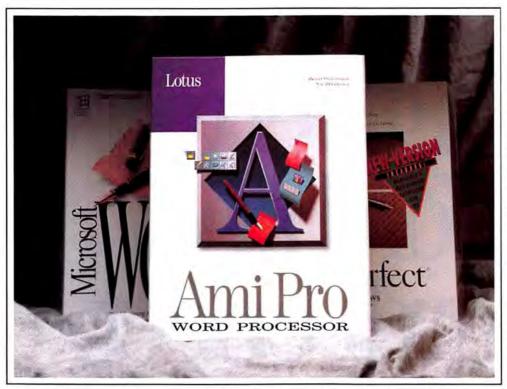
gram when 1-2-3 for Windows can do the job?

Create a table with Planning, Research, Execution, and Analysis entered in A4..A7, and Projected

There's quite a battle raging between Word and Word Perfect.



For seco



In the War of the Words, there's one clear winner. Ami Pro.

Word vs. WordPerfect. It's billed as the battle of the world's two greatest word processors. Hardly.

According to most independent judges, Lotus Ami Pro 3.0 is the

clear and convincing leader of the word processing pack. Word and WordPerfect are following its lead, scrapping it out for second and third.

Check the rankings.

Ami Pro 3.0 is ranked the #1 Advanced Word Processor for Windows[™] by the National Software Testing Laboratories. (9/92)[†]

Recently, in an InfoWorld review, Ami Pro received the highest score ever given for a Windows word processor. (9/28/92)

Lotus Ami Pro captured the 1992 PC Computing MVP Award. (12/92) (Note: The MVP award also

appears in the new WordPerfect ad. That's last year's award.)

PC Magazine recently named Ami Pro one of the Best Products of 1992. They said, "No other product can match...the sheer pleasure of using it." Microsoft Word received an Honorable Mention, with the comment "...it's a step behind Ami Pro." (1/93)

Now, perhaps the battle royale between Word and WordPerfect has been put into perspective.

And you probably wonder what it is that makes Ami Pro clearly better?

The battle of the features.

Simply put, Ami Pro is a faster, easier, friendlier word processor to use. It does

so many things with so little effort, most people never even bother to

open the manual.

To name a few, there's real, honest, no ifs-ands-or-buts WYSIWYG. There's Fast Format, for quick repetition of text formats. There are customizable, editable SmartIcons.™ Not to mention SmartClick, where the right mouse button will automatically shift you to the appropriate dialogue box to

change fonts, styles or frame formats, based on what you're doing.

There's automatic renumbering of lists. Preview of Style Sheets. QuickStart on-line tutorial. Free 24 hour a day technical support." And to ease your mind, a 60-day money back guarantee of your complete satisfaction.

And, if you're switching from WordPerfect for DOS, relax. Ami Pro makes it easy with a number of special features. Like seamless conversion of WordPerfect files. And a SwitchKit so that when you type in WordPerfect commands,

Ami Pro shows you how to perform the same functions using pull-down menus or one-click SmartIcons.

You call the winner.

So what drives hardened reviewers to use words like "love" and "pleasure" when describing Ami Pro? You can't tell from a list of features.

> You've got to experience it. In your office. On

vour PC.

Call us for a free working model of Ami Pro and you'll see for yourself. If you're like most people, once

you actually sit down with Ami Pro, you'll definitely choose it. Over Word. Over WordPerfect,

Over every other word processor out there.

Call Lotus today. at 1-800-872-3387. ext. 8760, for your free working model or to upgrade from your current word processor for just \$129.***





SPREADSHEETS TIPS

<Ctrl> and <Shift>, and press
<Right>. The pointer ends up at
the last filled cell prior to an
empty cell, with all the intervening cells selected. If you
have some empty cells along
the row, continue to hold down
<Ctrl>-<Shift> while you tap
<Right> a couple more times.

29

Automatic Decimal Points

Save time and keystrokes during data entry by letting Excel do some work for you. When entering financial data, or anything requiring two digits after a decimal point, select Options • Workspace and check the Fixed Decimal checkbox (make sure the Places text box reads 2). Values are now entered with a decimal point. Now an entry of 54321 appears as 543.21. Note that the word FIX appears in the status line. To return to normal when you're finished, select Options · Workspace and deselect the Fixed Decimal checkbox.

30

Chart Templates

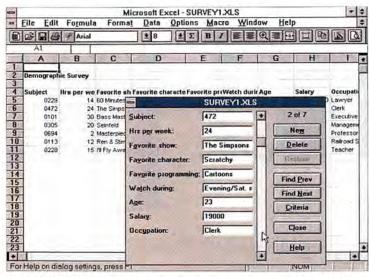
Let templates set up commonly used charts for you. Create the chart as you like, select File•
Save As and in the Save File as

Type list box, select Template. Excel adds the XLT extension, but you need to supply an identifying namefor example, SALES-CHT.XLT. Then in the Drives and Directories list boxes, locate XLSTART, click OK. and restart Excel. Next time you want to create a similar chart, select your data and choose File New; your template name will appear in the New list box. Double-click it and a ready-made chart will appear.

31

Cosmetic Surgery in Excel

Excel normally uses 10-point Sans Serif for cell entries and row and column headings. But you can change that. For a group presentation, for instance, you might want a larger point size or a different typeface. To change the default font to 20-point Arial, open the EXCEL4.INI file (found in your Windows directory) in any text editor and under the [Microsoft Excel] section of the file, enter the line FONT=Arial, 20. If you want



EXCEL'S DATA FORM COMMAND makes data entry a snap—even if you're not creating a database.

to use a different font, toggle to Excel, select Format • Font, and look in the resulting list box for a list of your installed fonts. The new default font takes effect when you restart Excel (old files, however, retain the original default font).

32

An Easy Way to Change Names

If you've named a range and ereated formulas that use that name, you must live with that name forever, unless you want to edit every formula. Right?

Wrong. Use the Changer add-

in file to fix all name references when you change a range name. Select File Open and locate the CHANG-ERXLA file located in EXCEL/LIyour BRARY directory. Click OK to attach the add-in. You'll see a new command-Change Name—in the Formula menu. This command opens a dialog box that lets you select an existing range name and provide a new one. If you change names often, make the command permanent

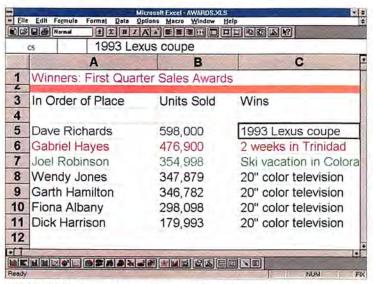
by choosing Options • Addins • Add and specify the CHANGER.XLA file.

33

Fast Data Entry

Facing a heavy-duty data entry chore in Excel? The Data•
Form command can make life easier—even if your worksheet isn't going to be used as a database. This is especially handy for data entered in rows, such as survey responses and monthly expenditures.

First, set up your column labels, which act as field names for each record: fill the first column with data that identifies each record; and select the entire range, including the titles. Choose Data . Set Database to define the input area as a database. Select Data • Form. This command displays a data entry dialog box that makes it easy to enter data. The first field contains the record identifier. Press <Tab> to move to the next field, the title of which is the second column's label. Enter the data and press <Tab> to progress to the next field. When you've completed a record, press <Enter> to move to the next. You can correct mistakes afterward by pressing



CHANGE THE DEFAULT FONT IN EXCEL in order to change the look of your usual worksheet completely.

<Shift>-<Tab> to move to the previous field or <Shift>-<Enter> to move to the previous record.

How Many, Not How Much

If you want to know how many times a value or string occurs in an Excel spreadsheet without performing calculations, use an array formula. Arrays can replace several single-value formulas and, in effect, let you do several things at once. Say you want to know how often Anne has checked a book out of the office library. If each checkout is recorded on a separate row, with name, book title, checkout date.

and return date in columns from left to right, type =SUM(IF(A3:A100 ="Anne",1)) in an out-of-the-way cell and then press < Ctrl>-< Shift>-< Enter> (if you accidentally press only <Enter>, press <F2> and then <Ctrl>-<Shift>-<Enter>). Excel puts braces (()) around the entry to indicate an array formula. If Anne's name shows up 12 times in the column, '12' will appear in the array formula's cell.

35

Pulling Rank

Here's a simple formula that ranks data in a range. Say you want to rank semiconductor manufacturers by the volume of stock traded on a given day. For our example, we'll use a range named SHARES (D6:D15) in our figures. In B6, type =SUM(IF(D6>= SHARES,1)) and press <Ctrl>-<Shift>-<Enter>. Excel recognizes the entry as an array formula and places curly braces around it. Copy the formula to D7:D15, and the ranks will be calculated. Change a number in column D and watch the ranking change.

36

Avoid Long Names

File Edit Formula Format

圓♂**日**● Normal

3 NASDAQ Most Actives

Rank

5

6

7

9

10

11

12

13

1

At first glance, the 31-character limit for file names in a workread. Don't forget to annotate your chart with something like "dollars in thousands."

To create a custom numeric Microsoft Excel - ACTIVES XLS Data Options Macro Window Help 王 B I A X 摩養書配 口口口 吃面 & 校 (=SUM(F(D8<=SHARES,1))) Company Shares Traded 4,176,900 1 Amgen 5 Dell Comp 1,486,000 2 Intel Corp 3,043,000 4 Novell Inc. 1.918.800 3 Seagate Tech 2,139,000

RANK INFORMATION AUTOMATICALLY with an array formula. Change the number of shares traded, and the rank changes.

book is a welcome release from the 8-character cage imposed by DOS. But use all 31 characters, and you may soon regret it. Every formula that references a cell in a workbook's file includes the workbook's name and the file's name. Not only do long references make your formulas difficult to understand and edit, they can easily break the 255-character limit for a cell.

Stick with shorter names, and you'll save your neck.

37

Free Your Chart of Zeros

Look at any annual report, and you'll find charts marked in millions or billions of dollars. Keep Excel charts free of unnecessary zeros with a custom number format that hides the last 3, 6, 9, or more digits. Use the format in your worksheets, and the charts you create from them will be much easier to

format, select the cells to be formatted and choose Format. Number: Press <Tab> to highlight the current entry in the Code text box and type the code that describes the format you want, replacing what appears in the box. For example, #,##0, removes three digits, so 100,000,000 appears as 100,000 and #,##0,, removes six digits. so 100,000,000 appears as 100

(each trailing comma in the code indicates three digits are to be dropped).

Custom numeric formats are stored with a worksheet. To reuse one, select Format Number, click All, and your custom format appears in the Format Codes section. Double-click the custom format you want.

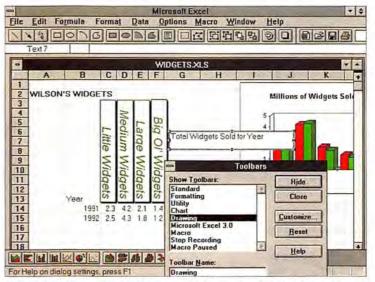
38

FIX

Turn a Phrase

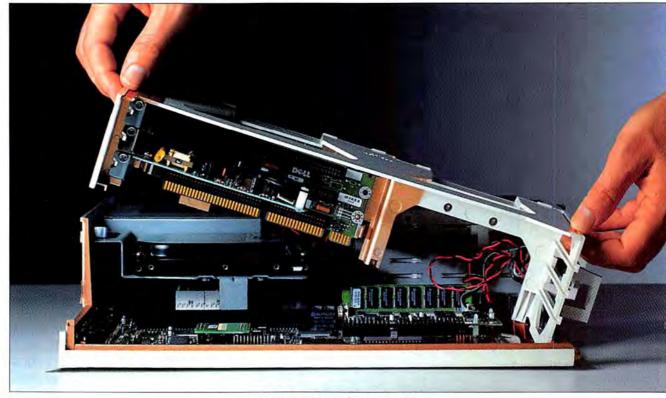
Excel lets you change the orientation of text or values in a cell with Format Alignment. But vertical text automatically changes the row height to fit within the cell, leaving you with abnormally high rows. An alternative is to use Excel's text tool to add a free-floating text box.

Open the Drawing tool bar by selecting Options . Toolbars and double clicking Drawing in the Show Toolbars list. Click the text tool icon (it looks like a page of text) and drag the mouse pointer in the worksheet to draw a box. Type your text into the box and right-click the box to evoke the shortcut menu. Select Text and click the desired orientation. Set the horizontal and vertical alignment and use the Patterns button to set border and fill options. Close



ROTATE TEXT OR VALUES IN A CELL with the Text tool on Excel's Drawing tool bar without altering row heights.

PRETTY EASY.



DELL 486/L SERIES



The Dell® 486/L has embedded diagnostics that can identify a problem component just by pushing the reset button twice. Even if a major component like the monitor or hard drive isn't working, a video display or beepcode will tell you the exact problem.



The Dell 486/L comes apart easily by first taking out two thumbscrews and removing the chassis cover. That's right, you don't need a hammer. Crowbar. Or a chainsaw.



Just push two buttons (you won't need an M.I.T. degree for this either), tanplug two cables, and slide out your diskette drives for easy upgradeability or easy upgradeability or service. Or to add a tape drive or CD-ROM drive.



Then all you do is remove one tiny, little screw and pull out the entire card cage to add different user upgrade options like video memory. You can also add cache. Add Pentium™ technology. Change the processor. Or even swap out the system board. A child could do it. Or even your boss.



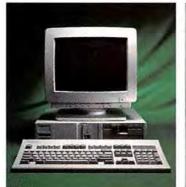
Or if you want to get to your hard drive for easy maintenance or for an upgrade, just take out another screw, unplug two cables, and snap it out.

If you need to remove a hard drive on a Compaq ProLinea System, it's not a pretty picture. And getting to the system board can be downright frightful.

Not so with the Dell 486/L series. In fact, it's the world's easiest PC to take apart. To remove the hard disk of any one of the L Series systems, take out one screw with a standard screwdriver. Access the Dell system board just by

removing our unique expansion card cage, with network cables intact.

To remove our competitor's hard drive, take a crack at five screws with a



THE DELL 433/L i486™ DX 33MHz SYSTEM \$**1,899**

BUSINESS LEASE®: \$70/MO.

4MB RAM • 170MB (17ms)
HARD DRIVE • 3 ISA EXPANSION
SLOTS • UPGRADEABLE TO PENTIUM
TECHNOLOGY • ACCELERATED LOCAL
BUS VIDEO WITH 1 MB VIDEO RAM •
SVGA 1024I MONITOR
(14", 1024 × 76B, .28mm)
• ONE DISKETTE DRIVE (3.5" OR 5.25")

MS-DOS® 6.0

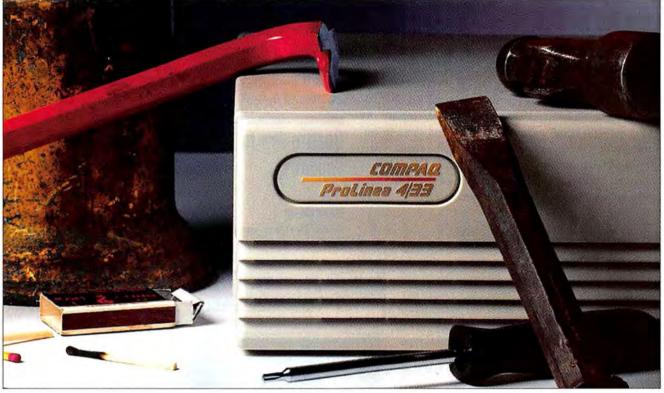
Many other I Series system

Many other L Series system configurations available.

*Guarantees available in UNA only for registered owners of Dell Performance Series systems prachased after 7/1/92. For a complete copy, please call our TechFaces line at 1-800-950.

Group, Inc. *On-site service provided by BancTec Service Corporation. On-site service may not be available in certain remote locations. The Intel Inside logo is a registered trademark and i486 and

PRETTY UGLY.



COMPAQ PROLINEA

T15 Torx screwdriver. (No, your local grocer probably won't have one.) And to access the system board, should you decide to accept this mission, you may have to disconnect all of the cables, then remove the expansion cards, then replace the expansion cards, then reconnect all the cables.

Dell also has embedded diagnostics that can run even when the system won't boot. You'll never waste your time searching high and low for the diagnostic diskette that came in the box.

Another beautiful thing about Dell is the service

guarantee' ensuring you on-site service by the next business day? Which may be why we're the leader in customer satisfaction.

Why not order one right now? That's pretty easy, too.



WHEN CALLING, PLEASE REFERENCE #11DBB.

HOURS: 7AM-9PM CT MON-FRI, BAM-4PM CT SAT, 10AM-3PM CT SUN.
IN CANADA; CALL 800-668-3021. IN MEXICO CITY: 228-7811.

1329 or write Dell USA L.P., 9505 Arboretum Blvd., Austin TX 78759-7299. Attention Guarantees. *Prices valid in U.S. only. Some products and promotions not available in Canada or Mexico. *Leasing arranged by Leasing Pentium are trademarks of Intel Corporation. MS-EOS is a registered trademark of Microsoft Corporation. Dell disclaims proprietary interest in the marks and names of others. ©1993 Dell Computer Corporation. All rights reserved.

the dialog box and adjust the text position by dragging a side (not a handle) of the text box.

Quattro Pro for DOS 39

Add @Functions to Your Formula Bar

Avoid troublesome syntax errors and wasted keystrokes by pulling function statements from a list. Alt><F3> brings up a scrollable list of @functions to select. Just highlight the function you want, press Enter>, and it appears in the formula bar, ready to complete.

40

Stop Chasing Your Tail

Like an overexcited pup, Quattro Pro will chase its own computational tail if you create formulas that refer to each others' cells. For example, set cell B2 to equal the sum of cells B1 and B2, and you have a circular reference. While Quattro Pro helps you avoid meaningless calculations with a 'CIRC' warning at the bottom of the screen, what you really need is a way to know where the offending reference is. There is a way. In a blank cell, enter the formula @CURVALUE("Audit" "Showcirc"). and it will display the address of the circular reference.

41

Breaking Up Names

Why does it seem like data is never quite in the format you need? Say you have in column A a list of names (probably imported from a text file) that are in first name, last name format. Wouldn't it be more useful to have the first and last names in separate columns? Just plug in the formulas @LEFT(A1,@IF(@ISERR(@FIND(" ",A1,@FIND(" ",A1, 0)+1)),@FIND(" ",A1, 0,FIND(" ",A1, 0,FIND(" ",A1,0)+1))) into B1 and @RIGHT(A1,@LENGTH(A1)-@IF(@ISERR(@FIND(" ",A1,0)+1))).

1)),@FIND(" ",A1,0),@FIND(" ",A1, @FIND(" ",A1,0)+1))-1) into C1, then copy them down the length of your list. The first formula returns the first name, plus a middle name or initial (if present). The second formula returns the last name.

Want to sort by last name? In cell D1, enter +C1&", "&B1, copy it down the list, select Database • Sort • Block, specify A1 through the last name in column D and press <Enter>, select Ist Key, specify D1 and press <Enter>, press A and <Enter>, and finally, select Go.

42

Down, Cursor!

For entering data in columns, a macro can make the <Enter> key move the pointer down after it enters your input. In cell A1, type (?)(DOWN)(BRANCH A1) and press <Enter>. The {?} waits for user input with the <Enter> key. [DOWN] moves the cell pointer down one cell. [BRANCH A1] makes the macro execution jump to cell A1, so the macro repeats itself (if you entered the macro in another cell, enter that cell name instead of A1).

Start the macro by selecting Tools • Macro • Execute while in the macro cell, and then press < Enter>. Now < Enter> moves the pointer down one cell after entering data. When you're finished, press < Ctrl> < Break> to end the macro. < Enter> will now function normally.

43

Chartless Charting

If you use a text-only printer, you can still turn spreadsheet numbers into a graph. Enter your items in the left column and your figures in the right (this works only with a one-series table). Select the value series and choose Style•Numeric Format, and select the +/- format. The numbers appear as + or – symbols; 4 becomes four plus signs, -3 becomes three minus signs. If you get a line of asterisks, you need to widen the column to fit the graph.

Quattro Pro for Windows

44

Hidden File List

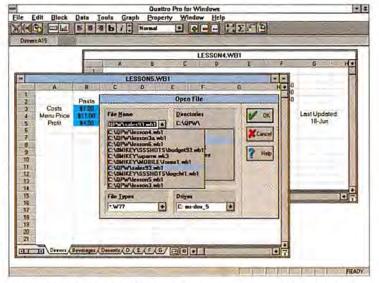
The File Open command in Quattro Pro for Windows lists

the date(s) and right-click on the selected area. A dialog box pops up with the Numeric Format category preselected; select User Defined at the bottom of the radio button list in the second panel. Press <Tab><Down> or click the down arrow in the third panel to open the Formats defined list. Choose TWeekday and click OK. Now when you enter a date into those cells, Quattro Pro for Windows displays the day of the week that date falls on.

46

Sweeping Changes

The three-dimensional notebook metaphor is a winner, but



FIND A HIDDEN LIST OF the files that were opened most recently in Quattro Pro for Windows.

the last ten files you opened. Click the down arrow on the right side of the File Name box or press the <Down> cursor key, and the list drops down. Click on the name of the file to open, and you're ready to work.

45

Name the Day

Want to know the day your birthday falls on this year? Quattro Pro for Windows obliges. To display the day of the week from a date, first select the cell or range where you will enter changing certain spreadsheet properties-for example, the grid line display-is tedious if you have to change it for each page separately. To make changes to the entire notebook, select Tools . Define Group. Type a name for the group of pages in the Group Name box. Type A in the First Page box and IV in the Last Page box. Turn on Group mode by clicking the G icon at the bottom of the screenyou'll see a blue line appear beneath all the page tabs and the G icon. Right-click any

page tab to bring up the property inspector dialog box, select Grid Lines, and uncheck the Vertical and Horizontal checkboxes that appear.

47

Instant Radio Buttons

Creating your own dialog boxes when building spreadsheet applications is a snap. And if you need plenty of radio buttons in your box, here's a way to them fast. make Select Tools • UI Builder to open a blank dialog box. From the SpeedBar, choose the Group Box tool icon (move the mouse pointer over the SpeedBar to find out what each icon does) and draw a box in the blank dialog box by dragging the mouse pointer. To fill this box with radio buttons, hold down the <Ctrl> key as you drag a handle to resize the box. The box fills with as many radio buttons as space allows. To delete some of the buttons, select the unneeded items (after picking the first one, you can hold down <Shift> as you select to pick more) and press < Delete>.

48

The Sound of Dialog in a Box

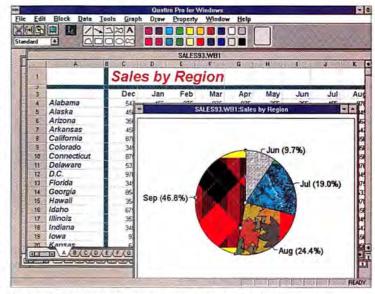
Want to make that custom dialog box sing—or rather, talk? To insert an OLE object-say, a brief verbal message warning users to save their files-select Edit • Insert Object and choose the program that created your object. The program will launch. Open the file you want to embed and close the program. When asked if you want to update the embedded object, click Yes. Then rightclick the object, select Object Name, enter a name for the object, and click OK. When you build your custom

dialog box with Tools • UI Builder, add a button and select Dialog • Links. Click the Add button to insert a link, and specify the link command ON Clicked DOMACRO (SelectFloat message) (OLE.Play). Substitute the name of the object for message. The only hitch is that the message must be located on the active page of the notebook—otherwise the program will not find it.

49

A Picture Is Worth a Thousand Bars

Charts can be boring. Fortunately, you can break out of old patterns by using graphic



USE ANY BIT MAP TO DRESS UP your charts in Quattro Pro for Windows.

images as chart elements. Create your graph as usual and right-click on a bar, pie slice, or marker to bring up the property inspector. Click on *Fill Style*, check the Bitmap radio button, and then click *Browse* to select a bit map file to use. Click *OK* when you have selected the file you want, then click *OK* again in the Properties dialog box. The selected chart element will be filled with pattern in the bit map file you selected.

50

Print Portions of Multiple Pages

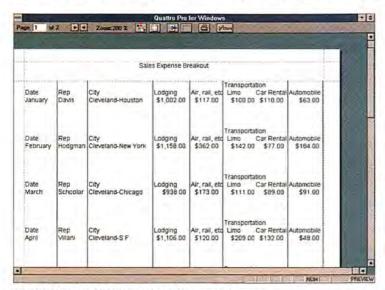
Say you have your monthly

budget set up so that you have one month per page in a single *Quattro Pro for Windows* notebook. What if you want to print only what you spent each year on travel? If all the pages are set up the same way, it's easy.

Select the block of cells you want to print on the first page. Hold the <Shift> key and click on the tab for the last page you want to include. A black line will appear under all the page tabs. Select

File • Print Preview to see all 12 ranges, one after another.

The following people contributed to this article: Nicholas Delonas is a computer consultant with Gasteiger & Delonas in Allston, Massachusetts; Jim Desmond is a computer consultant in Chicago; Shane Devonshire is a computer consultant in Walnut Creek, California; Rick Dobson is a computer consultant and author in Louisville, Kentucky; Anne Ehrenshaft is a technical information analyst at Oak Ridge National Laboratory in Oak Ridge, Tennessee; Cynthia Fitzgerald is an associate editor for PC World Lotus Edition; Elisabeth M. Hohne is an information services specialist for RISCorp of Florida; Wolf Kadavanich is president of the Southern California Quattro Pro Users Group; Donald E. Klamon is a San Francisco-based computer consultant specializing in spreadsheets; Stephen L. Nelson is a certified public accountant in Redmond, Washington, and the author of several computer books including The Power of Improv: Vincent O'Connor is a computer consultant in Babbit, Minnesota; John Walkenbach is a contributing editor for PC World.



PRINT PORTIONS OF MULTIPLE PAGES on a single page.

Custom Compaqs

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	
11588	ProLinea 4/33 with 240 MB, Windows,	
	Local Bus while supplies last \$1759	
10893	ProLinea 4/50 with 240 MB,	
	Windows while supplies last 1699	
11590	LTE Lite/25E with 120 MB, Windows 2999	
9552	Contura 3/25 with 120 MB, Windows 1599	
11453	Deskpro 4/25is with 120 MB, Windows 1499	

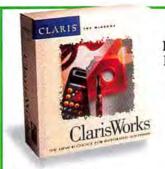
BUSINESS APPLICATIONS

	Approach Software
3830	Approach 2.0 for Windows Competitive Upgrade 95.
2729	Automap USA for DOS., 55, 8569 Windows,, 55,
2/29	Banner Blue Software
2088	Org Plus 2.0 for Windows
	Borland International
10616	Quattro Pro Win. (31/4" only) while supplies last 95.
10710	Paradox Windows (31/2" only) while supplies last 129.
11445	Paradox/Quattro Pro for Windows Bundle 189.
	Caere
8933	OmniPage Pro 2.1
	Claris Corporation
10996	ClarisWorks Win. 95. 5257 FileMaker Pro Win. 119.
5228	FileMaker Pro for Windows Competitive Upgrade 89.
	Concentric Data Systems
6575	R&R Report Writer DOS 159. 9236 Windows, 159.
	Contact Software
7435	ACT! for Windows 239.
	Intuit
2426	Addition and the pool of the principles and the
	Lotus
5653	The second secon
5417	1-2-3 3.4 (5416 3%") 399.
2755	1-2-3 4.0 for Windows (2756 3%*) 309.



Central Point Software

11394 PC Tools for Windows—The long awaited PC Tools for Windows incl.: a new Desktop, File Manager, Desktop Accessories, Backup, Anti-Virus, Data & Disk Recovery, & an Event Scheduler (11395 3½").. \$125.



NEW INTRO PRICE, ONLY \$95!

Claris Corporation

10996 ClarisWorks for Windows—The new choice for Windows integrated software, has full-featured word processing, database, spreadsheet, charting, & graphics capabilities seamlessly integrated to work together. \$95.



	GRAPHICS & DESIGN
	Adobe Systems
10774	Adobe Photoshop 2.5 for Windows (3% only). 548.
6591	Adobe Illustrator 4.0 for Windows (6439 3%*), 389.
7940	Adobe Type Set Value Pack (7941 31/2") 39.
1715	(Entire Adobe Type Library available)
	AGFA
10396	Discovery TrueType Pack
	Aldus
11033	FreeHand Windows Comp. Upgrd. (11034 31/2) 145.
11036	PhotoStyler Win. Comp. Upgrd. (11037 3%") 189.
11667	PageMaker 5.0 for Windows (31/2" only) (June) 579.
	Altsys Corporation
8675	Fontographer for Windows 3.5 (31/1" only) 259.
	Application Techniques
1214	Pizazz Plus 3.0 79.
	Ares Software
6030	FontManger 1.0.7 for Windows 89.
	Bitstream
8040	FaceLift 2.0 for WordPerfect 5.0/5.1 (31/2" only) . 69.
2089	MakeUp 1.1 for Windows
	Corel Systems
5506	CoreIDRAWI 3.0 (5508 3%*)
	DeltaPoint
5172	FreezeFrame 1.0 for Windows
	Fractal Design
7822	Sketcher 1.0 for Windows
	Inset Systems

HiJaak 2.1., 115. 3820 1.0 for Windows ... 115.

PrimeType 2.0 for WordPerfect.....

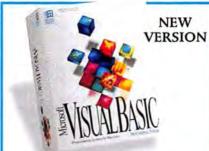
LaserTools



PROMO PRICE, ONLY \$119!

	Lotus
3523	Freelance Graphics 2.0 for Windows (5005 315") 349.
	Micrografx
3627	Windows Drawl 3.0 (3628 347)
	MicroLogic Software
5350	TrueType 1.0 for DOS 49. 8579 MoreFonts 3.0 75.
	Microsoft
10051	Font Pack 2 for Windows
3337	Publisher 1.0 for Windows
7387	PowerPoint 3.0 for Windows (8423 3%") 299.
	Shapeware
5426	Visio 1.0 for Windows (3%" only)
	Software Publishing
4403	Harvard Graphics for Windows (4402 3%7) 369.
	SYSTEM UTILITIES & PROGRAMMING

AddStor 8807 SuperStor Pro 1.0 .. Avery Dennison Label Pro 1.6 (Laser) **Baler Software Corporation** 11312 6649 Central Point Software Anti-Virus 1.4 (9555 3.5") or 8114 Backup 7.1 ea. 89. 11394 Fifth Generation Systems Direct Access 5.1.6 3950 Fastback Plus... 95. 6431 for Windows.... 95. Gibson Research SpinRite 3.1. Hewlett-Packard 8731 Dashboard 1.0 for Windows



Microsoft

1624 Visual Basic 3.0 for Windows Standard Ed.— Fast object oriented programming language & access to data make this the most productive way to go from idea to application..... \$129.5601 Visual Basic 3.0 Professional Edition... 299.

ship overnight?

	LaserTools
6882	PrintCache 3.1 \$49.
	Microsoft
11324	MS-DOS 6 Upgrd. (11325 3½") while supplies last 39.
7010	Windows 3.1 (7009 3½") 89.
1624	Visual Basic 3.0 Windows Std. Ed. (10154 3/4") 129.
5601	Visual Basic 3.0 Windows Pro. Ed. (10437 3/4") 299.
11444	Visual C++ Standard Edition (3%" only) 129. PC-Kwlk
8565	WinMaster 1.5 (8566 3¼")
4925	PC-Kwik Power Pak 3.0 w/Power Disk (8004 3%") 79. Personics
9288	Laptop UltraVision 2.1 (3½" only)
7539	386MAX 6.02 59. Quarterdeck
3221	Expanded Memory Manager 386 6.0 (3217 3%") 59.
4586	DESQview 386 2.4 (4585 3%*)
1409	Stacker 3.1
6397	The Norton Backup 2.2 for DOS (2356 3%") 99.
2359	The Norton Desktop 2.2 for Windows (2360 3%") 115.
3146	The Norton Utilities 7.0 (5136 3½") 115.
8378	Norton pcANYWHERE 4.5 (8535 31/2") 119.
11304	pcANYWHERE 1.0 for Windows (11303 3%) 129. Touchstone Software
11665	Check It Pro Set 1.0
8328	XTree 1.5 for Windows (8957 3%")
6161	XTree Gold 2.5
NET	WORKING/COMMUNICATIONS

3 Com lifetime (conditional)
EtherLink II/16 159. 3469 II/16 TP 169.
Artisoft
Lantastic AE-2 EtherNet Starter Kit 4.1 469.
AE-2 EtherNet Adapter Card
Caere
FaxMaster 1.0 95.
Cardinal lifetime
MVP24I Modern Value Pack
MVP96IF FaxModem Value Pack
CompuServe
Windows Membership Kit 1.0
Data Storm
PROCOMM PLUS 2.01 69. 6918 for Windows 99.
DCA/Crosstalk
Crosstalk 2.0 for Windows
Delrina Technology
DOSFax PRO 49. 2446 WinFax PRO 3.0 79.
Windows Communications PAK
Hayes 2 years
Accura 2400 (ext.) 69. 9033 (internal) 59.
ULTRA 96 Modem., 599, 5024 ULTRA 144, 669,
OPTIMA 24 Modem 115. 3522 OPTIMA 96. 349.
OPTIMA 24+FAX96
OPTIMA 144-FAY144 389



DeltaPoint

5172 FreezeFrame 1.0 for Windows-The "Must Have" graphics utility. Convert files, view and print, and screen capture. Also

includes an icon editor/creator, 300 hi-res clip-art and wallpaper images.....



SPECIAL **BUNDLE OFFER!**

Zoom Telephonics/Delrina Technology 4429 FaxModem VFP V.32bis Internal-Send & receive class one or two faxes at 14,400 bps. Both FaxModems provide V.42bis compression & MNP 2-5 error correction for up to 57,600 bps.......\$192. 4428 FaxModem VFX V.32bis External, 215. 2446 WinFax PRO 3.0-Makes it easy to send, receive & manage faxes from within Windows. Send faxes as easily as you print documents!...... 79. Combined they satisfy your total fax needs. 11649 WinFax PRO & FaxModem VFP V.32bis Internal 249. 11632 WinFax PRO & FaxModem VFX V.32bis External...... 269.

	Intel 3 years
10436	SatisFAXtion Modem/300 239
5994	Modem/400 399. 5995 Modem/400e 399
2994	EtherExpress 16 or 3021 16 TP ea. 129
	Megahertz 5 years
10514	P2144 14.4 Pocket Fax/Modem 379
10515	C5144 14.4 Fax/Modem (Compag LTE/Contura) 499
	Microcom
6234	CarbonCopy Plus 6.1 129. 4410 Windows 129
	Microsoft
6141	Windows for Workgroups Add-on (6172 3%") 59
	Norton-Lambert
2753	Close-Up Dual Pack 4.0 (2754 3/47)
	Practical Peripherals lifetime
3803	PM14400FX (internal modem/fax) 199
9234	PM14400FXPPM Pocket Fax/Modem 359
10570	PM14400FXMT (external modem/lax)
,	Prometheus 5 years
6444	Ultima Home Office (internal)
	Sofnet
5883	FaxWorks 2.5 (Windows & DOS) (3/4" only) 45
	Supra 5 years
11441	SupraFaxModem V.32bis Ext. for DOS 299
11442	SupraFaxModem V.32bis Ext. for Windows 299
	Technology Concepts 2 years
6315	Fax Line Manager 203 125
	TheComplete PC 2 years
8593	TheComplete Communicator Gold 389
0050	Traveling Software
4407	LapLink V
440.	Zoom Telephonics 7 years
1494	Ext. 9600V.32 195. 3075 Internal 179
4430	FaxModem AFX (2400 baud 96S/48R)
4429	FaxModem VFP V.32bis 14,400 baud (internal) 192
4428	FaxModem VFX V.32bis 14,400 baud (external) 215
7921	Pocket FaxModem
1321	T CONTT UNITED THE TAIL THE THE TAIL TH
	VIDEO & SOUND
	DEG & GGGIID

	11000000110	
	ATI Technologies 5 years	
8463	VGA Wonder XL24 149. 2012 Graphics Ultra	209
3886	Graphics Ultra + (with 2 MB)	339
3871	Graphics Ultra Pro (with 2 MB)	519
	Boca Research 5 years	
10468	SVGAX3 (with Bit BCT acceleration)	149
8380	BasicVGA 49. 8381 SuperVGA	115
	Creative Labs 1 year	
5770	Sound Blaster 16	229
10906	VideoSpigot for Windows	429

800-800-0003



PC Connection **693PCW** 6 Mill Street Marlow, NH 03456 ES 603-446-0003 FAX 603-446-7791

	Diamond Computer 5 years
11461	SpeedStar Pro 125. 10079 Stealth 24 165
11306	Stealth Pro 1 MB 249. 11305 2 MB 339
	Hauppauge Computer 1 year
10593	Win/TV, Microsoft Video for Windows Bundle 459
	Intel 3 years
11587	Smart Video Recorder
	KOSS Corporation 90 day
11323	HD-4 speakers (with equalizer & AC Adaptor) 55
	MediaVision 1 year
5637	ProAudio Spectrum 16 (3 yr.) 199
11478	ProMovie Spectrum 299. 10735 CDPCXL 1099
	NEC 2 years
4252	MultiSync 3FGX Monitor (14")
4249	4FG Monitor (15") 799. 3151 5FG (17") 1449
	Video Seven 7 years
7362	WIN.VGA 1 MB 129. 9261 WIN.PRO 1 MB 179

INPUT/OUTPUT

	Caere 1 year	
8158		299.
	Canon 1 year	
	We are an authorized Canon Service Center.	
7809	BJ-200 BubbleJet Printer	355.
9037	BJ-300 469. 9038 BJ-330	529.
	CoStar 1 year	
10300	Address Express	689.
	Epson 2 years	
11495	Stylus 800 (1 year warranty)	379.
5555	AP-3250 (80 col., 200 cps, 24 pin)	199.



Supra ... 5 years

SupraFaxModem V.32bis—Features 14,400 bps fax and data. Comes with choice of DOS or Windows software. External includes cable. DOS: 11440 Int. \$219. 11441 Ext. \$299. Windows: 11443 Int. 219, 11442 Ext. 299.



Microtek ... 1 year

5187 ScanMaker II-The ScanMaker II and the superfast ScanMaker IIxe offer affordable ways to capture 24-bit color or 8-bit grayscale images at up to 1200 dpi \$879. 5175 ScanMaker IIxe with PhotoStyler 1099.

2358	LQ-570 (80 col., 252 cps)		
10784	Action Laser 1500 (1 MB)		
10752	ES600C Color Scanner(requires interface kit). 895		
	Hewlett-Packard 1 year		
7621	DeskJet Portable		
6442	LaserJet 4 (with toner)		
	Kensington Microware 1 year		
7899	Expert Mouse serial 99. 7900 bus 115		
	Key Tronic 3 years		
4518	101 Plus Keyboard		
4387	Trak 101 Keyboard (with trackball) 165.		
	Logitech limited lifetime		
3996	Trackman2 (combo) 79. 2343 Portable 99.		
3295	Mouseman (combo) 69. 9766 (cordless) 89.		
	Microsoft lifetime		
7597	Microsoft Mouse (bus or serial) 85		
1896	Ballpoint Mouse (serial only) 119		
2898	Mouse with Windows 3.0 (bus or serial) 149		
	MicroSpeed 1 year		
6007	PC-TRAC Trackball serial 75		
	Microtek 1 year		
5187	ScanMaker II 879. 5175 ScanMaker IIxe. 1099.		
	Mouse Systems lifetime		
7878	PC Mouse III (serial) 69. 5427 NewMouse 62		
	Mustek 1 year		
B452	Gray Artist for Windows (256 GS hand scanner) 165.		
	Okidata 1 year		
5093	OL400 Laser Printer 649		
9590	OL810 Laser Printer		
	Pacific Data lifetime/60 day MBG		
5729	ProTracer (personal CAD printer) (1 yr.) 1099		

ACCESSORIES

	American Power 2 years					
7108	Smart UPS 400	339.	7105 Smart 600	439		
3819	Back-UPS 250	115.	3858 Back 400	179		
7107	Back-UPS 450	215.	3823 Back 600	295		



Prometheus ... 5 years

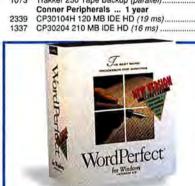
6444 Ultima Home Office-Internal, integrated communications system. 14,400 modem, send/receive fax and digital voice messaging, featuring MaxFax voice/fax software... \$289. 7776 Home Office Modem (internal) 179.

	Curtis lifetime
7358	Command Center SPF-4\$79.
1,5-5-6	Cyrix Corporation 5 years
9875	FasMath 83D87-25 or 9876 83D87-33 ea. 89.
	Intel 3 years
4750	80387SX 79. 5409 80387DX 85.
11.51	I/O Designs Ilfetime
8121	Ultimate Laptop SL 52. 8113 Ultimate Laptop EX 59.
11371	Ultimate Laptop XL Carry Case
	Kensington Microware 1 year
	Full line available. Partial listing.
2582	MasterPiece Plus 95. 2587 Remote 105.
10748	
10410	NoteBook Traveler PC Deluxe Case 75.
	PC Power & Cooling 2 years
9537	CPU Cooler (for 386/33 up to 486)
3203	Turbo Cool 200 149. 7915 Turbo Cool 300 159.
	Targus lifetime
1305	Universal Notebook Computer Case 69.
11207	Leather Notebook Computer Case 89.
	Tripp Lite 2 years
6199	Isobar 4-6 (4 outlets, Gold Seal Warranty) 49.
6200	Isobar 6-6 (6 outlets, Gold Seal Warranty) 59.
9312	BC500 Power Backup 219.
	DRIVES

Colorado Memory Systems ... 1 year

Jumbo 250 Tape Backup. Trakker 250 Tape Backup (parallel).

1073



WordPerfect Corporation

WordPerfect 5.2 for Windows-Ships with Grammatik 5, ATM, & twelve new fonts. 6228 WordPerfect Competitive Upgrade., \$99. 4786 WordPerfect Version Upgrade 79. 3494 WordPerfect 5.2 for Windows 279.

_		
	IOMEGA 1 year	
6499		659.
10452	Transportable MultiDisk 150	849.
6344	PC Powered 90 PRO (includes PC2B,	
		599.
10537		799.
10457		699.
2530	90 MB Cartridge 149. 2467 Tripak	439.
8480		199.
8481		209.
10702	Tape250 Parallel Port Tape Backup	429.
8482		319.
	NEC 2 years	
6582	CDR74-1 Portable CD-ROM Drive	629.
6581	CDR84 Internal CD-ROM (regs. interface)	569
	Quantum 2 years	
8287	Plus Hardcard II XL 105 MB (9 ms)	279.
4735	Hardcard EZ 127 MB IDE (17 ms)	329.
4714		549.
	TEAC 1 year	
6951	1.2 MB Drive for AT	59.
4670	1.44 MB Drive (3½")	55.
4326	1.44 MB Drive (31/3", with Bastech)	75.
4414	31/2"/51/2" Dual Floppy Drive	
	MEMORY	
1411	1 MB x 9 SIMMs (70 nanosecond)	call
2497	4 MB x 9 SIMMs (80 nanosecond)	
5746	1 MR Chins (80 nanosecond, set of 0)	call

Boca Research ... 5 years

BOCARAM/AT PLUS (2 MB)

239.

I/O Board for AT., 49. 6999 for PS/2.

7138 (8 MB)

(4 MB)

7139



\$784 FREE SOFTWARE VALUE!

Intel ... 3 years

429

349.

11587 Smart Video Recorder-Power and performance! Fifteen times faster for one-step capture and compression of 1/4 screen video onto one-fifth the hard disk space...... \$499.

	Intel 3 years
1086	
8479	Above Board ISA ØK 17
	Pacific Data lifetime/60 day MBG
	Memory upgrade for LJ IIP, III, IIID, IIIP:
7055	2 MB 119. 7759 4 MB
7959	4 MB Upgrade for LaserJet 4 16
	DISKS/MEDIA
	DISKS/WEDIA
2214	Fuji lifetime 3½ DS Disks (10) 9 2242 (50) 3

31/2" HD Disks (11)..... 13. 2241 (50)..... 31/2" HD Disks (20) with storage case Sony ... lifetime 51/4" HD Disks (10) ... 31/2" DS Disks (10)..... 3298 31/2" HD Disks (10)..., 14. 6375 (30)... QD2040... 1895 QD2120 8185 ... 14. 3M ... lifetime DC2120..... 1581 22. 11013 (3 pack) 60. Toshiba ... lifetime

OUR POLICY

3½" 2.88 MB ED Disks (5)... 17. 9755 (10) ... 29.

- 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, Manufacturer support and upgrade eligibility may be limited outside the U.S.A.
- 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).

 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 week days 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.



PC CONNECTION

YOUR SOURCE FOR PC SOFTWARE AND PERIPHERALS.

MARLOW, NEW HAMPSHIRE

W E H A V E

3YEAR WARRANTY NO FOOLIN'!

FAST SHIPPING

AND WAIT TIL YOU SEE THE PRICES!



Shopping For PCs Just

The most reliable computers. The most reliable source.

Since 1982, PC Connection has been setting the standards for computer mail-order from the village of Marlow, NH (pop. 0.0006 million). Since 1983, Compaq has been setting the stan-

dards for PC-compatibles from the city of Houston (pop. 1.6 million). It's an unbeatable combination.

Besides the prices (real low), and the shipping (real fast), and the service (real complete), and the

PC CONNECTION COMPAQ HOTLINE 800-998-0003

Low Prices. Delivered.

Some companies lead with a low price and then they hammer you on freight. But we charge \$5 *total* for overnight delivery for your entire order. So when comparing prices, always check the *delivered* price. Then call us!

3-Year Warranty.

Check the warranties on other computers. No matter how deep you dig into the fine print you probably won't get past 1 year. The warranty on our Compaq computers is a full 3 years. *And the first year of service is on site.*



Got Easier.

Ready to run. Overnight.

support (unreal), we can offer you something no one else can: two companies that have been in this business from the beginning and will be standing behind that new computer of yours for years to come.



OVERNIGHT SHIPPING \$5

Pre-Installed Hardware.

Purchase any of the following internal components to customize your Compaq system and we'll install them at no extra charge! See "Additional Hardware" boxes on the next few pages for details.

- ▶ Additional Floppy Drive
- ▶Bernoulli Drive
- ▶ Math CoProcessor
- ▶ Tape Backup
- Modem

Everything Overnight® \$5.

It's the best deal in the business. The entire freight charge for your order is just \$5, no matter how much you buy or how much it weighs. Approved orders placed by 3 a.m. for in-stock systems go out right away for next-day delivery. Orders for systems with pre-installed hardware or software (see above) must be placed by 10 p.m. ET (weekdays) for next-day delivery.*

Pre-Installed Software.

Purchase any of the following software programs with your Compag system and we'll load them at no extra charge! And, while we're at it, we'll even install and de-compress Windows-saving you a good chunk of valuable time. Your machine will arrive totally ready to run.

0020	ND ACCOSTOL WILLIAMS909.
7811	MS Word for Windows299.
5680	MS Excel for Windows 299.
8423	MS PowerPoint299.
2735	MS Works for Windows 129.
8138	MS Office for Windows449.
5238	MS Word 5.5209.
4348	MS Works95.
10059	MS FoxPro for DOS299.
WordPe	erfect
3497	WordPerfect for Windows 279.
3795	WordPerfect for DOS265.
7582	WordPerf. Presentations279.
Borland	
1205	Paradox529.
10710	Paradox for Windows129.
10805	Quattro Pro\$95.
10616	Quattro Pro for Windows95.

8326 MS Access for Windows \$80

Lotus		
2756	1-2-3/ Windows	309
5416	1-2-3/ DOS Release 3.4	399
5652	1-2-3/ DOS Release 2.4	335
5799	AmiPro for Windows	239
5005	Freelance for Windows	349
5982	SmartSuite	469
Delring	1	
10936	WinFax PRO 3.0	79
Crossto	ılk	
5611	Crosstalk for Windows	119
Symon	tec	
2360	Norton Desktop/Windows	5115
Applica	ation Techniques	
10950	WinDings - free with any	other
pre-in	stalled software listed abov	e.

PC Connection/CompaqCare Warranty & Service Plan

- 3-Year Limited Warranty covering all Compage parts and labor.
- On-site 2nd-business-day service during Year 1 (available in all but remote locations). "Carry-in" service for Years 2 & 3: You can either return your computer to us or take it to any of the 2,000 authorized Compag service locations.
- 30-Day money-back guarantee from PC Connection.

- Toll-free technical support from us (M-F 9 a.m-5:30 p.m. ET) and Compaq (7 days/24 hours).
- COMPAQ Forum on CompuServe.
- PAQFax: information by fax 24 hours a day.
- Optional service/warranty upgrades and self-maintenance programs also available.



The prices are way down. The speed is way up!

here have been price reductions throughout the ProLinea line. And the ProLinea 4/33 now features local bus graphics so it's two to five times faster (equivalent to the Dell ME line) at a better price than ever! These full-featured desktop PCs come complete with MS-DOS 5.0 and Windows 3.1 ready to run, and we'll install and test any of the "Additional Hardware" listed below at no extra charge. Order your customized Compaq any weekday by 10 p.m. and we'll still ship it for next-day delivery for only \$5.*

ProLinea Features:

- Local bus 1024 x 768 video with 1 MB VRAM/256 colors (4/33); 1024 x 768 VGA (4/50)
- The 4/33 is upgradable using OverDrive or VersaChip processors.
- 3.5" 1.44 MB floppy drive
- 101-key keyboard and mouse
- Three 16-bit ISA expansion slots
- 145-watt power supply
- Two serial and one parallel port

	onal Hardware lled and tested at no extra charge	
4194	Colorado Jumbo 120 Tape Backup	\$149
4354	Colorado Jumbo 250 Tape Backup	215
10941	Practical Peripherals 2400 data, 9600 S/R	
	internal fax/modem	95
10942	Practical Peripherals 14,400 data, 9600 S/R	
	internal fax/modem	199
	Iomega Bernoulli Insider 90 MB PRO	579
6951	Teac 1.2 MB Floppy Drive	59
10744	Kingston 4 MB memory upgrade	179
10743	Kingston 8 MB memory upgrade	395
Note: A	Il Compaq hardware options (drives, modems, etc.) le from us. Call for more information.	are also



ProLinea 4/33

33-MHz 486DX; 4 MB expandable to 32 MB

11588	Model 240/w+ 240 MB Hard Drive, PFS:	
	WindowWorks, 5 ¹ / ₄ " Drive, Modem (2400 data, 9600/4800 S/R fax), Prodigy	¢1750
	9600/4800 S/R fax), Prodigy	
10844	Samsung SyncMaster 15" Color Monitor	499
10698	Compaq SVGA 14" Color Monitor	349
	Intel Overdrive	

ProLinea 4/50

50-MHz 486DX2; 4 MB expandable to 32 MB Non-local bus; Special Price! (while supplies last)

10893 Model 240/w 240 MB Hard Drive	51699
10844 Samsung SyncMaster 15" Color Monitor	499
10698 Compaq SVGA 14" Color Monitor	

'Here's that fine print again: Continental U.S. only. Includes Saturday delivery in many locations. Remote locations may require an extra day.

DESKPRO/i '486

as low \$1499

(monitor not included)

The New Price/Performance Standard For Desktop PCs.

he DESKPRO/i series delivers the latest high-performance features including an integrated QVision 1024 Graphics Controller which *PC Magazine* praised for its "incredible performance—among the fastest we've seen for any system." You also get Compaq's exclusive VersaChip Upgrade Architecture which can take you as high as the new 486DX2/66 (when available), built-in audio capability for recording business messages, and more. All in a small footprint at a small price.

DESKPRO/i Features:

- QVision 1024 Graphics with up to 256 colors and resolutions up to 1024 x 768
- Business audio system including microphone, speaker, and software (not for games)
- 3.5" 1.44 MB floppy drive
- 101-key keyboard and mouse
- MS-DOS 5.0 and Windows 3.1
- Three 16-bit ISA expansion slots
- 145-watt power supply
- Serial and parallel port

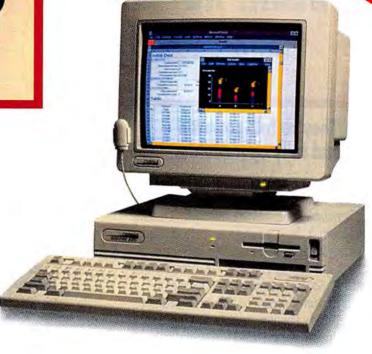
Additional Hands

Compact footprint: 15.9"W x 15.1"D x 4.0"H

	led and tested at no extra charge	
10959	Kingston 1 MB memory upgrade	\$69
	Kingston 2 MB memory upgrade	
10961	Kingston 4 MB memory upgrade	169
10962	Kingston 8 MB memory upgrade	379
5409	Intel Math CoProcessor 80387DX	85
	Colorado Jumbo 120 Tape Backup	
4354	Colorado Jumbo 250 Tape Backup	215
10942	Practical Peripherals 14,400 data, 9600 S/R	
	internal fax/modem	199
6502		
6051	Tear 1 2 MB Flonny Drive	50

Note: All Compaq hardware options (drives, modems, etc.) are also

available from us. Call for more information.



DESKPRO 4/25is

25-MHz 486SX; 4 MB expandable to 32 MB

11453	Model 120/w 120 MB Hard Drive
11452	Model 240/w 240 MB Hard Drive\$1679
	Mag Innovision MX15 15" Color Monitor599
4249	NEC 4FG 15" Color Monitor
10844	Samsung SyncMaster 15" Color Monitor
10694	Compaq QVision Color Monitor
	Intel Overdrive479

Shift into Overdrive!

Some ProLinea and DESKPRO machines are designed so you can upgrade to more powerful processors including the new **speed-doubling** DX processors as they become available (and as your needs grow). Note: while upgrading gives you the full processing power of a machine built around that chip, it's important to remember that performance does depend on other factors such as amount of RAM, hard-disk speed, and the applications being used.

*More fine print? Oh no! Oh yes! Because the boss wanted us to remind you that we'll install and test the additional hardware listed on the left or the software on the first page of this ad at no extra charge. And, if you order your customized Compaq any weekday by 10 p.m. ET, we'll still ship it for next-day delivery. With, of course, the usual caveats: Continental U.S. only. Includes Saturday delivery in many locations. Remote locations may require an extra day.



They're full-powered and fully upgradable.

Compaq's DESKPRO/M computers are designed to be upgradable. They feature a modular system design in which the key subsystems are divided into five separate boards: processor, memory, video, I/O, and EISA bus boards, all of which are upgradable. So, for example, if you need more power in the future, you'll be able to move right up to Intel's new Pentium processor as it becomes available. In fact, these DESKPRO/M machines won *PC Magazine*'s Editors' Choice (12/8/92) for Upgradable PCs and the DESKPRO 66M also won an Editors' Choice (12/22/92) for Technical Excellence.

The DESKPRO/M models we offer feature Compaq's own QVision Graphics Controller that has a built-in 32-bit graphics accelerator. And they include a business audio system (microphone, speaker, and software) for incorporating audio into your multimedia applications.

DESKPRO/M Features:

- QVision Graphics Controller with 512K standard, upgrades to 1MB for 1024 x 786 (256 colors) support
- Built-in business audio system for voice annotation, audible proofing, and voice recognition
- Five 32-bit EISA expansion slots (four available after maximum memory installed)
- · Four internal bays for storage devices
- 3.5" 1.44 MB floppy drive
- Ports: one parallel, two serial, mouse, external VGA, audio adapter with input/output jacks
- MultiLock security features
- 240 watt power supply with automatic line switching
- . MS-DOS 5.0 and Windows 3.1



DESKPRO 4/66M

66-MHz 486DX2; 8 MB expandable to 64 MB

11646 N	Todel 510/w 510 MB Hard Drive	9
	ag Innovision MX15F 15" Color Monitor	
4249 N	EC 4FG 15" Color Monitor	799
10844 Sa	amsung SyncMaster 15" Color Monitor	499
10694 C	ompaq QVision 170 17" Color Monitor1	146

DESKPRO 4/50M

50-MHz 486DX2; 8 MB expandable to 64 MB

11644	Model 340/w 340 MB Hard Drive	\$3349
	Model 120/w 120 MB Hard Drive	
10063	Mag Innovision MX15F 15" Color Monitor	599
4249	NEC 4FG 15" Color Monitor	799
10844	Samsung SyncMaster 15" Color Monitor	499
10694	Compaq QVision 170 17" Color Monitor	1146

DESKPRO 4/33M

33-MHz 486DX; 4 MB expandable to 64 MB

*Remember—how could you forget?—that we'll install and test the software listed previously at no extra charge. And, if you order your customized Compaq any weekday by 10 p.m. ET, we'll still ship it for next-day delivery. With, of course, those same old delicious caveats: Continental U.S. only. Includes Saturday delivery in many locations. Remote locations may require an extra day.

PC World World Class Award/ Best Mail Order Company

We're not trying to win any popularity contests. (But we did!)

1990

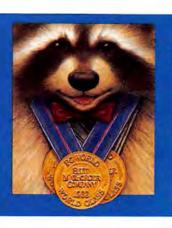
- 1. PC CONNECTION
- 2. CompuAdd
- 3. Dell Computer
- 4. Telemart 5. Gateway 2000

1991

- 1. PC CONNECTION
- 2. CompuAdd
- 3. Telemart
- 4. Gateway 2000
- 5. Dell Computer

1992

- 1. PC CONNECTION
- 2. Gateway 2000
- 3. Dell Computer
- 4. Tiger Software
- 5. Micro Warehouse





Crystal-Clear Resolution. Any Time. Any Place.

The LTE Lite is the ultimate in notebook technology—winner of a *PC Magazine* Editors' Choice Award and *PC User Magazine* Gold Award (3/10/92). With its dazzling VGA display and the unique EasyPoint Trackball, this compact 6.4 lb. powerhouse is the perfect choice for people who don't want to sacrifice performance when they go on the road.

Additional Hardware/Accessories* No additional charge for installation (where required)

6569	Intel Math CoProcessor 80387SL	\$79
	Colorado Trakker 250 Tape Backup (parallel)	
	Kingston 2 MB memory upgrade	159
	Kingston 4 MB memory upgrade	
	Kingston 8 MB memory upgrade	
	Megahertz 2400 data, 9600 S/R fax (int.)	
	Megahertz 9600 data, 9600 S/R fax (int.)	
	Megahertz 14,400 data, 14,400 S/R fax (int.)	
	Compaq NiMH Battery	
10670	Compaq NiCd Battery	121
10662	Compaq Auto Adapter	93
	Compaq External Battery Charger	
	Compaq Quick Connect	
	Compaq Desktop Expansion	
	Kensington MicroSaver (security device)	
	Ill Compaq hardware options (drives, modems, etc.)	
	le from us. Call for more information.	ure uiso



LTE Lite 3/25c (Color)

25 MHz 386SL; 4 MB expandable to 20 MB

LTE Lite 3/25e

25 MHz 386SL; 4 MB expandable to 20 MB

LTE Lite Features:

- 3/25c: 8.4" Active Matrix Color VGA display with 640 x 480 capability (256 colors from a palette of 4,096)
- 3/25e: Active Matrix B&W 9.5" VGA display upgradable to Active Matrix Color VGA display
- 3.5" 1.44 MB floppy
- 79/80-key keyboard with isolated, inverted "T" cursor keys
- · Built-in EasyPoint Trackball
- NiMH Power Smart Pack with 3-4 hour life
- . MS-DOS 5.0 and Windows 3.1

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 faxon-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 INCORPORATED 1919 OLD DENTON ROAD • SUITE # 104 CARROLLTON, TEXAS 75006 • Office; 214 / 242-9696 • Fax: 214 / 245-0942 NISCA CORPORATION, KOFU, JAPAN

Windows NT:

Microsoft's robust new operating system may put DOS out to pasture someday, but not in 1993.

The New DOS?

BY NOW YOU MAY HAVE HEARD that Windows NT is either an overpriced and hardware-intensive boondoggle or the environment that *Windows*, DOS, OS/2, and even UNIX should have been all along. In truth, it's a little of both. Technically, NT's a wonderful operating system that combines the familiar *Windows* interface with a robustness and

reliability that the rickety old DOS-Windows combination can't match. But NT requires a powerful computer to work properly, and some compatibility issues still need to be worked out.

In other words, don't run out and upgrade without giving it some careful thought.

By Scott Spanbauer



We described Windows NT's core features in depth last year (see "Windows NT: A DOS for the '90s," December 1992). NT's multitasking, we noted, is considerably more dependable than Windows 3.1's, and applications can be more responsive. NT is both a network and workstation operating system, with many security features built in. File names need not be limited to eight plus three characters. And since NT doesn't have to sit on top of DOS, it's less prone to crashing and can address all of a computer's memory directly.

While most features remain unchanged in the March 1993 beta version we examined, Microsoft has added some modular functions, including TCP/IP protocols for connecting to UNIX networks, and a tool to let remote users dial in to, use, and even manage an NT network. As we went to press, Microsoft was predicting that NT would hit the streets before July and cost less than—gulp—\$500.

Worth the Price?

Even if Windows NT debuts at a bargain price, will it be worth it? The program can take up as much as 70MB of hard disk space *before* you add applications and data, and it requires a bare minimum of 8MB of RAM. In addition, it may not adequately support your video, network, and other adapters and, more important, your key applications. Finally, how will Windows NT applications—when they appear—improve on *Windows 3.1* programs?

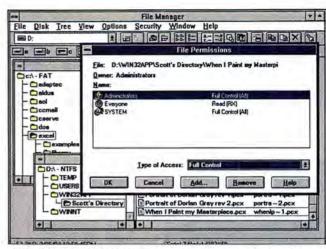
NT is a 32-bit operating system and requires a 32-bit processor, specifically a 386, a 486, Intel's new Pentium, or a MIPS R4000

R4400 RISC chip. A version will also ship for the 64-DEC Alpha AXP. Microsoft says applications written to run in this 32bit-memory nirvana will be faster because they'll perform calculations and access memory-up to 4 gigabytes of it-using one processor instruction instead of doing it piecemeal as DOS (and with

it, Windows 3.1) does. The speedup could be as much as 20 percent over equivalent 16-bit processes, the company says, depending on the nature of the application. This remains to be seen, since no such applications are currently available for testing. It's important to note that you'll be able to run most forthcoming 32-bit Windows programs under Windows 3.1 and that they may perform just as well there-although without NT's other advantages. Since Windows NT handles all the RAM in your system the same way, it offers at least one clear advantage: Unencumbered by DOS's 640K memory limit, you may never have to worry about extended, expanded, conventional, and upper memory again.

Windows' multitasking has always left a lot to be desired, but with NT those desires finally get fulfilled. Part of the reason is preemptive multitasking. In Windows 3.1's non-

> preemptive model, the program currently using the processor decides when to relinquish control. This scheme is usually fine for downloading a file or sorting a large database in the background, but it can break down under conditions that require the computer to respond to external events in a timely fashion-such as answering a fax-mo-



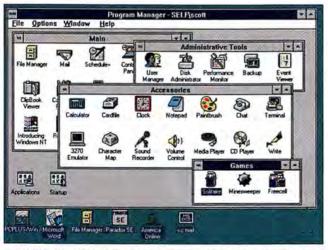
WINDOWS NT'S FILE MANAGER resembles the one in Windows for Workgroups but offers security controls and long file names.

dem or serving a network. With Windows NT's preemptive multitasking, the operating system decides when to allow access to the processor and can turn it over to higher-priority programs when they demand it. In Windows 3.1, applications that freeze up while in control of the processor bring the whole system to a halt until you remove them from memory (by pressing <Ctrl>-<Alt>-<Delete>). Theoretically, such a seizure will never occur in Windows NT.

NT also boasts multithreading, in which an application performs its tasks in separate, concurrent "threads" rather than in one sequential queue. This capability can improve overall performance and provide a more responsive user interface. For example, a multithreaded word processor would allow you to continue working while it formats a 20-page report for the printer. By contrast, a single-threaded *Windows* program would not let you open a document while it is formatting another.

It may be a while, however, before multithreading appears in many commercial applications. Multithreaded programs are more difficult to design and write, so vendors will probably be slow to offer them. What's more, multithreading is not part of the Win32s API, the subset of NT programming instructions that allows 32-bit applications to run under Windows 3.1. Developers looking to build applications that run under both types of Windows may skip multithreading entirely.

Windows NT's user interface, identical in most ways to Windows 3.1's, is a prime ex-



IT'S WINDOWS, RIGHT? Wrong. Windows NT looks like Windows 3.1, but note the computer and user names and other differences.

ample of multithreading's benefits. Under Windows 3.1, when you click on an icon to launch an application, you can't do anything else until the application has finished loading. By contrast, Windows NT allows you to click on other icons or switch to another application and continue working while the application loads.

For high-end systems that have more than one CPU, NT supports symmetric multiprocessing, which divvies up processing tasks among multiple CPUs, further boosting a system's responsiveness. A number of manufacturers, including Acer, ALR, AST, Compaq, Hauppauge, and NCR, have announced or already shipped multiprocessor systems tailored to Windows NT. The combination of preemptive multitasking, multithreading, and multiprocessing could make Windows NT a killer network or application server running, say, a multithreaded SQL database back end. Windows NT could compete with minicomputers for sensitive, transaction-intensive applications such as order entry and billing systems.

But back to the desktop. Until 32-bit applications come along, you'll be running your same old DOS and 16-bit Windows programs, as well as character-based OS/2 1.3 and POSIX-based UNIX applications. You can launch any of them from a Program Manager icon or from NT's command shell-a highly realistic rendition of the DOS prompt that provides new-and-improved versions of familiar DOS commands and a few badly needed new ones. There are commands for changing directories and then easily returning to the directory you left, and there's a much more powerful file searching program than the one that comes with DOS.

At some point last year, Microsoft made the mistake of stating it would test the top 100 DOS and Windows applications to make sure they ran under NT. Now the company simply says that NT will run "hundreds" of applications without trouble and that it won't be publishing a specific list of compatible programs. In fact, the latest beta version of Windows NT ran every DOS and 16-bit Windows application I threw at it, with one exception: WinFax Pro, which could neither send nor receive a fax.

Microsoft says no existing 16-bit fax driver will work with Windows NT, and it suggested we contact the fax software manufacturer to find out when new drivers would appear. Delrina Technology, maker of Win-Fax Pro, stated its intention to support Windows NT but couldn't say when a version would appear. If you rely on a fax-modem, this simple lack of a driver is enough to prevent you from adopting Windows NT; no matter how attractive its many other features are.

The bottom line is that NT won't allow applications to manipulate hardware direct-

A multithreaded word processor would allow you to continue working while it formats a 20-page report for the printer.

ly—they must use a virtual-device driver, which allows NT's security layer to confirm that the program isn't a virus, a hacker, or a politician. As a result, getting scanning software, for instance, to work under NT is an iffy prospect, and programs whose main purpose is to blatantly "touch" hardware, such as disk optimizers, are out.

Heavy Metal, Please

The hardware price for N'T's power is steep. In addition to a fast 32-bit CPU, you'll need a minimum of 8MB of RAM. The beta version recommends 16MB, a number Microsoft says may shrink in the released product. You'll also need at least 70MB of free hard disk space to install the operating system. Add in more space for all your existing applications, and even a 200MB hard disk will fill up quickly.

Device drivers written for Windows 3.1

won't work with NT, and that's a problem. Windows NT comes with drivers for quite a few video adapters, mostly newer ones. Older super-VGA boards, such as the Tseng ET3000based Orchid Pro-Designer Plus, may be limited to 640 by 480 VGA mode until manufacturers decide it's worth the trouble to write NTcompatible drivers. (Microsoft says NT will ship with drivers for most ET4000- and S3-based boards,)

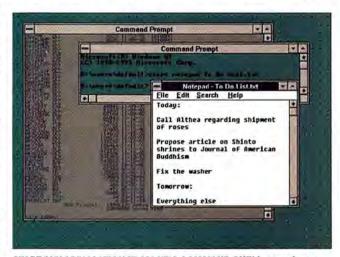
Microsoft can't or won't promise to support every piece of hardware under Windows NT and relies mostly on manufacturers to write their own drivers. A final list of supported hardware was unavailable as we went to press, but an NT product manager suggested that NT will come with drivers for most devices that Windows 3.1 supports.

> If NT is successful, of course, hardware manufacturers will scramble to rewrite drivers for all their video boards, network adapters, and other devices. In the meantime, though, users will have to struggle.

Getting It Going

Installing Windows NT from a CD ROM (like OS/2, it will also be available on a score or so of floppies) starts out much like a Windows 3.1 installation. The first major difference comes when the system asks you to pick a file system: DOS's File Allocation Table (FAT) system, or the NT File System (NTFS), which allows long file names, provides sophisticated file security, and uses the hard disk more efficiently.

If you're installing NT over an existing DOS partition, you have the option of replacing the FAT system with N'TFS without destroying existing files. You can also install a foolproof multiple-boot utility that lets you choose whether to run DOS or Windows NT at boot-up. And if you install Windows NT over Windows 3.1, NT's set-up program will copy many of the settings in your Windows WIN.INI file to a separate



START ANY APPLICATION FROM NT'S COMMAND SHELL, or review a long directory listing with its handy scroll bars.

Exactly how fast is graphics performant lmage Series PCs?

Let's just say we developed Image Video™ technology expressly for all you high-performance speed demons. Fact is, we've engineered our Image™ Series PCs with a power-

1

NEC has the ultimate system for graphics applications: lightning-quick Image Series PCs with integrated SCSI II interface, legendary MultiSync FG monitors, and our pioneering CD-ROM readers with MultiSpin™ technology.

ful combination of our secondgeneration local bus and graphics accelerator, allowing graphics information to travel directly between the CPU and video m e m o r y , s o

Windows' is a breeze and you can sprint through today's most demanding graphics applications.

Based on Intel's powerful 486 chip, each Image Series PC has OverDrive' capability for easy processor upgradability. An on-board SCSI II interface means you can quickly connect to a wide variety of peripherals. And with our new OptiBus™ technology, your peripheral performance is up to 30% faster than ordinary systems. We've even made it easier for you to network



your PCs with an optional factoryintegrated, high-performance 10BaseT Ethernet® adapter.

Plus, every Image Series PC is designed with True Color support of up to 16.8 million colors for photorealistic images, as well as our exclusive ImageSync™ technology for flawless performance when connected to our award-winning

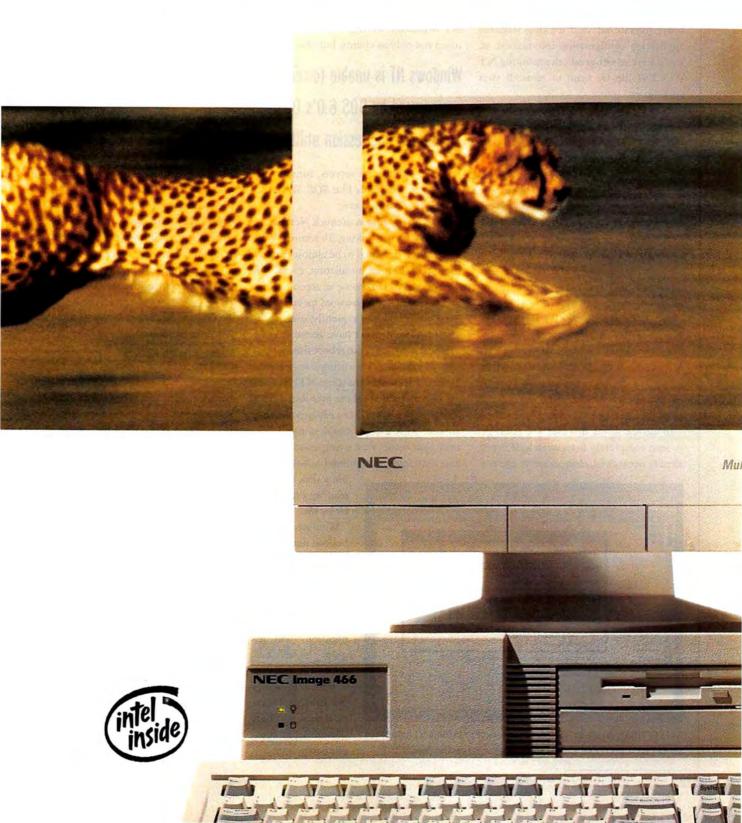
MultiSync* FG™ series monitors. The result? Clear, flicker-free images without any adjusting.

So call 1-800-NEC-INFO (in Canada, 1-800-343-4418), or NEC FastFacts™ at 1-800-366-0476 (# IMAGE). Then hold on to your spots.

Because **\underline{\uneq\underline{\underline{\underline{\underline{\underline{\underli**



the e of NEC's





Windows NT WIN.INI used when running 16-bit Windows programs.

Unfortunately, Windows NT is unable to read partitions compressed by DOS 6.0's DoubleSpace or any other compression utility (it can read compressed volumes across a network, of course). If you're currently keeping data on a compressed partition, you'll have to either decompress your files first or install NT somewhere else. Installing NT on a fresh partition means that it won't migrate all your existing Windows application configuration information, so you'll have to either edit the resulting NT WIN.INI file by hand or reinstall your applications.

Windows NT: The Network

Windows NT was built from the ground up to network. A special version, Windows NT Advanced Server, is a powerful network operating system intended to compete with Novell NetWare. But the plain, desktop-oriented Windows NT can handle small networks itself.

Go out and buy 20 486-33s, 20 network adapters with cabling, and 20 copies of Windows NT, and you have an instant network—all you have to do is name your work group. Like Windows for Workgroups, NT even bundles in Microsoft Mail and the Schedule+ group calendar. If you believe Microsoft, individual users (assuming they're not computer impaired) will be able to install and configure Windows NT in a snap, then get right to work.

In the real world, however, you rarely get to start completely from scratch. If you're already networked, chances are you're running Novell NetWare, and few companies will scrap their corporatewide NetWare LANs on Friday, install Windows NT over the weekend, and pick up where they left off come Monday.

Fortunately, Windows NT systems will be able to hook up to other LANs. Microsoft is working with Novell and Banyan to create ways for NT to work with their LANs, and the necessary software is expected to come with the shipping version of NT. Windows NT will enable its systems to act not only as clients, but also as high-

Windows NT is unable to read partitions compressed by DOS 6.0's DoubleSpace or any other compression utility.

powered application servers, running client-server back ends like SQL Server on LANs other than its own.

If there's any reason to chuck NetWare in favor of NT's networking, it's security. Windows NT is designed to be almost entirely hackproof. During installation, every NT system asks you to choose an account name and password and a password for an administrator account. Subsequently, users without a password won't have access to your files, even if they try to reboot from a floppy-as long as you're using the NT File System. Likewise, networked NTFS drives are impenetrable to those prohibited from accessing the drive. The only gaps are that anyone with a copy could reinstall NT over your setup, destroying existing data, and extremely determined spooks could

> use a disk editor to read your hard disk bit by bit.

Windows NT's built-in networking should be fine for department-size networks, but com-LANS panywide that run critical applications will require more powerful tools, and that is where Windows NT Advanced Server comes in. This powerful but complicated system will

enable network administrators to manage multiple work groups, recover from disk errors on the fly, and add Macintoshes to the network.

The work-group management comes through the concept of domains, which shift responsibility for user names and passwords from individual workstations to centralized servers capable of communicating with each other and resolving naming conflicts. As a result, users can have faster access to systems across the network, and administrators needn't worry about maintaining unique

user accounts. Windows NT Advanced Server's disk mirroring, drive duplexing, and drive array features allow a dedicated NT server to continue serving, without loss of data, should one of its hard disks

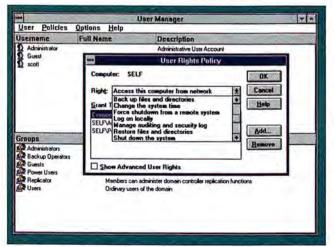
fail. The Macintosh gateway will permit up to 256 Macs to access a Windows NT Advanced Server as they would any Mac server. Microsoft says Windows NT Advanced Server will cost less than \$5000 for an unlimited number of users and that the upgrade policy for current LAN Manager sites will be competitive.

Join the NT Generation-Someday

So who is Windows NT really for? Individual users looking for the Rolex version of the current Timex Windows? Corporations hoping to avoid buying yet another expensive minicomputer? Is NT a reasonable replacement for the DOS-Windows combination? Or for OS/2? (We'll be conducting a Windows NT-OS/2 2.1 face-off in an upcoming issue.)

More important, is Windows NT for you? Do you own or plan to buy hardware that can handle it? Is your system free of software that addresses your hardware directly? And are you willing to use a relatively untried operating system? If so, the stability, robust multitasking, improved performance (which is still theoretical), multiprocessing, security, and advanced networking could prove to be substantial rewards. Otherwise, the DOS-based Windows will serve just fine for a bit longer. After all, they both come with Solitaire.

Scott Spanbauer is a contributing editor for PC World. He can be reached as SCOOTSPAN on PC World Online (see page 10 for more information).



SAFETY FIRST: Windows NT's pervasive security features let networked users pick and choose exactly who can access specific files.

HUNDREDS OF COMPANIES CAN SELLYOU A COMPUTER THROUGH THE MAIL.

BUT THERE'S ON THAT CAN DE



Announcing COMPAQ DirectPlus, a way for you to get the quality and reliability Compaq is known for, through the convenience of buying direct. We offer popular COMPAQ PCs and the industry's leading software, all at competitive prices—the kinds of products you've asked for based on your computing needs. That's the idea behind COMPAQ DirectPlus: to deliver the quality and flexibility you want, without expanding your budget.



Known for quality and reliability, Compaq offers you some of the bestengineered computer products in the industry—at very attractive prices. Everything from innovative notebook PCs to versatile desktops.

LY ONE COMPANY LIVER ALL THIS.



As an industry leader, our alliances with leading software companies let us offer you a full selection of the most popular software, everything from word processing and spreadsheet to database and presentation graphics.



THE OPENS DESCRIPTION COMMAN.

If you don't happen to see the products you're looking for in this ad, just call us toll-free at 1-800-888-5916 and ask to receive your copy of our catalog.



Our service and support options offer everything from on-site installation by a Compaq-authorized technician to on-line diagnosis of technical problems on your PC.



Many of the popular software titles we offer you can be preinstalled onto any computer that you purchase from us—at no additional charge.

We've put together a variety of special solutions for you. All of them are competitively priced and well-suited to the kinds of business functions you perform every day.



We give you lots of choices, including a leasing program and a trade-in option that lets you trade in select COMPAQ. Apple and IBM PCs. We also offer a variety of purchasing options.





Call 1-800-888-5916 and talk to an Account Representative who's trained to help you decide what products and service options are best for your particular requirements.

DirectPlus

1 800 888-5916

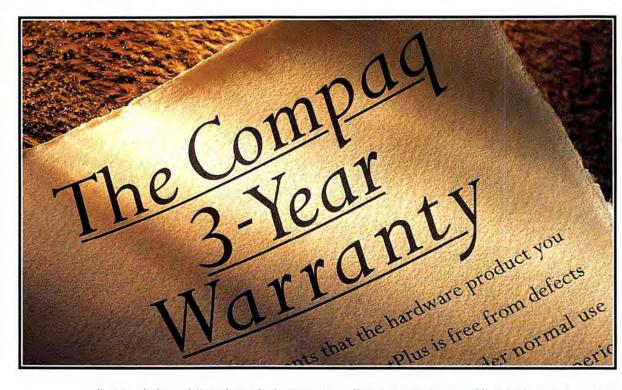
Certain restrictions and exclusions apply, see next page.

WHY BUY JU COMPUTER WHEN COMPAQ AT PRIC

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 3/25s 25-MHz 386SX, 2-MB RAM, 120-MB hard drive, VGA Color Monitor. An affordable entry-level desktop PC.



*Restrictions and exclusions apply. Monitors, battery packs and certain options are covered by a one-year warranty. *Leasing is provided by GE Capital Corporation 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.

ST ANOTHER YOU CAN GET A ES LIKE THESE?



COMPAQ ProLinea 4/25s 25-MHz 486SX, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor, Great for everyday business applications.

DESKPRO/i Features

3%" 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 6.0, Microsoft Windows 3.1 & Sound System Software, COMPAQ Mouse & Microphone.

Contura Features

3½" 1.44-MB diskette drive * Power conservation and security features * Battery * AC Adapter * Preinstalled MS-DOS 6.0, Microsoft Windows 3.1 and EZ Help On-Line Library and a COMPAQ Trackball.



COMPAQ ProLinea 4/33
33-MHz 486DX, 4-MB RAM, 120-MB
hard drive, SVGA Color Monitor, Designed for more advanced applications.



COMPAQ ProLinea 4/66 66-MHz 486DX2, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor. For high performance at an affordable price.



ProLinea Features

3%" 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 6.0

and Microsoft Windows 3.1

and a COMPAQ Mouse.

\$1899 Or \$68 per month

COMPAQ DESKPRO 4/25is 25-MHz 4865X, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor. Delivers fast, high-resolution graphics in Windows.



COMPAQ Contura 3/25 25-MHz 3865L, 4-MB RAM, 120-MB hard drive, monochrome VGA display, 6,2 lbs. An affordable notebook loaded with features.



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.



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.



1 800 888-5916

WE OFFER SPECALLED BUNDLES. THAT'S WHAT

We've put together these bundles to make it easy to get the hardware and software that you need in a complete system, at one special price. No matter what your computing needs, chances are that one of these bundles will fit the bill. Not only that, but the price you'll pay will fit well within your budget.



 Leasing is provided by GE Capital Corporation for a term of 36 months, and is subject to approved credit and certain terms and conditions. Call for details.

The Basics Plus.



COMPAQ ProLinea 4/25s 25-MHz 486SX, 4-MB RAM, 120-MB hard drive, SVGA Color Monitor.



Data+Fax Modem









AfterDark for

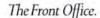


Quicken for Windows

This entry-level system gives you a full range of business and personal applications as well as data and fax communications—all at a surprisingly low price.

\$1,675 Or \$60 per month*

CIAL SOLUTIONS BECAUSE IN THE END, You'll Save.





COMPAQ ProLinea 4/33 33-MHz 486DX, 4-MB RAM, 120-MB hard drive, SIGA Color Monitor.





WordPerfect

This general business solution, which is offered to you at a very competitive price, teams up two popular word processing and spreadsheet applications.

> \$2.099 Or \$75 per month*

The Windows Office.



COMPAQ DESKPRO 4/33i 33-MHz 486DX, 4-MB RAM, 240-MB hard drive. 1024 Color Monitor.





This solution can utilize COMPAQ business audio with the most popular Microsoft applications. The Microsoft Office includes Microsoft Excel, Word, PowerPoint and Mail.

> \$2,799 Or \$100 per month"

The Office Pro.



COMPAQ ProLinea 4/50 50-MHz 486DX2, 4-MB RAM, 240-MB hard drive. SVGA Color Monitor.











Smart Suite

This solution offers data and fax communications with popular Lotus applications. Lotus SmartSuite includes Lotus 1-2-3, AmiPro, Freelance Graphics, Organizer and cc:Mail.

Or \$107 per month*





Now, Choosing What's Right For Your Business Is An Easy Call. 1800 888-5916

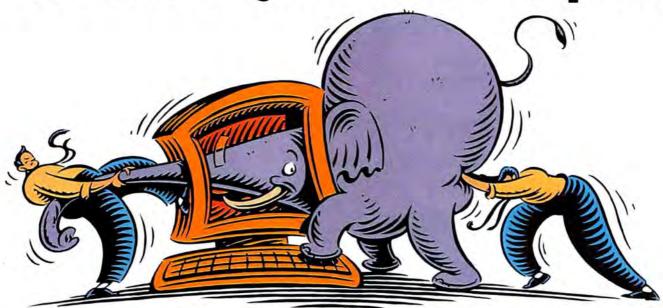
Call us toll-free to inquire about the quality products and services that we offer ______ you at very competitive prices.

Our specially trained Account Representatives can assist you in choosing a solution that is right for your particular needs. If you don't happen to see the COMPAQ products you want in this ad, just call us and ask about them. Whatever you need

ask about them. Whateveryou need, we're here to help. We look forward to your call.

© 1993 Compaq Computer Corporation. All rights reserved. Printed in the USA. Compaq, the COMPAQ logo and DESKPRO Registered U.S. Patent and Trademark Office. Conturs and Produces are trademarks of Compaq Computer Corporation. COMPAQ DirectPhis and CompaqCare are service marks of Compaq Computer Corporation. Products, process 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 Inode Ago is a trademark of Intel Corporation.

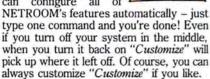
There's An Easier Way To Get More Memory Into Your Computer



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.

CRASH-PROOF

With "Customize". NETROOM's crash-proof installation utility, you can configure all of



But there's more to memory management than just easy installation. NETROOM "Cloaking" includes our revolutionary technology - a technique that allows DOS drivers and TSRs to run in extended memory as if they were running under Microsoft Windows™. Even if you never run Windows! If you do use Windows, you'll find our cloaked utilities fully Windows-compatible.

NETROOM provides a cloaked system BIOS for all compatible systems including ISA, EISA, MCA and Laptops. NETROOM's cloaked BIOS is designed to run in the "protected mode" of your 386/486 family processor. This makes it safer to use. The cloaked BIOS also takes full advantage of the 32-bit power of your computer so it runs faster. And it doesn't occupy any DOS memory, so you save up to 96K. Think of it as a free BIOS upgrade that saves memory and makes your system run faster.



In NETROOM. virus protection is integral to the cloaked BIOS. It detects when a virus or errant program tries to get at the most vital parts of your hard disk and prevents the damage before it begins. Our cloaked BIOS even stops attempts to destroy your data by reformatting your hard disk.

LIGHTNING SPEED

To really soup - up your system, NETROOM includes a cloaked Disk Cache which occupies only 5K of

DOS memory, but runs faster than any other cache. That's because our cloaking technology unleashes the 32-bit power of your system. And, NETROOM provides a cloaked text-mode screen accelerator that makes your screen run up to 20 times faster!

NETROOM is packed with other utilities as well. A cloaked graphical Screen Saver protects your screen from burn-in. A cloaked RAM disk lets you set up the world's largest RAM drive - up to 256Mb. And, cloaked DPMI support provides compatibility with the latest applications.



Colorful screen saver features exciting graphics

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. to rater (WFW is supported). Microsoft Windows is a trademark of Microsoft Corp.

Circle 90 on reader service card

We topped it all off with our enhanced DISCOVER™ system utility which now sports a snazzy and more easy-to-use graphical interface.



DISCOVER provides in-depth analysis of your PC

SOME TECHNICALITIES

NETROOM supports pooled EMS and XMS memory, all the industry standard specs: EMS 3.2 and 4.0, XMS 3.0, VCPI, EEMS, VDS. NETROOM provides DOScompatible UMBs and HMA. NETROOM loads FILES, BUFFERS, FCBs and COM-MAND.COM high, and manages self-highloading TSRs and drivers and ROM shadowing and de-shadowing.

NETWORK USERS...

With remote installation, special network support and the lowest cost and most flexible multi-user licensing available, NET-ROOM has always been the undisputed best choice for corporate and network users. And now, with the power of cloaking and the ease of our new setup utlity, NETROOM is the clear choice for you.

NETROOM...it's like getting an elephant's memory into your PC with a push of a button... for peanuts!

I-USER SPECIAL \$79 + S&H

Reg. Price: 1-user \$99, 4-users \$179+s&h

1-800-451-0551



HELIK 47-09 30th St., L.I.C., N.Y. 11101 **SOFTWARE CO.** (718) 392-3100





Microsoft is committed to providing the fastest, most reliable technical support in the industry.

EVER WONDER WHAT HAPPENED TO THAT BRAINY KID WITH ALL THE RIGHT ANSWERS? WE HIRED HER.

In fact, we've hired 1500 other smart people just like her.

Why? So you can have access to the very best technical support in the industry.

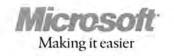
So whenever you call us with a question, you'll get the right answer, right away.

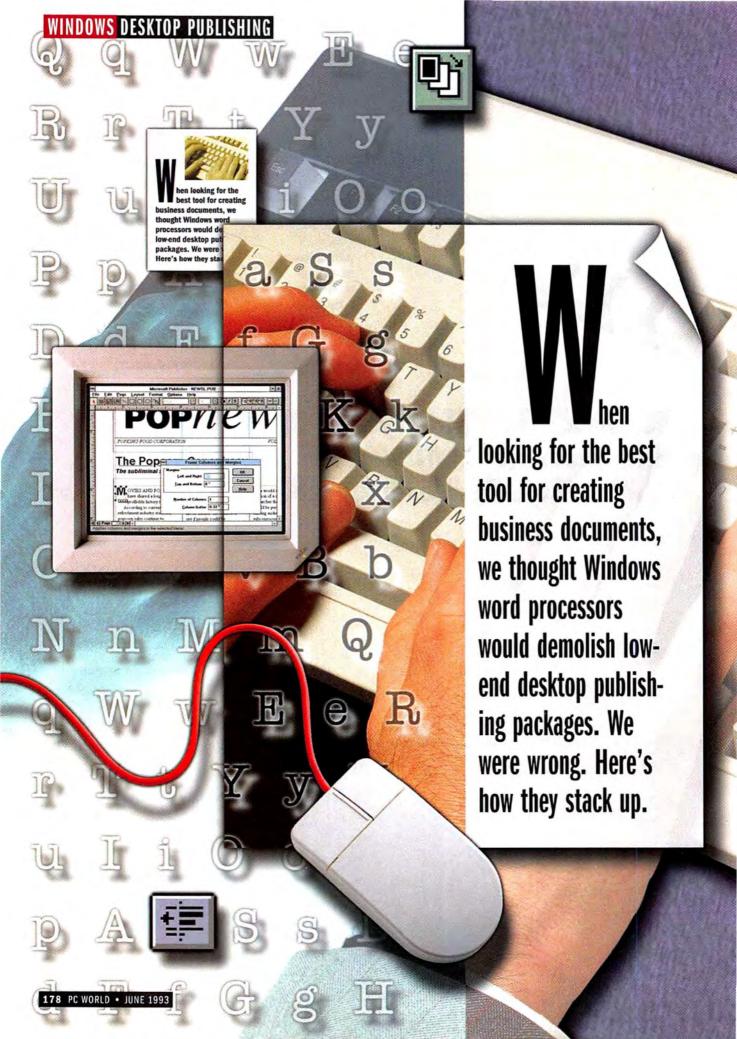
And so you can get your job done easier. Faster. Better. Whether you're discovering the magic of spreadsheet formulas for the first time. Or you're just looking for the smoothest, simplest way to zip around the Microsoft Windows operating system.

The way we see it, as people explore the limits of today's more powerful products, the job of providing support becomes critical.

So at Microsoft, we're doing the most we can to help.

It's like having 1500 good friends in the software business. Or like you're sitting conveniently close to the smartest kids in class. And you get to copy their notes.





ORD PROCESSOR

If you're a Windows user, you already have a word processor-probably Microsoft Word for Windows, Ami Pro, or WordPerfect for Windows. These brawny \$500 beasts can't be beat when it comes to writing basic documents and printing them on the office laser. But what if you want more? What if you're interested in cranking out slick-looking reports, newsletters, and other documents?

You could plunk down an additional \$700 to

DF2KI()

\$900 and get a high-end desktop publishing package such as PageMaker, Ventura Publisher, QuarkXPress, or FrameMaker. If you're in the publishing business, this is the only way to go. Most of us aren't, however; we're standard business users and our needs are simpler. Luckily we have two reasonable alternatives.

Option one is to pick up a low-cost desktop publishing package. While these DTP pro-

NRF12HFK3



grams can't match their high-powered cousins for sheer precision, long-document management, or color prepress tools, they're far easier to learn and use, and they require a fraction of the design talent. It doesn't hurt that they cost a mere \$100 to \$150 on the street, either.

But before you reach for your wallet, take a good look at option two: your Windows word processor. It might just have the page layout tools you need. Most graphical word crunchers let you create frames on each page and fill them with text and graphics, draw lines and boxes, add shading and even color-all in a WYSIWYG display for easy editing. With all that built-in design power, do you really need a desktop publishing program?

WINDOWS DESKTOP PUBLISHING

To answer that question, we pitted three best-selling low-end DTP packages against a trio of top-flight Windows word processors. In one corner, we put Microsoft Publisher 1.0, 'Timeworks' Publish It for Windows 3.0, and Power Up Software's Express Publisher for Windows 1.0. In the opposite corner sat the word processing heavyweights: Lotus's Ami Pro 3.0, Microsoft Word for Windows 2.0, and WordPerfect 5.2 for Windows.

The terms of our slugfest were simple. Pulling Ventura Publisher 4.1 from our professional tool kit, we designed three of the most common desktop documents—a brochure, a newsletter, and a business proposal—for a fictional small business called PopKing Food Corporation. Then we tried to reproduce each document in all six test applications. Because we wanted to push these programs to their limits, our designs are a tad more sophisticated than the average user might create, incorporating such elements as shaded and rotated type, layered frames, and complex text wraps.

We were looking to answer three questions: Could the program complete the layout? How easy was it to do? And is one type of program better than the other for producing a particular kind of document?

Frankly, we thought the word processors would cream the DTPers, but the page layout programs proved surprisingly feisty. Of our three WP heavies, only Ami Pro was able to handle almost everything we threw at it. WordPerfect and WinWord performed most of the tasks, but only after a lot of work-arounds and hand-holding by support technicians. The DTP programs turned out to be friendlier hands-down—especially when creating short, relatively complex documents like the brochure and newsletter. The publishers hit the ropes, though, when we forced them to prepare the longer, text-intensive business proposal.

The bottom line: None of these applications are ideal for producing every type of document. You'll still need a word processor to create most of your text files, but a lowend DTP package will definitely make some layout chores easier. The key is knowing what kind of documents you need to produce—and how fancy you want to get. What follows is a blow-by-blow account of how our contestants fared, noting the highlights and limitations of each—good things to keep in mind when it's time to create your own designs.

BROCHURE



How They Rate

WORD PROCESSORS: Barring minor snags, all the contenders held their own. WinWord had trouble with our EPS graphics; WordPerfect couldn't rotate TrueType fonts; Ami Pro shone.

Ami Pro ★★★½
Microsoft Word for Windows ★★★
WordPerfect for Windows ★★½

DTP programs: Express Publisher couldn't perform irregular text wraps (though the next version should), and Microsoft Publisher balked at importing our EPS images, but mostly the lowend DTP programs proved to be ideal for this type of layout.

Publish It ***

Express Publisher ***

Microsoft Publisher ***

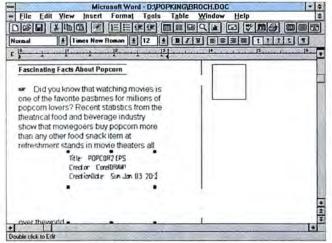
The Joy of Popcorn is a typical example of a marketing brochure. It's printed in land-scape orientation on both sides of an 8½-by-11-inch page, then folded into thirds, so the

front panel becomes the cover and the back panel contains space for an address label. The other four panels contain text and high-quality EPS graphics-popcorn kernels, bags of popcorn, and the PopKing logo-created in CorelDraw. The brochure also employs two design elements that proved especially challenging to several programs: We used an irregular text wrap to flow the text along the edge of each graphic; we also placed the return address and logo inside a box on the back panel, then rotated them 90 degrees. We used True-Type Arial and Times New Roman fonts wherever possible. When a feature, such as Publish It's PowerText, worked only with Type I fonts, we substituted Helvetica and Times and used Adobe Type Manager.

Low-cost page layout packages excel at brochures and other short, design-intensive documents, thanks to features like column guides, extensive drawing tools, and the capability to layer frames. While Ami Pro did a good job overall, the other two word processors came up short. Of the six contestants, only Publish It was able to easily flow text around irregularly shaped graphics. The other programs provided only blocky, squared-off text wraps. And three programs-Word for Windows, WordPerfect for Windows, and Microsoft Publisher-choked on some of our popcorn graphics. None of these three can accept CorelDraw EPS files that contain an image header (a bitmapped version of the graphic that lets you see the image on screen). We had to export the files to an EPS format without image headers, which made placing and sizing the graphics on screen much tougher.

Ami Pro

Of the three word processors, Ami Pro gives you the most publishing power. It even provides column guides, which make it easy for you to draw frames with the mouse and line them up on the page, plus a column balance feature that aligns text frames at the top and bottom of the page automatically. The only thing that had us



WORD FOR WINDOWS, Microsoft Publisher, and WordPerfect for Windows all had problems digesting some of our EPS graphics.

stumped momentarily was figuring out how to rotate text—you need to use Ami Pro's drawing tool.

Microsoft Word for Windows

While WinWord lets you draw frames, it has no column guides. You're stuck lining up the frames using the ruler or specifying page coordinates inside a dialog box—which entails a lot of trial and error. Aside from Word for Windows' troubles with our EPS graphics, the layout went fairly smoothly. The only way to rotate the return address, however, was by using WordArt, a special effects utility that ships with Win-Word. Since WordArt uses bit-mapped fonts instead of Windows' True Type outlines, print quality was poor.

WordPerfect for Windows

Overall, WordPerfect did a respectable job with the brochure, but didn't make the job easy. Instead of frames, WordPerfect uses several different types of "boxes"-text boxes, graphics boxes, and so on-a holdover from its DOS forebear. There's no way to draw a box with your mouse; you have to type in the box's size and coordinates and, if you make a mistake, resize and place it with your mouse. But WordPerfect really fell on its face when it came to creating the return address on the brochure's back panel. When we tried to rotate the return address using True Type fonts, the text refused to turn and printed outside of the box where we'd placed it. Adobe Type I fonts, on the other hand, rotated just fine.

Express Publisher

In this case, no news is good news. Express Publisher imported the EPS graphics cleanly and rotated the return address perfectly. Our trial turned up just one flaw: Express lacks an irregular text wrap feature. We should always have such problems.

Publish It for Windows

Publish It sailed through the brochure with ease—it's the only product here that lets you contour text easily around irregularly shaped graphics. The only snag showed itself when we tried to rotate the return address—you need the program's Power-Text add-on, which requires Adobe Type Manager. If you use only TrueType, you can't rotate type in Publish It.

Microsoft Publisher

Publisher did a fine job with most of the brochure. But because it uses the same file import filters as WinWord, it can't accept EPS files containing image headers, which meant the only sure way to check graphics placement was by printing drafts. And, like WinWord, Publisher relies on WordArt for rotating text—not a workable alternative.

NEWSLETTER



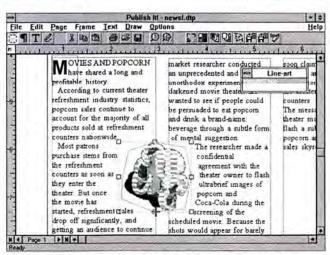
How They Rate

WORD PROCESSORS: Except for Ami Pro, the intricate layout features of our newsletter proved too taxing for the word processors. We weren't able to complete it in either Word for Windows or WordPerfect for Windows.

Ami Pro ★★⅓ Microsoft Word for Windows ★★ WordPerfect for Windows ★⅓

DTP programs: While the DTP programs didn't include every feature we needed, their overall page layout orientation made creating the newsletter easier.

Microsoft Publisher ★★½
Express Publisher ★★★
Publish It ★★★



TIMEWORKS' PUBLISH IT WRAPS TEXT AROUND GRAPHICS of any shape and lets you adjust the bounding box that surrounds the image.

Creating a newsletter is invariably harder than it looks, and this example was no exception. Of our three sample documents, the four-page POPnews features the most difficult collection of design elements. The front page contains a band of reversed type across the top and a banner with 127-point type. The letters "POP" in the banner are screened at 30 percent black, which makes them appear gray, and the space between the letters in "news" has been increased to spread them across the page. The first paragraph of each story begins with a 24-point letter inset into the text (a "drop cap"). Two EPS popcorn graphics and the PopKing logo are placed in the text with an irregular text wrap around them.

Other tricky design elements include a display quote near the bottom of the first column on page 1, a jumpline ("Continued on page 2") at the end of the third column, and a two-column sidebar in a shaded box in the bottom-right corner.

To complicate things further, the page features a hairline border. With most of the programs this required us to draw one large frame and lay several smaller text and graphics frames on top of it—a task that brought some applications to their knees. Another key newsletter feature we tested for is frame linking, or the ability to flow text between nonconsecutive pages, from, say, page 1 to page 4.

If you're creating a long or fairly sophisticated newsletter, save yourself some aggravation and buy a low-cost page layout program. All the desktop publishers here have one essential feature needed for newsletters—frame linking. Not one of the word

> processors does. which means the only way to jump text from one frame to another is by cutting and pasting-a major hassle if you need to select all the text in a specific story or make revisions. Except for its frame linking deficiency, Ami proved the most capable for laying out the newsletter, with Microsoft Publisher a close second.

Finely-Tuned Orchestrated Solutions...

It takes more than just great computers to meet the information management needs of today's businesses. It takes talented people who have the ability to orchestrate solutions using the finest products and services available. And that's precisely what you get when you choose Northgate.

Here are just a few examples of the hardware platforms that await you. Keep in mind that we'll configure your systems any way you like. And back them with service and support that was just named "Readers' Choice" by PC Magazine. Take a look, then call Northgate today.



Northgate ZXPortable

- 80486SX/25MHz or DX/25MHz processor
- 120MB hard drive (200MB available)
- 4MB RAM (expands to 16MB)
- VGA monochrome with 64 shades of gray or Active Matrix Color display with 256 simultaneous colors
- 86-key full-travel keyboard
- Nickel metal-hydride battery for up to 4 hours of power (3 hours color)
- 8.5" x 11" size
- · Monochrome weighs 6.2 lbs.; color 6.4 lbs.
- MS-DOS 6.0 and Windows¹⁸ 3.1
- Logitech[™] TrackMan Portable mouse
- Fabric carrying case
- Free \$395 value PackRat PIM/contact management software

ZXPortable 486SX/25 Monochrome \$1899 Color \$3599

ZXPortable 486DX/25 Monochrome \$2099 Color \$3799

Optional Docking Station \$599

Docking Station Bundle with 14" SVGA color monitor, *OmniKey* keyboard, 1.2MB floppy drive and desktop mouse \$999



Northgate 486-VL

- 80486SX/25 processor
- Upgradable to OverDrive" processors
- Two bus-master VESA local bus slots
- . Local bus video with 1MB RAM
- 128K cache
- · 4MB RAM (expands to 64MB)
- 100MB hard drive
- Space-saving case (tower available)
- . 1.2MB or 1.44MB floppy drive
- Northgate 15" non-interlaced SVGA color monitor
- 101-S keyboard

\$1749 (Lease as low as \$62.86/mo.)*

As configured above with 80486DX/33 processor \$1999 (Lease as low as \$73.96/mo.)*

As configured above with 80486DX2/66 processor \$2449 (Lease as low as \$90.61/mo.)*



SlimLine[®] 486 ZXP-L

- 80486SX/25 processor
- Upgradable to i486¹⁶ processors and OverDrives
- 1MB local bus video
- Virtual cache
- 4MB RAM (expands to 128MB)
- · I00MB hard drive
- · Space-saving SlimLine case
- . 1.2MB or 1.44MB floppy drive
- Northgate 14" non-interlaced SVGA color monitor
- 101-S keyboard

\$1499 (Lease as low as \$55.46/mo.)*

Configured as shown with 80486DX/33 processor \$1749 (Lease as low as \$62.79/mo.)*

Configured as shown with 80486DX2/66 processor \$2199 (Lease as low as \$81.36/mo.)*



Elegance 486 ZXP EISA VESA

- 80486DX/33 processor
- Upgradable to other i486 processors and OverDrives
- Eight 32-bit expansion slots
- 128K cache (256K available)
- 8MB RAM (expands to 256MB)
- 240MB IDE hard drive
- Space-saving case
- . 1.2MB or 1.44MB floppy drive
- Accelerated "Windows video with IMB RAM
- Northgate 15" non-interlaced SVGA color monitor
- 101-S keyboard

\$2999 (Lease as low as \$102.57/mo.)*

As configured above with 80486DX/50 processor \$3349 (Lease as low as \$114.54/mo.)*

As configured above with 80486DX2/66 processor \$3449 (Lease as low as \$117.96/mo.)*

Elegance 486 ZXP

- 80486SX/25 processor
- Upgradable to i486 processors and OverDrives
- 64K cache
- 4MB RAM (expands to 32MB)
- . 100MB hard drive
- Space-saving case (tower available)
- 1.2MB or 1.44MB floppy drive
- Northgate 14" non-interlaced SVGA color monitor
- 101-S keyboard

\$1599 (Lease as low as \$59.16/mo.)*

As configured above with 80486DX/33 processor \$1849 (Lease as low as \$66.38/mo.)*

As configured above with 80486DX2/66 processor and Tower case \$2299 (Lease as low as \$85.06/mo.)*

At Prices That Will Make You Applaud.



Northgate OmniLAN Systems

Northgate offers a variety of "plug and play" network solutions for up to hundreds of users. Here is just one example.

Novell[®] Server

- Elegance™ ZXP 486DX/50 EISA
- · 16MB RAM
- Adaptec 1740 SCSI controller
- 525MB hard drive
- 1.44MB floppy drive
- Intel Ethernet Express 32-bit Thinnet interface card
- VGA video adapter
- 14" VGA monochrome monitor
- 101-S keyboard
- FREE installation of Novell NetWare with NetWare purchase

\$4649 (Lease as low as \$154.35/mo.)*

Power Workstation

- SlimLine ZXP 486SX/25
- 4MB RAM
- 240MB hard drive
- . 1.44MB and 1.2MB floppy drives
- Local bus VGA with 1MB RAM
- Intel Ethernet Express 16-bit
- 14" SVGA color monitor
- Thinnet card 101-S keyboard

\$1749 (Lease as low as \$62.79/mo.)*

Advanced Application Workstation

- Elegance ZXP 486DX2/66
- · 8MB RAM
- 240MB IDE hard drive
- 1.44MB and 1.2MB floppy drives Accelerated Windows video with IMB RAM
- Intel Ethernet Express 16-bit Thinnet card
- 14" SVGA color monitor
- 101-S keyboard

\$2999 (Lease as low as \$102.57/mo.)*

Northgate Server Array

- 486DX2/66 EISA motherboard with 16MB RAM (expands to 128MB)
- Single SCSI channel; expandable to 3 and 5 channels
- EISA bus master with 33MB burst mode transfers
- 4MB cache controller; expands to 64MB
- 560MB base storage; expands to 10GB
- RAID levels 0, 1 and 5
- Hot-sparing and background data rebuild for zero downtime
- Three independent power supplies with redundancy
- 14" SVGA monochrome monitor
- Northgate 101-S keyboard
- Novell certified device drivers and utilities for NetWare" 3.11
- Vertical case
- · Five year limited warranty

\$8699 (Lease as low as \$280.98/mo.)*

Northgate External Disk Array

- 560MB base storage; 60GB maximum with 5 channel array
- Single SCSI channel; expandable to 3 and 5 channels
- EISA bus master with 33MB burst mode transfers
- 4MB cache controller; expands to 64MB
- RAID levels 0, 1 and 5
- i960-based RAID controller and cabling to connect the array to the server
- Hot-sparing and background data rebuild for zero downtime
- Three independent power supplies
- Novell certified device drivers and utilities for NetWare ** 3.11
- Vertical case
- Five year limited warranty

\$4599 (Lease as low as \$152.69/mo.)*



Award-Winning

Northgate OmniKey™ Keyboards

- Choose 101N1 with 12 F-keys on top; 102 with 12 F-keys on left or ULTRA with 12 F-keys on top and left
- · Alps" click/tactile key switches
- Independent inverted "T" cursor control and numeric keypads
- · Limited dexterity features
- Rate select from 3-120 CPS
- Interchangeable CRTL, ALT, CAPS LOCK keys
- · OmniKey utility disk
- · Unmatched IBM* compatibility
- FCC Class B certified



OmniKey/101NI or 102 ONLY \$89 OmniKey/ULTRA-T ONLY \$129

Call For More Information 800-453-0128

GSA #GS00K91AGS5193 PS01

Major credit cards, money orders, direct wire and approved company purchase orders accepted.





Solutions for Workgroups™ 7075 Flying Cloud Drive, Eden Prairie, MN 55344

© Copyright Northgate Computer Systems. Inc. 1993. All rights reserved. Northgate and ZNFortable are U.S. trademarks or registered U.S. trademarks of Northgate Computer Systems. it is foliars and the Intel Inside logo are U.S. trademarks of Intel. All other products and brand manies are U.S. trademarks and registered U.S. trademarks of their respective companies. Prices shown are in U.S. dollars and do not include shipping/handling charges or appropriate sales taxes. Offer salid in the U.S. and Canada only. Prices and specifications subject to change without notice. Northgate reserves the right to substitute components of equal or greater quality or performance. All items subject to availability.

WINDOWS DESKTOP PUBLISHING

Ami Pro

Ami is the only word processor with a pageborder tool, making our chores much easier. Its Send to Back and Bring to Front commands allowed us to layer frames and then shuffle their order, which proved invaluable when creating the sidebar and placing the logo inside it. If only Ami could do irregular text wraps and link frames, we would have been thrilled.

Word for Windows

This newsletter proved a tad too complex for WinWord. The only way we were able to create the page border, for example, was to use an obscure macro and output to a Post-Script printer. To create the gray text in the POPnews banner, we had to specify it as a color, which Windows' printer drivers convert to a gray shade on black-and-white printers. In order to draw two columns in the sidebar frame, we had to call Microsoft technical support, who told us to create the columns first and then frame them. Even then, there was no easy way to wrap the sidebar text around the edge of the Pop-King logo. At that point we gave up.

WordPerfect for Windows

To lay out a document this sophisticated in WordPerfect for Windows you'll need an intimate knowledge of WordPerfect's formatting codes and a large bottle of aspirin. For instance: The only foolproof way to create a page border is to define a page-size user box in a header-who would ever think of that? WordPerfect also falls short in its handling of text and graphics boxes. When we tried to layer a small box on top of a larger one, we couldn't use the mouse to select or

move the small box. Instead, we had to leave the editing window and plod through cumbersome dialog boxes. The process got worse from there.

Express Publisher

Express Publisher gave us only minor hassles. The program allows only one column per frame, and each frame must have the same size rules on all four sides. Since the POPnews sidebar has multiple columns, a 6point rule at the top, and a hairline rule on the left, we had to draw five frames. Graphics created with Express Publisher's drawing tools require their own frame; if you draw a line under some text and then move the text, the line won't come along with it. Finally, the Undo command is limited to moving (or unmoving) objects. With a trialand-error venture like page layout, you really need more.

Publish It for Windows

Publish It for Windows, on the other hand, has no Undo command at all. Still, laying out the newsletter was simple, with a few small exceptions. To tint the text in the banner requires PowerText, which uses only ATM fonts. And there is no way to select text across linked frames-Timeworks sorely needs to add a Select Entire Story command to Publish It.

Microsoft Publisher

Next to Ami Pro, Microsoft Publisher did the best job on our newsletter. We had the same problem with the EPS graphics as in the brochure, and we had to use WordArt to tint the headline text, but otherwise our document came together faster than it did with any other program.

More on the Way

Technology never stands still. While we were preparing this article, Microsoft Corporation was working on upgrades to both Word for Windows and Publisher and WordPerfect Corporation was laying the groundwork for WordPerfect for Windows 6.0. According to Microsoft, Publisher will sport several new features addressing some of the more egregious problems we encountered. Apparently the next version will include style sheets, better all-around long-document handling, a table editor, improved irregular text wrap, and TrueType support for its WordArt miniapplication.

On the word processing front, WordPerfect should be releasing WordPerfect for Windows 6.0 sometime in late 1993. And rumors of a release later this year of Microsoft's Word for Windows have also been circulating. Neither company is discussing potential features just yet, but we feel safe in predicting that WordPerfect will sport better frame handling and TrueType support. And since Word for Windows uses the same WordArt module as Publisher, the next version of Word will have better text rotation capabilities.

BUSINESS PROPOSAL



How They Rate

Word processors: overall, the word processors were much more adept at handling long documents than the low-end publishing programs.

WordPerfect for Windows ★ ★ ★ ★

Ami Pro * * * 1/2

Microsoft Word for Windows ★ ★ ★

DIP programs: As a rule, the low-end DTP programs lacked long-document prowess.

Express Publisher * * 1/2 Publish It * * 1/2 Microsoft Publisher * *

The PopKing marketing proposal shown here tested each program's long-document handling capabilities, such as page numbering, headers and footers, and style sheets. It consists of a cover sheet and 11 two-column pages: a two-inch column on the left for headings and captions, and a four-inch column on the right for body text. Embedded throughout the body text are spreadsheet charts and graphs. In this type of document, figures and graphics can change often, and you'll need to be able to update them easily as the data changes. This put our programs' Object Linking and Embedding (OLE) capabilities to the test.

Compared to the newsletter, the proposal's design is simple: It doesn't contain any layered frames, EPS files, or text wraps, and it relies heavily on paragraph styles and the software's ability to anchor graphic frames to text. The short-and-sweet conclusion here is that it's easiest to produce this sort of document using a word processor—particularly WordPerfect. The paragraph style controls in our three word processors are far more sophisticated than those found in low-end page layout programs, and all three let you create tables and set up OLE links. On the DTP side, only *Microsoft Publisher* supports tables and OLE, but its lack of style sheets makes it unsuitable for long documents. And none of the DTP packages can anchor frames to paragraphs: Every time we made a change or brought in a graphic, it made drastic changes to our layout.

Ami Pro

While Ami Pro had no real problems with the proposal, it didn't make the layout exceptionally easy either. As with the DTP programs, we poured body text into a column on the right, headings and captions into the frames on the left. Ami Pro let us anchor frames to paragraphs, which meant importing graphics and doing revisions didn't wreak havoc on our frame placement.

Microsoft Word for Windows

It took us several phone calls to Microsoft's tech support to figure out how to create this document in WinWord. At first, the frames seemed to move around by themselves, and text jumped out of frames when we applied paragraph styles to it. Microsoft told us to create a column for the body text on the right side of the page, to create frames for

Define Columns

File Edit View Layou

Define Columns

Humber of Columns

Humber of Columns

Left Right

1: 1" 2.5"

Type 2 2.75" 7.5"

Hempaper

Potable

Potable

Options

Executive
SUMMARY

Options

Everly Spaced

Distance Between Columns

Columns

OK Cancel

III 1997, SALES of pounet popers food yordests naturally graw over wight persont. This execut of growth is significant in the highly complex and ever charging unifies dellar food industry.

1. BACKGROUND

POPCOIN FOOD PRODUCTS represent a properately growing segment of the pears food under industry person food trade over the past for pears has seen on explosion in promot popers food interact. Taken from

Foot: CENTURY SCHOOLBOOK (T1) 34 PT Col 1. Pg 1 Let 1.35" POS 1"

WORDPERFECT'S PARALLEL COLUMNS FEATURE made laying out the proposal a snap. Other programs required us to create separate frames for the headings and captions.

headings and captions in the left margin, and to define the frames as part of the paragraph's style. That worked, but we would never have figured it out on our own.

WordPerfect for

Word Do

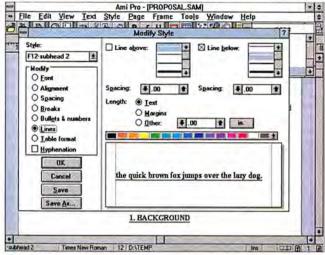
WordPerfect did the best job here. Using its parallel columns option, we were able to create headings and captions in one text column, body text in anoth-

er—we didn't use frames at all. Parallel columns act like tables: No matter how we edited the body text, the headings moved appropriately. To format the document, all we did was apply styles on each page, type captions, and embed our charts and graphs.

Express Publisher

Express Publisher doesn't support OLE, but it does have a proprietary option for updat-

> ing graphics and text files that works reasonably well. However, Express's master page tool, which lets you specify design elements such as rules and headers that usually appear on every page of a document, will not let you hide certain elements for specific pages in the proposal. Because the report's cover sheet doesn't have a header or a page number, we had to



AMI PRO LET US DEFINE THE LINES below the section headings as part of their paragraph styles, a feature none of the DTP programs support.

treat the cover as a separate document with its own master page—an awkward fix.

Publish It for Windows

Publish It also lacks support for OLE—but unlike Express Publisher; it provides no proprietary alternatives. Otherwise it does a reasonable job of laying out the report. We did uncover a small hitch, though: Publish It doesn't support small caps, which are capital letters set at the x-height of standard lowercase letters. Small caps appear in several places in the proposal.

Microsoft Publisher

Microsoft Publisher has some of the tools necessary for creating long documents, such as OLE and table support, but lacks one crucial feature: style sheets. Style sheets let you format big chunks of text at once—a necessity for long documents. Publisher forced us to format every paragraph manually, which made the process three or four times longer than it should have been.

William Harrel is a writer and desktop publisher based in Weaverville, California. He has written four books on desktop publishing, including one on Aldus PageMaket and two on Ventura Publisher.

1131	ш	-			11	,
w	п	Εĸ	Ю	D	u	ij

	ı
Ami Pro 3.0	
List price: \$495	
Lotus Develop-	
ment Corp.	
800/343-5414,	
617/693-3899 (fax)	
Reader service no. 716	

Microsoft Word	
for Windows 2.0	
List price: \$495	
Microsoft Corp.	
800/426-9400,	
206/635-6100 (fa:	
Reader service no. 71	7

WordPerfect 5.2 for Windows List price: \$495 WordPerfect Corp. 800/451-5151, 801/222-5077 (fax) Reader service no. 718

Express Publisher
for Windows 1.0
List price: \$149.95
Power Up Software
415/345-0551,
415/345-5575 (fax)
Reader service no. 719

Microsoft
Publisher 1.0
List price: \$199
Microsoft Corp.
800/426-9400,
206/635-6100 (fax)
Reader service no. 721



Let's face it. In today's competitive business environment, the strongest organizations are the ones that effectively share information. At Acer, we call this strength in numbers.

Acer provides powerful solutions, tying together desktop systems with powerful information servers through a range of products spanning from low-cost servers to complete UNIX®-based

client/server systems.

Founded in 1976, Acer—a multinational company with 1992 sales of \$1.2 billion—manufactures a broad range of products designed to meet corporate America's computing needs. For the corporate UNIX environment, Acer delivers the strongest price/performance in the industry, offering the power of midrange systems at microcomputer pricing.

Acer continually pushes the envelope of functionality and price/performance, enabling you to derive the greatest strength from your available numbers.









AcerFrame 500

The AcerFrame¹⁴ 500 provides a low-cost hardware platform fully compatible with off-the-shelf operating systems and network environments from partners like Novell*, Microsoft*, Banyan*, IBM* and SCO*. The AcerFrame 500 is an entry level EISA server at the price point of an ISA server.

ChipUp^w technology allows processor upgrades to 486DX2/66 today and will be compatible with future generations of Intel[®] microprocessors. And on-board memory, expandable to 64MB using non-proprietary SIMMs, adds to the AcerFrame 500's flexibility. But we've added more than flexibility—we've

Specification Summary

Intel 486DX/33 ChipUp to 486DX2/66

4MB to 64MB RAM

5 EISA and 2 ISA expansion slots, 1 local bus slot

Six 5 1/4" and one 3 1/2" storage bays

Optional graphics accelerator delivers 28+ WinMarks

also added security.
Eleven levels of software,
hardware and mechanical
security features add
extra protection to your
network.



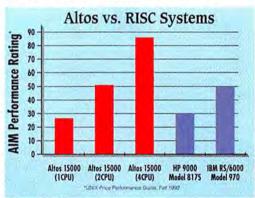
Altos System 15000

The Altos® System 15000 is a fully integrated solution that outperforms all leading RISC-based systems at the price point of a PC server. The Altos solution meets the performance and reliability demands of the most business-critical environments.

This symmetric multiprocessing system provides one to four Intel 486DX CPUs at 50MHz. Multi-threaded I/O and networking allow maximum multiprocessing scalability. And the Altos System 15000 is 100% SCO compatible, giving you the widest selection of available applications. All Altos products are backed by the Acer worldwide service and support organization.

The benefits of an open systems environment are greatly

enhanced by quality software. Highly optimized I/O controllers in the Altos System 15000 are complemented by key extensions to SCO UNIX and MPX, together with desktop integration through Altos NetWare[™] for SCO UNIX Systems.



Some of the Altos software solutions include:

- Altos NetWare for SCO UNIX Systems—perfect for integrating SCO UNIX or Altos systems with a Novell PC LAN
- Value-added enhancements to SCO UNIX for our single and multiprocessor servers
- Breakthrough desktop integration for PCs through Altos NetWare for SCO UNIX Systems and Altos APEX** for Windows—a powerful Windows-to-UNIX integration solution
- Advanced system software for client/server computing environments





ONLY THE STRONG SURVIVE

Call 1 - 800 - SEE ACER for a distributor or reseller near you

DATABASES STATES OF THE COME TO WINDOWS

The claim of new Windows database programs: to make managing information a point-and-click

affair. Do they succeed? We test seven packages—for novices and pros—to find out.

t last—after years of drought in *Windows* database land, the software showers have started, and now a number of *Windows* database managers are on the market. This is great news for all *Windows* users and might finally tempt hard-core DOS fans to make the big switch. We jumped right in to evaluate these new programs and see if the wait was really worthwhile.

While these programs address a variety of database tasks, they all claim one common feature: ease of use. FileMaker Pro and AceFile provide simple database management. DataEase Express and Approach try to blend application development and high-level capabilities while avoiding programming. And the most sophisticated of these programs, Superbase, Access, and Paradox for

Windows, besides claiming simplicity for the end user, are fully featured and make programming easier than ever. To help you separate this spectrum of complexity, we've ordered the reviews in this roundup from simplest product to most complex.

We chose to look at software that had been released recently.

BY CELESTE ROBINSON

the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

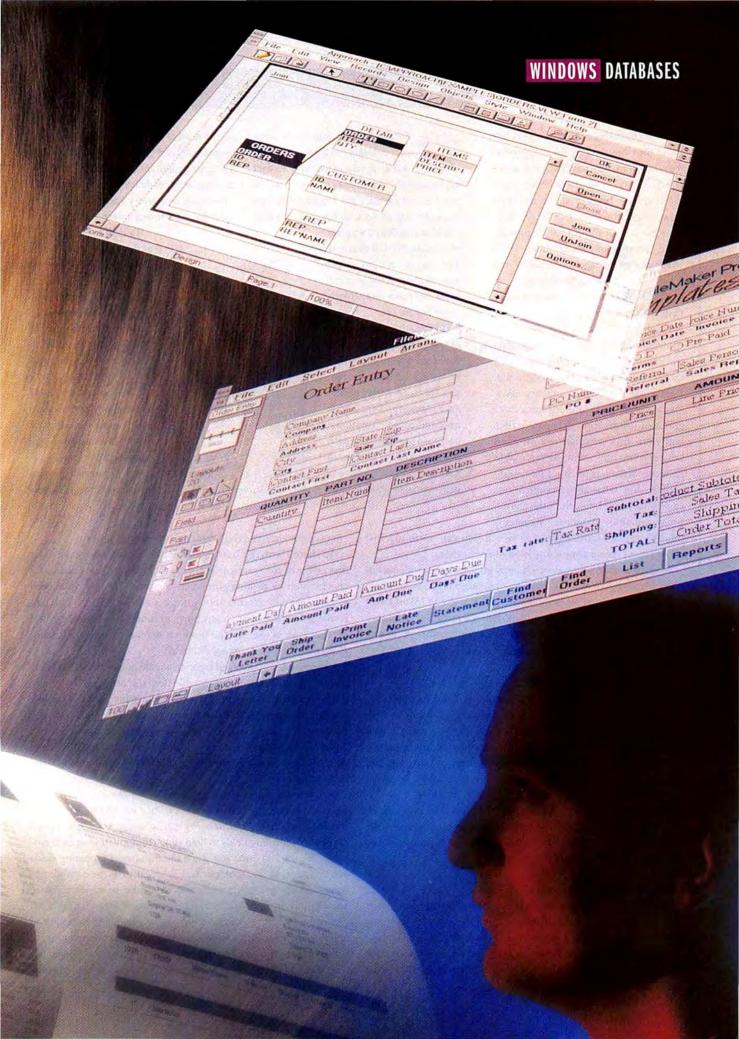
base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Paradox for D1 CLLS1L NODINGSON

Control of the wait was really worthwhile.

base, Access, and Acc



We didn't include WindowBase because its new version was not yet available and we felt it wouldn't be fair to compare it to the newer products here. We also didn't include three other products because they're primarily for developers: Two of them, Microsoft's FoxPro for Windows and Computer Associates' dBFast, have been available for some time, while Borland's dBASE for Windows has not yet shipped. We'll provide more information about these other Windows data managers in future issues.

Let's lay some groundwork: The products we tested represent a wide range of database capabilities. Nonrelational database managers allow easy management of simply structured data (for example, what you could put in a table) that's contained in a single file. Relational database managers allow you to create and store different categories of information in separate files and then link or relate information between the files. Nonprogrammable database managers let you build applications, but what these applications can do is limited. On the other hand, programmable database managers

(and to a lesser extent those in which you can write macros) allow you to create almost any kind of application.

To discover just how good each program is for its intended audience, we tested them using a battery of detailed tasks, from simple to complex, focusing on usability. We also had the PC World Test Center run some straightforward performance tests. But before we get into the results, let's take a look at what distinguishes these new data managers from their DOS-based ancestors.

Is a GUI Worth a Thousand Characters?

Some say appearance and style are everything. These new *Windows* database managers have both and manage to back them up with some real substance. Most notably, they help you easily create good-looking forms and reports. With a couple mouse clicks, you can change the style, font, size, and color of text and data and add graphic elements to your forms and reports. Most of the programs will also let you store sound or video objects in data files.

But the real question is whether the data handling is any good. Does the graphical interface of these new *Windows* products really make it easier to manage data than popular DOS programs like *Q&A* and *Paradox* do? And if so, how?

Chasing the Windows Database Grail

To find out which of these products deserved a Best Buy, we based our tests on a hypothetical work group trying to get its job done using information from a variety of sources. Customer and contact information might come from a local PC, while sales information could be stored as *dBASE* or SQL files on a server. We devised a

Best Buys

For s

For simple, nonrelational databases, FileMaker Pro earns a Best Buy due to its ease of use and excellent

performance. It doesn't support multiple file formats, and you can't use it to graph or cross-tabulate data as with AceFile, but for point-

and-click simplicity it's a clear winner. AceFile did nearly as well overall, and you might want to check it out because of its low price and slightly larger feature set.

With the simplicity of its user interface, its capability to access data in several different file formats directly, and its good performance, Approach gets a Best Buy for uncomplicated relational database projects. Approach makes it easy to customize data entry. You don't have to write any code or use macros



BEST BUY APPROACH is the simplest and most straightforward relational database.

as with most of the more powerful programs. You can point and click to join data files visually to create multitable forms and reports, and there are plenty of built-in macros. Paradox for Windows is also pretty good for straightforward, simple relational operations.

It's hard to pick a winner at the high end of this group. The programs are so complex and vary so much in capability that the choice depends on the situation.

We consider Paradox for Windows and Access to be the most useful when your project is complex—say, a database system for a large department—and you have only a couple weeks to get it up and running. For really complex database applications involving several linked departments, Access

group of five database challenges of increasing complexity.

We started with the basic building blocks of any database. The first task was to create a table of customer information, add data checks such as making sure each customer ID was numbered sequentially, and test data entry using a plain-vanilla form. This task is straightforward, one that any program should handle. We focused here on ease of use. All the products earned passing grades, but FileMaker Pro and Approach did best.

The second task involved creating a table of contact/action information related to the customer table from the first task, then using it to make a follow-up report of incomplete action items. This task is more complex, but it's the basic work of a relational database manager. If a program didn't pass, you should consider it only for individual use—keeping track of simple lists and tables of information, such as contacts or an office inventory—and not for anything more complicated.

With the two nonrelational programs, FileMaker Pro and AceFile, we could create the follow-up report, but we had to settle for a makeshift solution. FileMaker Pro can be set up to include a fixed number of repeating fields to hold contact information in each customer record. But once you reach the number of repeating fields you've specified, you're stuck. AceFile actually has the capability to relate and join two tables to create a new table, so we were able to get all our customer and contact information into one table for reporting. However, you can suppress only one of the duplicated fields, so the final output included lots of repeated information.

For a more stringent test of the relational programs' power, our next task was to use five tables together for order entry and invoic-



ACCESS wins the Best Buy at the high end.

is best when you are short on time. But consider both Paradox/Win and Access when you have plenty of time, since the features of either in certain areas could outweigh other advantages. We feel obliged to make an overall call here, though,

and Access just edges out the others for Best Buy, principally because of ease-of-use features like macros. But it's a close finish, and the choice of a high-end database is too important to make lightly. Consider the pros and cons of each program in relation to your needs.

To sum up the merits of the various contenders, Access and DataEase Express for Windows have the most ease-of-use features for difficult tasks, Paradox for Windows is easiest for creating data files and customizing data entry and easier to use on the basic building-block operations of database management, and Superbase is the most straightforward in approach and is now in its second Windows release. On the downside, Access reportedly has bugs (though we didn't see any) when dealing

with very large data sets and has a steep learning curve, DataEase Express is lacking in high-end functionality and programmability, Paradox/Win has problems with some form and report functions, and Superbase is not as easy to use as the others.



FILEMAKER PRO is our Best Buy for flat-file data management.

standard activity, and it should be easy to set it up to execute with a mouse click. This task was enlightening, as we found that FileMaker Pro and Approach, two of the nonprogrammable products, let you set up these buttons with a few mouse clicks, while Superbase and Paradox for Windows required that you write code to attach to the buttons, or at the very least open a programming editor to drop in a canned routine.

The Right Database for You

In this type of roundup we ordinarily try to determine which products deserve a Best Buy based on ease of use, performance, price, and other factors. With these products, however, no one database can be recommended for all users. The best choice depends on the kind of information that you're working with and how sophisticated your data management needs are. The first step

should be to figure out just how much database power you need. Here's a breakdown of the possible categories as we see them:

If you need a database just to keep track of phone numbers or some other project where you can keep all your information in one file, an easy-to-use flat-file (nonrelational) program like FileMaker Pro or AceFile will work for you. If you're not sure a flat-file data manager is enough, look carefully at the unique features of File-Maker Pro and AceFile that stretch them beyond the typical nonrelational data manager. Also, FileMaker Pro has the advantage of working across both the Windows and Macintosh environments, while AceFile uses the common dBASE file format. Or you might consider a more powerful program, like Approach or DataEase

ing. We related tables of customer, sales rep, order, line item, and product information, putting together a multitable form for order entry, then creating a report that could be used to print invoices. If a program can't manage this tougher relational task, then it won't do for building applications designed to integrate and run your business. Neither *FileMaker Pro* nor *AceFile*, with their strictly limited relational capabilities, could complete this task or the next.

Our fourth task was to create a summary report of total sales by salesperson. We had to be able to summarize information across related tables. We could do this with all the relational products, but

with varying difficulty. If your business requires different departments to work together, and they all need to provide high-quality reports on their day-today operations, the database you choose should be able to handle this fairly tough reporting task.

Each product's approach was unique. Access's Report Wizard feature showed to nice advantage

here. The report it created needed to be doctored a bit but required less work than the *Paradox for Windows* report, where the only way to add summary fields was to do it manually. The final result from *DataEase Express for Windows* 'Query By Model (QBM) tool was nice, too, in that we could add the summary field by clicking on the right place in the dialog box, but it took some time to figure out which table to use as the master for the report.

Finally, we looked at what it would take to automate the printing of our reports. The idea here was to see how easy it was to create the custom action buttons that are one of the hot new features of these *Windows* databases. Printing a report, however complex, is a

Does the graphical interface of these new Windows products really make it easier to manage data than popular DOS programs like Q&A and Paradox do? And if so, how?

Express, if you think you'll need its capability later or if you're planning to expand its use to other areas of your organization.

For projects like our order entry and invoicing task that definitely require the capability to handle more than one data file at a time, you'll need a relational database. Approach, DataEase Express, Superbase, Access, and Paradox for Windows all fall into this category. These programs can be divided into two groups: Approach and DataEase Express, which are not programmable, and Superbase, Access, and Paradox for Windows, which are.

Of the nonprogrammables, *Approach* is the easier to use for projects involving just a few related tables. A good example is if you're

THE KITCHEN SINK IS

Our T4500C features an LCD TFT active matrix color screen that can display a kaleidoscope of 256 simultaneous colors from a palette of 185,193. Our T4500 offers a large, bright, easy-to-read 9.5" VGA display with 640 x 480 resolution and 17:1 contrast ratio.

A 150-pin expansion port lets you attach a SCSI adapter to the notebook. Or lets you attach the notebook to our Desk Station IV, providing true desktop capabilities in your office.

System control hotkeys save time by allowing you to quickly change your display setting, power management, security status, etc., without having to call up menus.

A generous 4MB RAM standard, expandable to 20MB.

Our award-winning keyboard features standard-sized keys and key spacing.

The T4500 series' advanced 20MHz i486"SX processor makes any 386 seem like a tortoise. In fact, tests reveal it's up to two and a half times faster than many 386-based notebooks.

The T4500C comes with a 120MB hard drive and our T4500 comes with a choice of an 80MB or 120MB hard drive.

3.3-volt chip technology decreases power / drain by as much as 25%, while adding up to 27% more battery life.

If you're getting the feeling the T4500 series represents a new standard in business notebook computing, you're right.



INTRODUCING THE

OPTIONAL.

The T4500C's dimensions: 11.7"W x 8.3"D x 2.0"H. The T4500's dimensions: 11.7"W x 8.3"D x 1.8"H. Both fit into half of a briefcase.

Windows® 3.1 and DOS® 5.0 with Ultrafont™come pre-installed.

AutoResume lets you start where you left off without rebooting and automatically saves your material when you turn the power off.

Our Quick Charge capabilities allow you to charge the battery while you're working.

Peaturing AutoResume, AutoSave, Advanced Power Management, and CPU Sleep Mode, our MaxTime™power management system helps you get the maximum out of every battery charge.

Quickread LCD status icons allow you to check a host of functions (including remaining battery time, keyboard status, and power-saving mode) at a glance.

An industry-standard PCMCIA 2.0 slot accepts removable hard drives, data/fax modems, network adapters, and other expansion options.

The BallPoint "mouse connects directly to the computer through a unique "one touch" QuickPort," so there's no cord to get in your way.

A front-loading floppy drive provides easy access.

Both the T4500 and the T4500C weigh in at about 6.5 lbs.

TOSHIBA T4500 SERIES



The T4500 features a large, easy-to-read 9.5" monochrome screen.



Tests reveal that the 3.3-volt 20MHz i486 SX processor is up to two and a half times faster than many 386-based notebooks.



You can call real-live Toshiba technicians toll-free for complete product support.





9 .

Point/Counterpoint

PC World asked our author, Celeste Robinson, and another database expert, Ellen Ullman, to offer a few personal comments on each of the programs in our review.

CR: For a project using a single file, I'd be torn between AceFile and Approach. For my taste, I didn't like FileMaker Pro as much.

EU: Yes, FileMaker Pro is a very low-end package, but I would recommend it if you need file portability between PCs and Macs.

CR: I found myself actually having fun using Ace-File. It's nice that you can link the tables.

EU: I agree. AceFile was a complete surprise. If AceFile would add just one more feature—the option of attaching filters and joins to forms and reports—the package would become vastly more usable.

CR: Approach is several steps up from AceFile. It's a good choice if you need relational capabilities. It's easy to validate data entry.

EU: This might be a good

time to introduce one of my criteria for judging these packages, which is what I call "database application widgets." These are the tasks you have to do over and over again. They include things like building a form or report based on multiple tables or verifying that some data element you've entered is valid by checking that it's in another table. A database application package shouldn't just be able to do these things with macro and function calls; it should make these widgets explicit operations you can enact with a click on an icon or dialog box.

CR: And you should be able to find the operations easily. You shouldn't have to write special expressions. The widget set is one big thing lacking in the high-end packages like Superbase and Paradox for Windows.

EU: Exactly. The high-end packages should take a lesson from Approach. Higher-end packages get all involved in complications like forms with embedded subforms.

CR: Moving up in capabilities, I have to say that I didn't like DataEase Express for Windows very much. The box is beautiful, but it

was difficult to find information in the documentation. It was hard to build a form with one-to-many relationships or accomplish referential integrity.

EU: At first I thought I would love DataEase Express. But I'm afraid it will please neither

The high-end packages should take a lesson from Approach. — Ellen Ullman



end user nor developer. It's too complicated for simple tasks, and, since it's not programmable, it's not powerful enough for many real-world applications.

CR: As for the high-end packages, I would say that they're not for the novice or the person who needs to work with just one file. However, for the intermediate user, these products

should work very well without the need to hire a developer.

EU: Paradox for Windows gives you the ability to really see the visual relationships among tables, which shows that Paradox truly understands how database applications are built.

CR: Yes, Paradox for Windows is my fa-

vorite in putting together multitable documents automatically. You can look at the design layout and see exactly how it's going to work. You can go click-click and see it change. You can experiment, in contrast with Access. I tried the Form Wizards and still got lots of cryptic messages. Access has a good dialog box to set up searches, but

For a project using a single file, I'd be torn between AceFile and Approach. —Celeste Robinson

then the search dialog box obscures the data that you found.

EU: I had similar usability problems with Access. For example, if you get an error message while inputting data to try out a table definition, you can't suspend the input window and take a look at the table definition.

CR: Access does have one very hot feature. When you're querying a huge amount of data, the package will present the dynaset, or answer set, on the screen before the entire search is completed. You can start working with the information right away.

EU: I think querying is the strong point of Access. I give it high praise for letting you switch back and forth between visual query writing and SQL. Just as Approach is my model for how a tool should accomplish one-to-many forms, Access is my model for the scalable visual-to-SQL query tool.

Superbase was the real sleeper in the highend group. It's not flashy, its widget set is small, but I found it straightforward. And Superbase has the advantage of being a 2.0 release. Access and Paradox may have been rushed to market for competitive reasons.

CR: The issue is, which package makes it easiest to manage your data. Once you strip those graphical features off the menus and tool bars, what are you left with? From the business user's point of view, it's easy to lose sight of the real issue: managing your data.

EU: My ideal database would have the application focus of DataEase Express and the great, easy widget set of Approach. It would

have the query capabilities of Access. And it would have the visual data modeling of Paradox and Superbase.

CR: My ideal database would have the form widgets of Approach, the data modeling of Paradox—and the fun of AceFile.

Ellen Ullman was a principal engineer for the clientside tools for Sybase SQL Server. She is currently a consultant with Ideation, a San Francisco-based newproducts consulting firm.



trying to integrate data from two or three departments but not your whole organization. The program lets you gather information from a variety of sources, including *Paradox*, *dBASE*, and various SQL formats, and quickly design good-looking reports and forms for a few related tables with little effort. However, when you get into more complicated situations, the timesaving dividend of *Approach*'s simple user interface starts to disappear. *DataEase Express*, with its

Query By Model tool that essentially combines the process of querying and reporting on data, offers more functionality than *Approach* but also takes more effort to master.

If you're a power user with some fairly sophisticated relational databases to manage, but you don't want to get into programming if you can help it,

Approach, DataEase Express, Paradox for Windows, or Access would probably work best for you. You could use Superbase as well, but it doesn't have as many end-user conveniences. The weaknesses of these products show up in different areas, so choose carefully to make sure the Achilles' heel of the one you pick doesn't ruin your project.

For application developers who feel that forms with macro-driven action buttons can't do enough, there's *Superbase*, *Access*, and *Paradox for Windows*. Each of these database managers includes its own programming language. The capability to program a database application gives you much more flexibility for those times when menu commands just aren't enough. However, it also requires a consider-

able time investment to become familiar enough with a programming language. The languages of these three are fairly equivalent in power and can call routines written in other languages.

Any of the three programs could be used to build a database system for a large organization with many disparate groups and data requirements. Superbase is the most straightforward but has the fewest features. Paradox for Windows would be great for anyone

For projects like our order entry and invoicing task that definitely require the capability to handle more than one data file at a time, you'll need a relational database.

moving over from the DOS version of *Paradox*—despite a completely new programming language—because the querying model remains the same. *Access* is probably the hardest to learn initially, but, with its features, it's easiest to use in the long run.

Celeste Robinson is a contributing editor for PC World and the author of The Paradox 4.0 Handbook (Bantam Computer Books, New York, 1992). She can be reached as CELESTEROB on PC World Online (see page 10 for more information).

For more information about all products in this article, circle reader service no. 900.

PC WORLD TEST CENTER REPORT

Database Performance: No Clear Winners

	Find on record key	Find on name	Simple query	Joined query	Customer report
FileMaker Pro for Windows 2.0*	1	1	5		
AceFile 2.0	1	50	25	1093	1091
Approach for Windows 2.0*	1	1	3	2984	599
DataEase Express for Windows 1.0	1	4	3	940	1340
Superbase 2.0 for Windows	1	26	58	1884	1214
Microsoft Access 1.0*	1	21	7	43	2258
Paradox for Windows 1.0	1	8	7	81	2733

*Best Buy

Time in seconds.

*Couldn't complete test.

Methodology Performance tests are different from the application tasks used to evaluate database functionality. These tests evaluate performance on basic database operations.

We tested the Windows database programs on a Compaq Deskpro 386/251 configured with 8MB of memory and a 110MB hard drive. Before installing each of the applications, we set up the hard drive with Compaq DOS 5.0 and Windows 3.1 running at 640-by-480-pixel resolution with 16 colors (standard VGA). To build the test files, we imported our order entry database into the product's

native format (or the default format if no native one exists). We used four tables in our tests: a list of employees (1000 records), a list of additional information about those employees who are sales representatives (50 records), a list of customers (5000 records), and a list of orders (about 33,000 records). We indexed each table on a unique field.

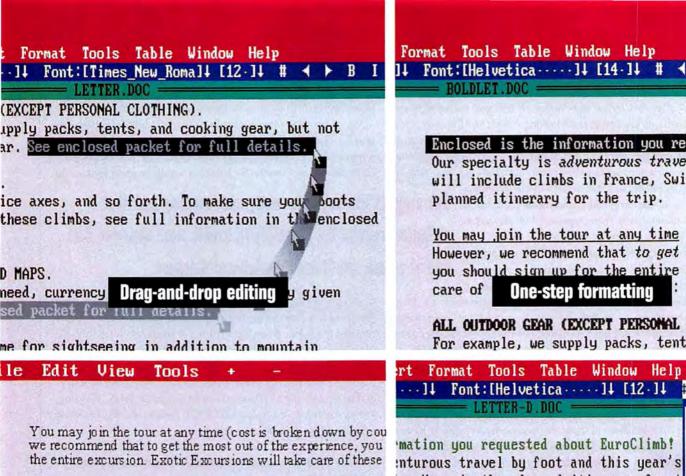
Find on record key We measure the time required to find a customer's record based on its customer key.

Find on name We search for the same customer record based on a subset of the company's name (this particular record is located about two-thirds of the way through the data file). We did not index this field. Simple query We use the product's query-by-example or record filter tool to view 1511 of the customer records selected by a ZIP code range.

Joined query This test and the next cull records from several joined tables. We ask the program to display a list of all orders generated by salespeople earning more than \$55,000.

Customer report We measure how long the program takes to generate a report file listing each customer grouped by sales representative.

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



- ALL OUTDOOR GEAR (EXCEPT PERSONAL CLO For example, we supply packs, tents, and cooking gear, b rain gear. See enclosed packet for full details.
- ALL CLIMBING GEAR. Ropes, crampons, ice axes, and so forth. To make sure yo suitable for these climbs, see full information in the enclo
- LOCAL CURRENCY AND MAPS. All the maps you need, currency for the first day in any g Again, th

Automatic bullets We've include addition to moun so plan to bring any clothing and spending money that you wil casual travel. We hope you can join us - it will be an adventure

Tools

Edit

View

AUGUST

SUNDAY	нонрач	TUESDAY	WEDNESDA
	milit	1 Leave New York for Paris	Rest one day at L'Hotel du Roi
6 Preparation	Lines and b	orders	9 Climb
13	14	15	16

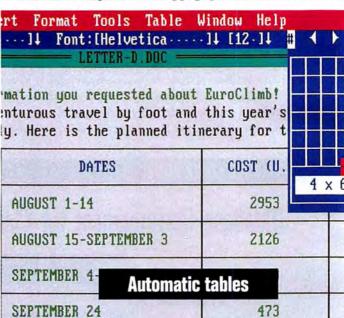
Enclosed is the information you requested

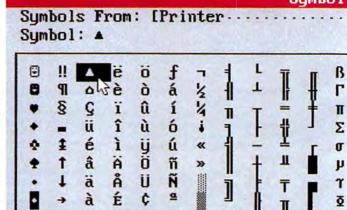
Tools Table Window Help

Our specialty is adventurous travel by fo will include climbs in France, Switzerlan planned itinerary for the trip.

You may join the tour at any time (cost i However, we recommend that to get the mos you should sign up for the entire excursi care of **One-step formatting**

ALL OUTDOOR GEAR (EXCEPT PERSONAL CLOTHIN For example, we supply packs, tents, and





Special symbols

θ

Ω δ

æ

Æ

ç

¥

UPGRADE TO NEW MICROSOFT WORD 6.0 FOR MS-DOS FOR \$99. AND BECOME A MASTER OF MANIPULATION.

Take a few shortcuts and make your everyday tasks a whole lot easier. Just upgrade to new Microsoft Word 6.0.

To start with, you can automatically add bullets to highlight key points. Or create a table with a single click on the new ribbon. Editing is a snap: use drag-and-drop editing to move text anywhere on the page. Then go back to the ribbon for one-step bold, italic, or underline formatting.

You can just as easily insert commonly used symbols like ©,™, §, and a. A few simple clicks and it's done. And with True Type fonts, the crisp text you see on your screen is the same text you'll get in your documents – on just about any printer.

Need more impact? Add lines, borders, and shading in one quick step. When all is said and done, run your work through the grammar checker to make sure it's all buttoned up.

With Word 6.0, you'll create polished and professional documents every time.

Right now you can upgrade to Microsoft Word 6.0 for MS-DOS* for \$99* and get a 90-day money-back guarantee.** Upgrade today. And see how Word 6.0 can help you become a master manipulator. So make the call.

St. WORD

To get a copy, see your local reseller.
For the name of a reseller near you,
or to order by phone, call
(800) 468-8899 and ask for Dept. JD4.



Make your word processing easier with new drag-and-drop text editing, one-step formatting ribhon, automatic bullets, automatic tables, lines and borders, and special symbols.

FileMaker Pro for Windows 2.0

PROS: Simple, clean, Macintosh compatibility

CONS: Lacking in high-end features

The slick FileMaker Pro was a hit with Macintosh database users, and Claris is now promoting it for Windows as well. Like a contender for the heavyweight title, it has a lot of show and some real punch. FileMaker Pro is a flat-file database that will let you look up and fill in data from one file to another—but that's the extent of its relational capabilities. It passed our first test easily, but we ran into problems on the more advanced scenarios, which involved working with multiple files.

Notably, the program runs in both the Windows and Macintosh environments and shares files across these platforms. A fairly extensive set of security features lets you set up passwords and groups of users with access privileges that define the kinds of activities a user can perform with a file.

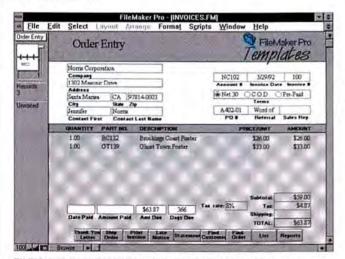
Another of *FileMaker Pro*'s unique features is its variable-length text fields. These simplify the process of creating a data file but come with a few inconveniences. For example, when you design a new layout, you may have to spend some time resizing field objects because the length of the defaults may be quite different from the size of the values you'll be storing in the fields.

An interesting feature that deserves special mention is *FileMaker Pro*'s repeating fields. When you define fields for a file, you can specify that one or more fields be repeated a fixed number of times. This allows you to create repeating sets of data like those you would see on an invoice with multiple detail items.

The templates that come with FileMaker Pro are easy to figure out and to adapt to your needs. Also worth noting is FileMaker Pro's ScriptMaker feature. You can quickly pick actions from a macro list and associate them with buttons you place on your forms to automate many database tasks with a few mouse clicks. If you don't need relational capabilities, can live with the fixed number limit of the repeating fields feature, or need Macintosh compatibility, Best Buy FileMaker Pro is a winner by decision.

List price: \$399. Contact: Claris, 408/727-8227.

Reader service no. 607



FILEMAKER PRO INCLUDES A GREAT SET OF TEMPLATES that you can customize for your own work.



ACEFILE LETS YOU JOIN TWO TABLES to create a new data file or define relationships to simulate linked table views.

AceFile 2.0

PROS: Simple, graphs, cross-tabs, inexpensive

CONS: Forces use of macros too often, lacking in high-end features

Like a small runabout car, AceFile is easy to get familiar with and fun to use. It's slower than FileMaker Pro and requires a little more work to customize data entry. Unlike FileMaker Pro, AceFile lets you create graphs and cross-tabs and includes a telephone dialer.

Two features push AceFile to the upper edge of what's possible with a flat-file program: the Relate and Join commands. With the Relate command, you can define, using common fields, several levels of relationships between data files. Then, when you select a record in your top-level table, AceFile automatically highlights the first associated record in any related tables.

AreFile's Join feature lets you link two tables to create a new table. You can report on the resulting table, effectively getting around AreFile's limit of reporting from only one table. But you can suppress only one field of repeating information in a report, leading to unnecessary copies of the other fields.

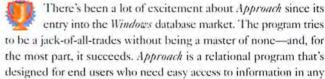
To its detriment, AceFile requires macros to set up lookups, pick lists, and incrementing fields, and it lacks a security system. For simple database projects that require a minimal amount of file linking, AceFile should handle your work well, if you don't mind writing macros to get custom features.

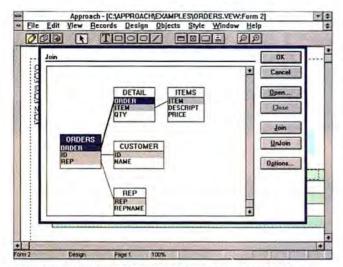
List price: \$199. Contact: Ace Software, 408/451-0100.

Reader service no. 608

Approach for Windows 2.0

PROS: Simple design tools, great point-and-click interface **CONS:** Lacks programmability and some high-end tools





WITH APPROACH, YOU CAN JOIN TABLES for a form or report by just dragging your mouse to link the tables.

of several formats, including dBASE, Paradox, FoxPro, Oracle SQL, and Microsoft SQL Server. It lacks the application development tools of Superbase, Access, and Paradox for Windows but includes enough point-and-click tools to make it a good candidate for fairly simple relational database projects.

One of the best features of the program is its simple process for defining relationships between tables. You don't have to worry about setting up indexes for your tables before you relate them, as you do with some of the other relational programs. Approach sets them up automatically and keeps track of them for you. The process of creating a two-table form for our follow-up report was as easy as ordering lunch—and took about as long. But we discovered some potential pitfalls while using five related tables for our order entry/invoicing task. If you don't highlight the right master table when you add tables to either the main part of a form or a repeating panel, you can have trouble entering data later. This problem should be clearly documented so that you don't make a mistake, or the program should use a different method.

Approach includes abundant options for customizing data entry by just pointing and clicking. You can add lookups, incrementing fields, default values, pick lists, field formatting, and other checks without writing any macros or expressions (a code word meaning that you need to know the proper syntax for entering what you want). And although Approach doesn't include style sheets in the manner of DataEase Express, you can easily set your preferred defaults for screen elements like field and label styles and fonts and for treatment of pictures.

There are places where the user interface could be improved. In the case of creating multitable forms or reports, you can have problems if the proper table name isn't highlighted when you close the Create dialog box. This pitfall wouldn't be a big deal except that you can't change the tables used in a document once it's created—unlike in other relational programs, you have to design a new form or report from scratch. *Approach* completed the fourth task, summarizing sales by salesperson, with greater difficulty because of its complexity. The program's ease of use in some areas balanced its limitations with larger numbers of files, so it took about the same amount of time to complete the tasks as the other programs over-

all. Best Buy Approach probably has all the tools you need to manage your information, especially if you can do without the programmability of more high-powered databases such as Paradox for Windows and Access. Because it handles moderately difficult tasks well, it could also replace a flat-file database, should you decide you may need more capabilities in the future.

List price: \$399. Contact: Approach Software, 415/306-7890. Reader service no. 609

DataEase Express for Windows 1.0

PROS: Good range of features, Query By Model tool CONS: Spotty user interface and documentation

Somewhere at the core of *DataEase Express for Windows* are two conflicting directions struggling for dominance. *DataEase Express* is marketed as a tool for end users rather than programmers. Yet it's oriented to application design. This conflict in character limits the extent to which we can recommend it for novice database users.

We were able to review only version 1.0 of *DataEase Express*, but version 1.1 will be available by the time you read this. The new version supports more import/export options and lets you access data in *dBASE*, *Paradox*, several popular SQL, and other formats.

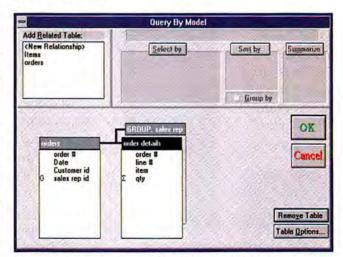
DataEase Express has a wonderful variety of field types, such as Choice for creating pick lists, which simplify the process of putting data entry checks in a table. But for a few other tasks, you have to create "derivation formulas" or "validation formulas" to get custom data entry features.

One of the most powerful tools in *DataEase Express* is Query By Model, which lets you choose the tables, relationships, fields, and record selection criteria for a report all from one dialog box. You can even add summaries and sorts to the report or group data within it by clicking in the right places.

DataEase's complexity derives from the relational capabilities it provides. It already has some of the ease-of-use features it needs, but with clearer documentation and better signposts in the user interface, it could hit the mark precisely for its intended audience.

List price: \$395. Contact: DataEase Int'l, 800/243-5123.

Reader service no. 610



DATAEASE'S QUERY BY MODEL TOOL lets you relate tables and sort, group, and summarize data for a report all from one dialog box.

This is one Local Bus you'll

Why settle for the bottleneck of slow video or sluggish hard drive performance?

With Insight's new VESA* Local Bus* compatible system you don't have to.

These systems come standard with a 32-Bit VESA* Local Bus compatible video card and a 32-Bit VESA* Local Bus compatible IDE hard drive control- ler to give you top performance in both video and hard drive.

In fact, you can expect a 400% increase in hard drive performance. And video performance that's nearly double that of our nearest competitor.

With VESA video and hard drive, graphic intensive programs will pop onto your screen. And your numbers will crunch at awesome speed. How? Peripherals running from adapters on the CPU's local bus will run at full clock speed, rather than 8 or 12MHz as on a 16-bit ISA bus.

What's more, the Insight VESA* Local Bus* is upgradable.

With our 238pin ZIF (Zero Insertion Force) OverDrive™ socket for Intel's next generation processor based on the Pentium™ architecture, you'll keep current with the newest technology.





Comparison based on sequential read tests performed on a 16-bit controller and the new VESA Local Bus™ compatible IDE 32-bit controller.



Note the extra row of pin holes. That's for the upgrade to Intel's OverDrive™ based on the Pentium™ architecture!

The time is now to move up to Insight. According to PC Sources magazine, "A better balance of CPU hard drive and video throughput means better overall applications performance."

Why wait to break the information bottleneck? Call us today and we'll get you up to speed. Fast.

We're here 24 hours a day, seven days a week to help customize your system.

And you won't be left high and dry once the sale is complete. Your Insight 486 VL system comes with a 30-day "worry-free" money-back guarantee and a one-year Warranty/ Replacement Policy.

Of course, we accept all major credit cards and offer leasing plans with low monthly payments.

Ask about the Insight Credit Card, too. It's convenient, no annual fee, no down payment, with low monthly payments.

Call now and see how affordable it is to "Buy the Super Direct™Way".



never have to wait for.



Insight 486 VL Full Vertical

Fully upgradable Intel 80486 CPU 2 VESA Local Bus™ compatible slots 4MB RAM - 128K Cache 250MB 12ms IDE Hard Drive 32Bit Local Bus™ compatible IDE Controller 32Bit Local Bus™ compatible 1MB Graphics accelerator Super VGA Card

14" Non-interlaced Super VGA Color monitor 1.2MB 5.25" Floppy Drive 1.44MB 3.5" Floppy Drive

2 Serial Ports, 1 Parallel Port Enhanced 101 Key Keyboard MS-DOS 6.0 Mouse Full Vertical Case Free Lotus WorksTM Software

> 486DX2-66MHz \$2,299

486-33MHz 486DX2-50MHz \$1.999 \$2,199

Add these great values to your Insight or other PC system:

Insight 15" Monitor
A must for windows users! High resolution autoscan, 15" flat square anti-glare screen. Up to 1024 x 768, non-interlaced, .28mm dot pitch, detachable tilt and swivel base. \$399

Talon TA-2000 Multimedia Kit

A complete, top-of-the-line multimedia kit including a Talon TA-200 CD-ROM drive:

1A-200 CD-ROM drive.

* 280ms access time * Multispin * 64K buffer * 300KB transfer rate * Sound Blaster™ compatible sound board

* Amplified stereo speaker set * Stereo headphones * Installation manual * Free CD software- Toolworks Multimedia Encyclopedia, Software Jukebox, Guinness Disc of Records, The Animals, National Parks Guide, Sherlock Holmes and The Mayo Clinic Family Health Book. ODTA2000MK.......\$699

Talon™ by Colorado 250MB internal tape backup Standard QIC attaches to existing floppy controller. 2-3MB/minute, with data compression.

2 FREE tapes included.

340MB Western Digital IDE Hard Drive

WD234ØA, 12ms, 3.5", 1"H Bare Drive Kit..... Upgrade from 250MB.....





(800) 359-0322



Insight Distribution Network, Inc. 1912 W. 4th St., Tempe, AZ 85281 Local 602-350-1176 Fax 602-350-1150



Shipping is non-refundable. Lease figures based on 24-month F.M.V. lease, sales tax not included. Leases are non-cancelable and may require a deposit. All trademarks are the properties of their repective owners. Intel Inside is a registered trademark of Intel Corporation. 693

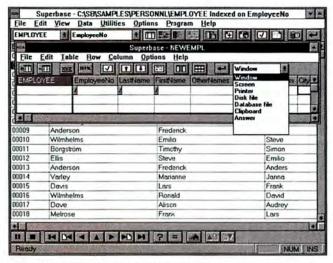
Superbase 2.0 for Windows

PROS: Powerful, straightforward

CONS: Few design tools, no built-in macros

Superbase is the granddaddy of Windows databases. It's the only high-end program here in its second major version, and the experience of the first lifetime shows. It was straightforward work to sit down with Superbase and its excellent documentation and figure out how to complete our first four tasks. Unlike some of the other relational programs, Superbase didn't present too many quirks; we didn't have to try a job several times before getting it right.

One noticeably weak area is *Superbase*'s default forms and reports, which are pretty plain. Also, the program lacks an easy way to switch back and forth between design mode and the mode in which you see forms or reports containing your data. This deficiency hampers the process of modifying documents or setting up a new design. A point in *Superbase*'s favor: It was quite simple, after a



SUPERBASE LETS YOU USE QUERY BY EXAMPLE to ask questions about your information or to update data files.

FEATURES COMPARISON

Windows Databases: The Details Matter

BEST	BUY	BEST	BEST BUY		BEST BUY		
Yes No n/a = not applicable	FileMaker Pro for Windows 2.0	AceFile 2.0	Approach for Mindows 2.0	DataEase DataEase Express 1.0	Superbase 2.0 Superbase 2.0 for Windows	Microsoft Access 1.0	Paradox 1.0 Paradox 1.0
List price	\$399¹	\$199	\$399	\$395	\$795	\$495	\$795
File formats directly supported							
Popular PC formats	FileMaker Pro	dBASE	dBASE, Paradox, FoxPro	DataEase, Paradox, dBASE ²	Superbase, dBASE	Paradox 3.x, dBASE, Btrieve, Access	Paradox, dBASE
SQL access	0	0	•	•3	•4	•	•3
Export/import formats							
Popular PC formats	D, 1, E, T ⁵	D, 1, T5	D, 1, E, P, T ⁵	D, 1, P, T 3, 5	D, 1, E, P, T ⁵	D, 1, E, T ⁵	1, E, Q, T ⁵
Relational capabilities							
Number of tables that can be linked	lookups only	10 for table views	10	100	6	32,768	
Link tables in forms and reports	0	0	•	•	•	•	•
Database-level referential integrity	0	0	•	0	•	•	
Form-level referential integrity	0	0	•	•	•	•	•
Point-and-click data checks							
Lookups, pick lists	•	•7	•	•	•8	0	•
Incrementing fields	•	•7	•	•	•8	•	0
Data presentation							
Style sheets or preference setting for objects	0	0		•			•
Avery label layouts included	•	•	•	•	0	•	0
Cross-tabs	0	•	0	0	0	•	•
Graphs	0	•	0	0	0	•	•
Automatic linking of data files	n/a	n/a	0	•	•	•	•
Point-and-click multitable layout design	n/a	n/a	•	•	•	•	•
Experts, Wizards, or other guides	0	0	0	•	0	•	•
Attach filters to documents	0	•	•7	•	•	•	•

quick look in the documentation, to link tables and use them in multitable forms. And once these forms were completed, there were no hassles during data entry.

Though the user interface has problems in places, Superbase includes several niceties, such as an easy-to-manipulate table view, messages that can be turned on and off as desired, well-indexed documentation, and hot keys listed on the menus. The Query by Example facility works similarly to the QBE made popular by Paradox for DOS, and the program includes communications software.

Superbase hasn't done well in previous PC World reviews. However, this latest revision has improved the program dramatically. Overall, even with its programming capabilities, Superbase is fairly user-friendly. In comparison to Access and Paradox for Windows, it may seem a little plain, and it definitely lacks razzle-dazzle features like direct edit of query results. But for a relational program that really manages data, Superbase can hold its own.

List price: \$795. Contact: Software Publishing, 408/988-7518. Reader service no. 613

Microsoft Access 1.0

PROS: Powerful, good design tools, macros CONS: Difficult to learn, idiosyncratic

Access has created a huge stir in the Windows database market, in part because of the initial offer to sell it for \$99 (it's now \$495). Another reason is the report of serious bugs when the program is used with very large sets of data. These bugs should be fixed by the time you read this.

Access's treasure trove of neat features really makes some complex tasks a snap. However, unless you're already a power database user, don't expect to just fire up the program and start whipping out forms and reports. Even though Access is marketed as user-friendly, you need to be willing to put in some time to discover how it does things.

Access's relatively steep learning curve becomes apparent as soon as you try to work with data from multiple tables in the same form or report. Unlike other programs we looked at, where tables don't

BEST	BUY	BEST	BUY		BES	BUY	
	FileMaker Pro for Windows 2.0	AceFile 2.0	Approach for Windows 2.0	DataEase Express 1.0	Superbase 2.0 for Windows	Microsoft Access 1.0	paradox 1.0 for Windows 1.0
ueries	\		1			1	
QBE, QBF	•	0	•	•	•	•	•
Experts, Wizards, or other guides	0	0	0	•	09	•	•
Embed SQL requests	0	0	•	0	•	•	•
Edit query results directly to update original	•	•	•	•	0	•	0
Create from form or report	•	n/a	0	•	0	•	•
ecurity							
Group or application level	•	0	0	•	0	•	•
Table level	•	0	•	•	•	•	•
Field level	•	0	•	•	•	•	•
ata types supported							
Text, numeric, date, binary	•	•	•	•	•	•	•
Time	•	0	•	•	•	•	0
Memos	•		•	•	0	•	•
Currency	•	•	•	•	•10	•	•
Counter	0	0	0	•	●10	•	0
Logical	•	•	•	•	●10	•	0
application development							
DDE and OLE	0	•	•	•		•	
Point-and-click action-button definition	•	•7	•	•	0	•	•
Programming language	0	0	0	0	SBL	Access Basic	ObjectPAL
Run time	0	0	0	0	•	0	•
Supports calls to DLLs	n/a	n/a	n/a			•	

⁵ D = dBASE, 1 = 1-2-3, E = Excel.

⁶ Limited by disk space.

¹ In forthcoming release.

4 Requires SQL Library add-on.

1 \$99 for Q&A users, including translator, before

² DataEase currently supported; all other formats

to be supported in forthcoming version.

June 30, 1993.

Requires macro. P = Paradox, Q = Quattro Pro, T = text.

⁹ Through programming. 10 With data formatting. 8 Requires expression.

Bonanza Bargains Backed By



If you can find a PC that meets or exceeds our equivalent specification, but is shipping at a lower advertised price, we'll beat that price.





NOW ON SCHEDULE

1-800-862-3088 FAX: 1-214-888-5783 GSA#: GSOOK

93AG5-6319



ompudyne is the PC manufacturing and direct marketing arm of Comp USA", The Computer SuperStore (NYSE symbol: CPU)—inventors of big volume, deep discounting PC retailing, and the largest chain of computer super stores in the country. Compudyne manufactures top quality, fully-supported computers as available from only the largest PC manufacturers, at prices typically found only at garage shop clone houses. Result? We're already one of the largest direct PC companies in the country and guarantee that our prices are the lowest of any currently advertised.

Notebooks

Tons of features in a 51/2 pound package! All our notebooks include these handy features:

- * 11" x 8.5" x 1.6" (That's small!)
- · Full 10", 64 grayscale brilliant VGA screen
- · Internal 31/2" 1.44 MB floppy drive
- · Convenient built-in trackball
- External SVGA monitor and keyboard support
- Full keyboard—dedicated 'page up/down', 'home' and 'end' keys
- · Built-in serial (2) and parallel (1) ports
- * Expansion station option
- User-installable FAX modem and other options
- 386s: RAM: 2 MBs standard, 4 & 6 MB options; Battery life: 3.5+ hrs.
- 486s: RAM: 4 MBs standard, 8 & 20 MB options; Battery life: 2.5+ hrs.
- Preloaded with Microsoft® DOS 6.0, Windows™ 3.1 and Lotus® Organizer ™

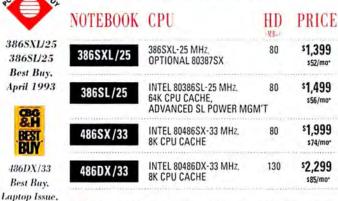
WARRANTIES

- ► 30-day, no-questions asked, return policy.
- · One year limited warranty.
- Extended warranty available.

SERVICE & SUPPORT

- ► Toll-free technical support.
- On-site service for desktopst.
 Training classes available.

Navigation made easy with full size 84/85 key keyboard with 36 function keys including arrow keys laid out in an inverted T formation and trackball.



"With a Graphics Winmark score of 2.3 million, the Compudyne
486DX/33 gives you desktop performance and storage
in 7.6 pounds of travel weight." (8/92)

"...You'll be hard-pressed to find a unit with a better blend of speed, portability, and quality construction than the SlimNote." (8/92)

"The Compudyne SlimNote 4DX/33... (uses) a marvelous design that wraps a 33 MHz 486DX in a package just over PCComputing (19/02)

Magazine quotes courtesy of: PC Computing, December 1992 pg. 78, ©1992 Ziff Communications Company, PC Sources, reprinted from PC SOURCES, August 1992, ©1992 Coastal Associates Publishing L.P., PC Bus so potional at an additional cost. V Must be returned "as new" in original package. "Leasing arranged through Leasing Group, Inc. payments based on 36 month open-end rate. Prices and specifications CommUSA Super-Store.

Sept. 1992

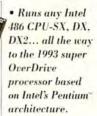
A Billion Dollar Business.





State Of The Art Upgradable VESA Local Bus Board





- · Just pop the upgrade into our Low Insertion Force socket. change settings and go!
- · Latest 32-bit chipset with up to 256K write-back cache for high performance.
- Includes (2) serial, (1) parallel. and (1) game port and support for 2 floppy & 2 IDE hard drives built into the motherboard. No switches or jumpers. It's entirely configurable through the BIOS.

DIAL TO SAVE

DOLLARS

1-800-

862-3081

DESKTOP

486SX/25"

486SX/33"

INTEL 80486SX-25 MHz, **8K CPU CACHE**

INTEL 80486SX-33 MHz **8K CPU CACHE**

INTEL 80486DX-33 MHz 486DX/33 CACHE 128K CPU CACHE

486DX2/50 CACUE INTEL 80486DX2-50 MHz

TOUDAZ/JU CACIIL	128K CPU CACHE

ARCDVA/CC CACHE	IN IEL 00400DXZ-00 MINZ
486DX2/66 CACHE	128K CPU CACHE,



RAM/HD

4 MB/ 120 MB HD
4 MB/ 170 MB HD
4 4407

210 MB HD 4 MR/

210 MB HD 4 MB/ 245 MB HD

8 MB/ 330 MB HD

VIDEO BOARD/MONITOR

16-BIT VGA CARD/	\$999
14" 800 x 600 VGA COLOR MONITOR	\$37/mo*
16-BIT SVGA CARD/	\$1,199
14" 1024x 768 SVGA COLOR MONITOR	\$44/mo*

16-BIT TRUE COLOR SVGA 1 MB VIDEO CARD / 14"1024x768 SVGA .28 DOT PITCH NON-INTERLACED COLOR MONITOR



186SX/25 Best Buy. Dec. 1992



486DX2/66 Nov. 1992

Pick a pre-configured PC or configure your own! Every system includes:

- · 1.2 and 1.44 MB floppy drives (except 486SX systems)
- · 6 I/O board slots
- · 200 watt power supply
- · 101 key AT-style keyboard
- · Preloaded with Microsoft DOS 6.0 and Windows 3.1
- · Microsoft compatible serial mouse
- · U/L listing; FCC certification

Lightning Video Family...

Looking to fire up your video performance? Choose from our line of super-fast VESA Local Bus video cards. up to 50 MM Winmarks (v. 3.11). They turn your applications into speed demons!

Get Horizontal...

Our standard desktop systems feature a rugged plastic-over-steel construction with "one screw" assembly for quick 'n' easy upgrades. They support 3 externally accessible 5.25" and 2 internal 3.5" drive bays.

Get Vertical...

Our mini-towers offer an amazing 6 drive capacity in a tiny 8"x 16" footprint: 4 externally accessible, plus 1 internal 5.25" and one internal 3.5", for only \$100 more.

Choose From More Fun Stuff:

- · Displays: Mono or color VGA: 1024 and 1280 interlaced or non-interlaced; 14", 15", 17" and 21".
- · Hard Drives: 120; 170; 210; 245; 330; 420; 535; 680 MBs or 1.2 GBs & larger.
- · Complete Multi-Media Kit: including CD-ROM, Sound board, speakers and tons of software.
- · Internal FAX/Modem: 9600 bps send/receive fax: 2400 bps modem; including WinFax or Quicklink Software.
- · And Much, Much More ... we stock over 5000 name brand products!

\$1,599

\$1.799

\$67/mo*

\$1.999

\$74/mo*

\$2,299



IN CANADA 1-214-702-0055 24 HOUR FAX 1-214-888-5743 CORPORATE CREDIT AND





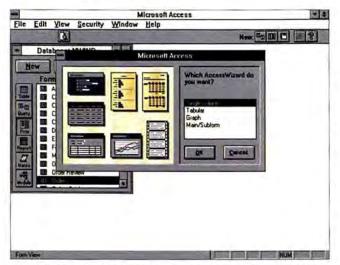






Magazine reprinted form PC Magazine, August 1932, @1992 Ziff Communications Company 1 Within the continental United States 11 Features only one floopy drive of your choice and standard 486 motherboard. The Local subject to change without notice - Intel® 336 & 486 & the Intel Inside logo are trademarks of Intel Corp. 10/10/8 Trademarks belong to their registered owners. Each system unit will be shipped from the nearest

WINDOWS DATABASES



ACCESS'S FORM WIZARD prompts you through creating a form, even for multiple related tables, as in our order entry task.

need to be keyed before being joined, Access enforces stringent rules regarding joins. And keying tables is not an intuitive task.

Yet if you make it past the initial hump of keying and relating tables, being able to use the Form and Report Wizards for related tables makes the effort worthwhile. The Wizards prompt you through the process of designing forms and reports, leaving you with document layouts you can then customize to your heart's content. The Wizards provide enough capability that we were able to use them to create all the forms and reports for our tasks. But the documentation for the Wizards is incredibly short, considering what they can do.

Other Access strong points include querying and its macro language. But again, you'll probably have to acquaint yourself with these functions through the documentation or the Cue Cards, an innovative extension of the program's on-line help system.

Overall, Best Buy Access is a powerful tool that has most of the features that any power user or application developer could need, plus a few extras. It has a rich set of macros that can be attached to buttons, and its own programming language, Access Basic. But if you're a beginning database user, be prepared to hit the books or the Cue Cards to deal with the program's idiosyncrasies.

List price: \$495. Contact: Microsoft, 800/426-9400.

Reader service no. 612

Paradox for Windows 1.0

PROS: Powerful, good query tools, good programming language

CONS: Difficult to summarize calculated fields

Like Access, and like an octopus, Paradox for Windows reaches out in all directions. It includes many features that appear to be designed for the end user, yet at the other end of the spectrum, it also has its own programming language, ObjectPAL. The result is a database manager that can jump through all the hoops but is short on the end-user conveniences found in some of the less-powerful products.

Paradox for Windows quickly accomplished our first test task with no problems. You can assign various data entry checks (including lookups), define indexes, set passwords, and even define referential integrity all in the same dialog box—a nice capability. With Speedbar buttons for Quick Forms and Reports (even Quick Cross-tabs and Graphs), simple forms and reports are a snap.

For both of our multitable forms, *Paradox for Windows*' Data Model, the dialog box you use to specify the tables and relationships for a document, made short work of naming and relating the tables. With the proper keys in place, *Paradox/Win* was able to correctly guess how the tables should be linked for the two-table form.

Although it was extremely easy to get decent default form and report layouts, even with several related tables, we ran into problems trying to add the summary information to our order entry form and invoice report. Unbelievably, *Paradox for Windows* will not allow you to summarize a calculated field either on a form or in a report easily—an incredible oversight, especially since *Paradox* for DOS can do it. Sure, you can do the calculation in a query and then report on the results for an invoice, but for a form you need to enter the calculation's result manually or use some trick to store the data in a real field for summarizing. In either case, you shouldn't have to work so hard to accomplish such a common task.

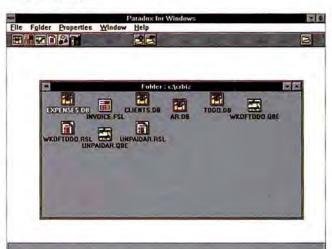
Paradox for Windows retains the easy-to-use Query by Example facility first popularized in its DOS version. One great new feature lets you base a query on a form or report. If the form or report you specify includes linked tables, Paradox/Win automatically joins the tables for you in the query window.

Defining action buttons for forms is not easy. You have to write "methods" in ObjectPAL and attach them to buttons. There are no predefined macros to choose from, unless you want to hunt through the sample code that comes with the program. Also, *Paradox* for DOS users should note that programs written in PAL (Paradox Application Language) will not run under *Paradox for Windows*.

Paradox for Windows is very much like Access in its range of capabilities. It provides good relational tools, has an extensible programming language, and offers lots of extras, such as graphing and its Object Inspector, which lets you quickly change the properties of almost any object you see on screen. The program is not for casual users, though. To make the best use of Paradox for Windows, you must be willing to spend some time discovering how it works.

List price: \$795. Contact: Borland Int'l, 800/331-0877.

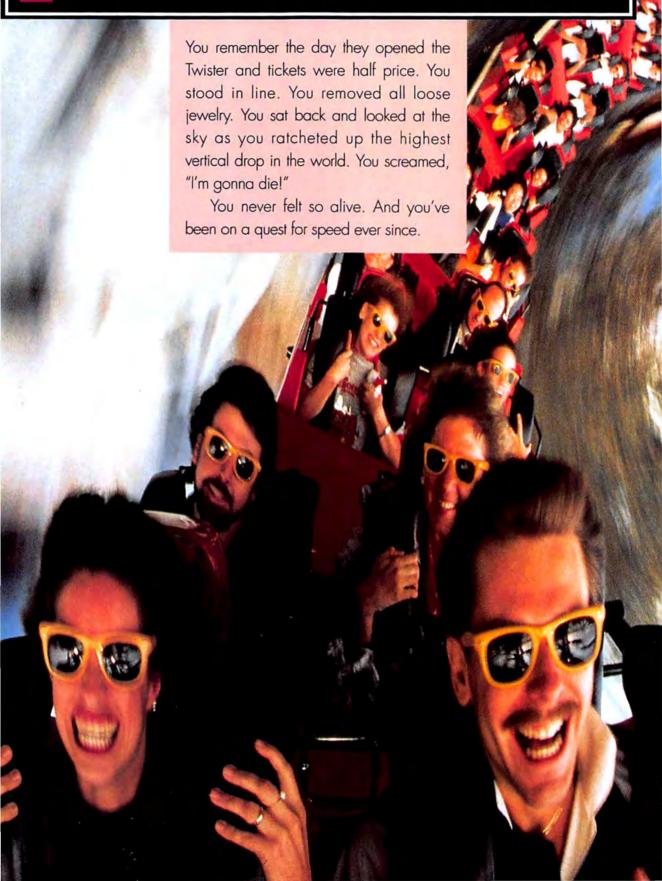
Reader service no. 611



WITH PARADOX FOR WINDOWS, you can create a Folder for tables, forms, reports, and queries and open them with a single mouse click.



magine getting this kind of thrill from a PC.





6 full-size ISA slots

give you room for plenty of options.

Compact design

Everything fits into a 17" x 7" x 17" micro-tower enclosure.

"Holds more in less space." PC Magazine, April 13, 1993

Network certified

Every DECpc MT is tested and certified compatible with Novell™, NetWare™ and Digital PATHWORKS™.

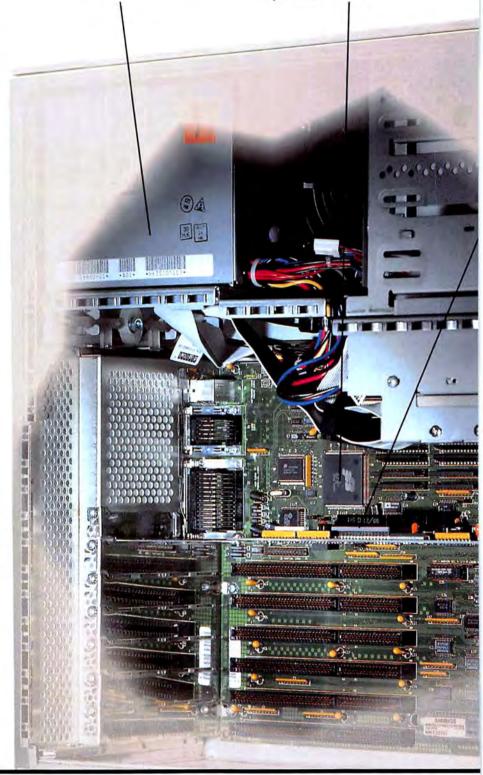


Autosensing 260W power supply

Ample power for options, with a very quiet variable speed fan.

Local bus video and GUI accelerator

Windows fly open. Applications switch instantly. If you're a pixel, it's the only way to fly.



Wait'll you climb into the-new 486-powered DEC



most exacting

international

standards.



Hold on to your hat. The DECpc™MT is priced like a clone, but it runs like a cyclone. The Windows performance will leave you breathless. The extra features and sleek footprint will floor you. Even the low price may make you a little dizzy. But only for a nanosecond.

"The MT 'towers' over PCs." — Infoworld, March 8,1993

Best of all, you can get the MT from the world's fastest growing PC source: Digital. With all the world-class services you'd expect — and more: a one year on-site warranty direct from Digital, supported by 35,000 people worldwide. Support for your PC, your software, your network, everything - whether or not you bought it from us. Support so good, in fact, that it won PC Magazine Reader's Choice Award.

The DECpc MT is one heck of a ride. And with our outstanding support, you always know exactly where you'll end up. So go ahead. Make the call. Then take it for a spin.

Each DECpc MT gives you:

- 6 ISA slots, 5 drive bays 127 MB hard drive
- 4 MB RAM GUI accelerator
- Local bus video



8:30 a.m. to 8:00 p.m. Mon.-Fri. ET Please reference BBG when you call

THE DECPC FAMILY. ONE BREATHTAKING VALUE AFTER ANOTHER.

LP SYSTEMS



Basic Features

- i486 processors
- 4 MB RAM, expandable to 64 MB
- 128 KB external cache memory, expandable to 256 KB
- local bus video and built-in GUI accelerator
- 512 KB VRAM, expandable to
- 127 MB IDE hard drive
- 3.5" 1 44 MB floppy disk drive
 3 available full ISA slots
- 14" SVGA low emission non-interlaced color monitor
- MS-DOS® 6.0 and Microsoft Windows™ 3.1 installed
- 2-button mouse
- 101-key keyboard
- Low-profile enclosure (3.5 x 16.1" x 15.6")

DECpc 425sx LP

25 MHz i486SX

\$1,649

DECpc 433sx LP

33 MHz i486SX

\$1,849

DECpc 433dx LP

33 MHz i486DX

\$2,099

DECpc 450d2 LP

50 MHz i486DX2

\$2,249

DECpc 466d2 LP

■ 66 MHz i486DX2

\$2,549

Lease for as low as \$74 a month.

France 1-69 87 69 87

Holland 030-832883

Australia 008-021246

Brazil 55-11-492-4195

MT SYSTEMS



Basic Features

- i486 processors
 4 MB RAM, expandable to 64 MB
- 128 KB external cache memory, expandable to 256 KB
- local bus video and built-in GUI accelerator
- 512 KB VRAM, expandable to 1 MB
 127 MB IDE hard drive
 3.5" 1.44 MB floppy disk drive

- 3 available front accessible 5.25" drive bays
- 6 available full ISA slots
- 14" SVGA low emission non-interlaced color monitor
- MS-DOS 6.0 and Microsoft Windows 3.1 installed
- 3-button mouse
- 101-key keyboard
- Compact micro-tower enclosure (17" x 7" x 17")

DECpc 433dx MT

33 MHz i486DX

\$2,349

DECpc 450d2 MT

50 MHz i486DX2

\$2,499

DECpc 466d2 MT

66 MHz i486DX2

\$2,799

Lease for as low as \$82 a month.



Germany 0130-7778

Canada 800-267-6215

Puerto Rico 809-781-0505 xt 8357

Asia 852-311-8321



SL NOTEBOOKS

Basic Features

- i386SL and i486SL processors
- Processor upgradable
- 120 MB removable hard drive
- 3.5° 1.44 MB floppy disk drive
- Upgradable LCD screens
- Snap-on trackball
- 2 Type II PCMCIA slots
 MS-DOS, Microsoft Windows, BitFax™/BitCom™ fax/modem software installed
- 6.5 hr. NiMH battery and autosensing AC adapter Optional Docking Port and
- Docking Station
- 80-key keyboard

DECpc 325SL

- 25 MHz i386SL
- 64 KB external cache
- 4 MB RAM expandable to 20 MB
- 9.5" 64-gray supertwist screen
 Size 8.5" x 11.5" x 1.8", 5.9 lb

\$2,299

DECpc 325SLC

- 25 MHz i386Sl
- 64 KB external cache
- 4 MB RAM expandable to 20 MB
- 9.5° 256-color passive matrix screen Size 8.5° x 11.5° x 2.1°, 6.9 lb
 - \$2,899

DECpc 425SLC

- 25 MHz i486SL
- 8 KB internal cache
- 4 MB RAM expandable to 32 MB
- 9.5" 64-gray supertwist screen
 Size 8.5" x 11.5" x 1.8", 6.2 lb

\$2,499

DECpc 425SLC Premium

- 25 MHz i486SL
- 8 KB internal cache
- 4 MB RAM expandable to 32 MB
- 9.5° 256-color active matrix screen
 Size 8.5° x 11.5° x 2.1°, 6.9 lb

\$3,999

Lease for as low as \$74 a month.

8:30 a.m. to 8:00 p.m. Mon-Fri. ET Please reference BBG when you call

PRINTERS



DECwriter 95

- 24-wire dot matrix
- High resolution at low cost (360 x 360 dpi)
- 13 resident fonts
- Upgrades to 7-color printing

\$319



DECmultiJET 2000

- Bubble ink jet technology
 HP™ Deskjet Plus Emulation
- High resolution (300 dpi)
- Sheet feeder built-in

\$499



DEClaser 1152

- Pos:Script Level 2 and HP PCL4
- 17 Adobe PostScript® fonts
- Multiple simultaneous active I/O ports
- 4 pages/minute

\$1,299

Take another 10% off these low prices!

Purchase any Digital desktop printer with your DECpc and receive 10% of the price of the printer. [Offer good through 7/3/93; not applicable to Resellers)

Japan 0120-116004 Venezuela 58-2-952-4011 Caribbean 305-360-6500

U.K. 0800-393200

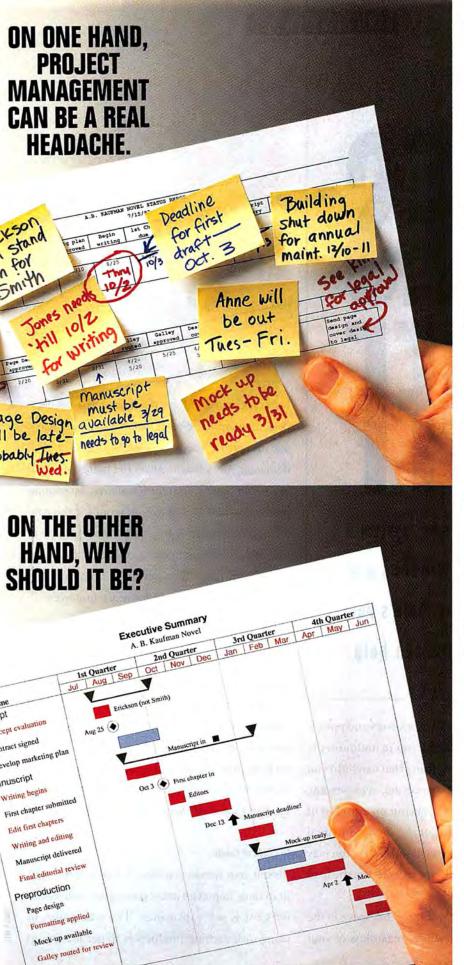
Italy 1678-02075

New Zealand 0800-800332

Mexico 52-5-669-0422



Digital Equipment Corporation, 1993. Digital, DECpc, DEClaser, DECmultijET, DECwriter, PATHWORKS, and the DIGITAL Logo are trademarks of Digital Equipment Corporation. HP is a registered trademark of Hewlett Packard Company. i386, i486, and the Intel Inside logo are trademarks of Intel Corporation. PostScript is a registered trademark of Adobe Systems, Inc. Windows is a trademark and MS-DOS is a registered trademark of Microsoft Corporation. Novell and NetWare are trademarks of Bristal believes that the intensition in this advertisement is accurate as of his publication date; such information is subject to change without notice. Digital is not responsible for any errors. Actual monitor may differ from those shown. Not all products available worldwide.





You work hard enough planning your projects; why not let Microsoft® Project 3.0 for Windows™ help you make it easier?

With clear graphs, you'll be able to see and communicate your project even better-from the tiny details to the big picture.

Changes? No problem. For every revision you make, Microsoft Project helps you see how it will affect the entire job.

Assigning a new job? Just click the People button. Want to know who's doing what, when? Microsoft Project can help you keep track of everyone.

And if you need to get off to a fast start, use PlanningWizards to guide you step by step. Soon, you'll have great-looking, easy-toread reports that make all your plans perfectly clear.

You can even exchange files between Microsoft Project on your PC and your Mac. Either way, why not plan on the leading project management software? Microsoft Project 3.0 – it takes the pain out of planning.



CACHES PAYOFF

BY TJ BYERS AND REX FARRANCE If your system's straining under the load of Windows and other disk-intensive applications, here's how hardware and software caches can help.

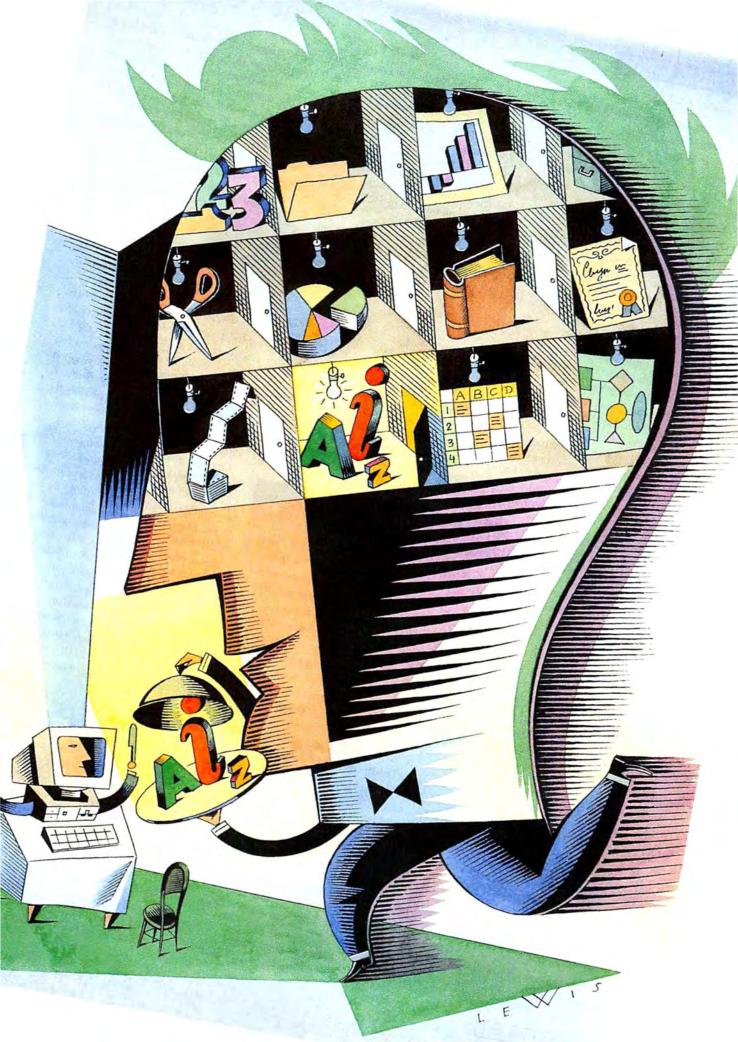
ith today's weighty workloads and powerhungry applications, you're undoubtedly searching for anything that can help you work faster. And chances are, overspending your budget for new PCs is not on your list of options. So how do you get the speed you need without shelling out thousands of dollars? You may find the key to next-level speed stored on the hard disk of your current PC.

Disk caching can make a huge difference in the speed of today's applications, regardless of your hard disk's age. And you don't have to use a database program to benefit; Windows, with its heavy use of virtual memory, makes big hard disk demands. Any system—even the hottest desktop iron—can benefit from disk caching. By reading more data than an application requests, the data the app subsequently requests is often already in the cache. Because getting the data from the cache is far faster than getting it from the disk, system and application performance improves.

But what's the best cache choice on the desktop: hardware or software? Is a costly caching IDE disk controller—which you have to install in an expansion slot in your PC—worth the investment? Or will a less expensive, easier-to-install software cache, such as *Super PC-Kwik*, do the job just as well? And what about SmartDrive 4.0, the caching utility that's free with *Windows 3.1* and DOS 6.0? How does it stack up against its hardware and software competition?

The Cost of Cache

To suit your needs, you have to find just the right fit in three important areas: cost, speed, and usability. Cost is self-explanatory. The whole idea in using disk caching products is to get maximum



HARD DISKS CACHES

bang for the buck—and the fewer bucks you need to spend, the better.

If you're looking for the lowest price you can find, The Aldridge Company's *Cache86* and HyperWare's shareware *HyperDisk* are priced at a mere \$50. Microsoft includes SmartDrive 4.0 with *Windows 3.1*, so you may already have it; you can get SmartDrive 4.1 for the cost of a DOS 6.0 upgrade.

The most expensive software products here are Central Point's PC Cache (included in PC Tools) and Symantec's NCache (included in The Norton Utilities). Both have list prices of \$179, but they also come with data protection, data recovery, file management, system information, and bench-

marking utilities that provide their underlying appeal. PC Tools throws in other extras, such as excellent antivirus and backup utilities, and a remote computing program.

Naturally you'll pay considerably higher prices for the hardware caching products. List prices run as high as \$595 for Perceptive Solutions' WinStore controller with its starting capability to cache 1MB of data, and as low as \$220 for UltraStor's Ultra 15C in its basic 512K configuration.

You should be able to find all these products discounted. For example, you can buy *The Norton Utilities* or *PC Tools* through mail-order software and hardware houses for around \$115 to \$125.

For a 4MB Windows PC, boosting system RAM to 8MB may provide more of a speedup than adding a 4MB caching controller.

Searching for Fast Cache

While costs vary considerably, the PC World Test Center detected minimal overall speed differences between hardware and software caches. Intriguingly, the software caches took a slim 4 percent edge. Why? For one thing, software caches use system

RAM instead of dedicated cache RAM plugged into an expansion slot, so cached information doesn't have to cross the I/O bus.

The difference in the speed of the products was similarly small, between 5 and 10 percent—which means it wouldn't be noticeable in everyday work. We tested IDE controllers because IDE drives are the cur-

rent desktop drives of choice, but control tests indicate that their results are consistent with those for ESDI and SCSI caching disk controllers.

It's important to note that our tests employed standard desktop applications. If you're using a non-DOS, non-Windows application such as Novell NetWare, a software disk cache may not work. For example, while all these software caches work on Novell client nodes, none support the Novell server. But many hardware caching disk controllers do, including the Alpha Research Model S4251 and UltraStor Ultra 15C listed here.

Our technicians used default installations on our 25-MHz 386DX Compaq Deskpro 3/25i for all the software products, on the assumption that most users would do the same. Our test system was equipped with 8MB of RAM. Hardware caching controllers were tested with 2.5MB to 4.5MB of cache, and with software from 256K to 7MB. We found that most of the benefit came with the first cache increments; each larger increment, while beneficial, offered an increasingly diminished performance benefit. For example, the speed difference between the same controllers using 2MB to 4MB of cache was a negligible 1 to 4 percent.

Cache Decisions

Remember that all caches use some kind of RAM. Hardware caches provide dedicated memory stores, and software caches borrow from system RAM. Generally speaking, a caching IDE controller will cost from \$150 to \$300 for the controller itself. Unless you have an older system or a system that requires proprietary RAM, these caching disk controllers and your system both use the same standard single in-line memory modules (SIMMs). So you'll pay a street price of \$30 to \$40 per megabyte to add RAM to either. And if you want to achieve an optimum performance boost, you'll probably need to add

Playing It Safe With Delayed Writes

Balways cache reads on cached disks. But they don't always cache their writes. In the write-through mode—the safer of the two—data is written to the disk immediately. The second mode, called delayed write, staged write, or write-back, postpones writing to the disk until there's no impending hard disk or CPU activity. Use of this mode can improve data throughput at the time of the write by as much as 30 percent, depending on the application.

Timing the Writes

Some caches, such as DOS's SmartDrive, constantly monitor system activity and write to the disk whenever an opportunity occurs. Others, like Fast, simply wait a predetermined time—five seconds, for example—in the hope that system activity will have subsided by the time the write is forced. Other products, such as Aldridge's Cache86, accomplish both of those tasks.

The danger in using delayed writes is that data has to reside in RAM during the wait, even though the cache has given the CPU the message that the data has been written. So the data is susceptible to loss should power fail. You can also lose information if the system is turned off or rebooted before the data is written to disk.

Most software caches attempt to avoid data loss by trapping the <Ctrl>-<Alt>-<Delete> keystroke sequence and flushing the buffers before a reboot. Some give you a hot-key option, and you can flush your cache with a keystroke combination—if you remember to use it. However, these features don't help you with a power failure or an accidental flick of the reset switch. And in a case where you have set up your hardware caching controller to use delayed writes, you don't even have a hot-key option for flushing the cache.

Caching software and hardware vendors argue that delayed writes actually lessen the amount of time your data is in jeopardy by speeding up your system overall. Whether or not you buy that argument, there's no question that if your data has not been written to disk and you lose power, you'll lose the data as well.

some RAM—especially if you have a system with only 2MB or so of RAM.

It's important to decide where the added RAM will do the most good. If you have a system with 4MB of RAM and you're a Windows user who runs multiple applications and does a lot of task switching and background processing, boosting system RAM to 8MB will provide much more of a speedup than adding a 4MB caching disk controller. And you won't have to pay an extra \$200 or more for the controller card. It is important to note, however, that older, slower machines will benefit much more from hardware than software caching for two reasons: The CPU is slower, and in PC-XT class and earlier systems specifically, your total RAM is too limited to leave enough space to cache in. Of course, with many of these older systems, the cost of a hardware caching controller may exceed the value of the PC.

Cache Usability

Usability is essential with any product, and it starts with an easy installation and setup, which an installation program should facilitate. Everyday usability features are even more important. Many software caches offer hot-key options that let you enable and disable the cache with a keystroke, switch performance-enhancing delayed writes on or off, or flush out the cache to make sure all the data is written to disk before shutting down. The latter can be important if you're using a cache with delayed writes enabled. (For more details see the sidebar, "Playing It Safe With Delayed Writes.")

Installing a caching disk controller requires some work. For starters, you have to open the PC's cover and plug the card into an expansion slot on the system board. Usually you have to run the computer's setup program to disable the PC's built-in IDE connector. Then you have to select the correct drive type to correspond to your controller. You attach the drive cables, set a jumper or two, and away you go. It's not really difficult, but the process can be intimidating for the less technically inclined.

Software installations are a snap. Usually all you have to do is run an installation program, which transfers the program from floppies to the hard disk. Ideally, the program should allow you to adjust your CONFIG.SYS and AUTOEXEC.BAT

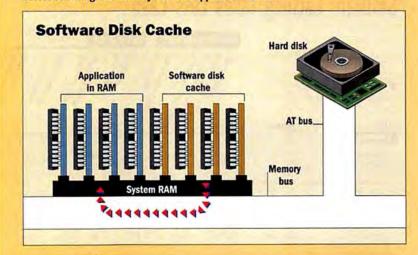
start-up files. If your program doesn't complete the whole job, you will have to use an ASCII editor and make the final adjustments yourself. This isn't terribly challenging, but it can be an annoyance. The best installation utilities are menu-driven, giving you the opportunity to set caching parameters during installation.

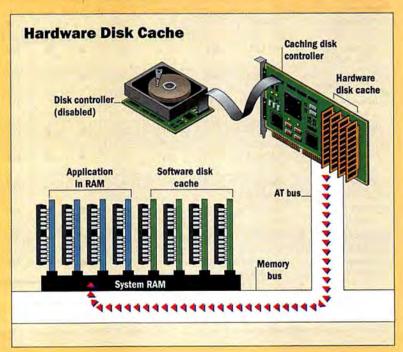
The easiest program to install is Lucid's

Lightning for Windows. It has an accessible menu interface, and it's smart enough to default to the right choices in most cases. The only thing it doesn't do by itself is adjust the number of DOS buffers. All the software caches advise you to reduce the number of DOS buffers in the CONFIG.SYS file to ten or less, but only two, Flash from Software Matters and Golden

Software and Hardware Cache Hits

The software disk cache (top) uses system RAM for caching. When requested data is in the cache (a hit), it traverses only the memory bus to get to application RAM. The hardware cache (bottom) has its own dedicated cache RAM, but delivering a cache hit takes a bit longer because the data must travel on the slower AT bus before reaching the memory bus and application RAM.





HARD DISKS CACHES

Bow's *Veache*, actually do it. The others force you to edit the file manually.

Unfortunately, neither *Flash* nor *Veache* deletes existing software caches; having two running at the same time noticeably reduces system speed, and if you've installed *Windows*, you probably already have SmartDrive running. An advantage of caching disk controllers is that they do not need to delete software caches.

The most difficult software cache to install is The Aldridge Company's *Cache86*. It's the only one we found that lacks an installation program. Besides having to install the cache manually, you need com-

plete firsthand knowledge of the system's environment, as there are no defaults.

Cache Considerations

As you can see, each class of products provides benefits and drawbacks. Software caches are a hair faster, a lot cheaper, and can cache more drives. Hardware caches are generally better behaved and support more applications and operating systems.

What's more, hardware caches don't eat up conventional RAM; the Alpha Research and Corporate Systems Center cards require just 1K; the Perceptive Solutions and UltraStor products use none. The IDE disk controller cards we looked at plug into 16-bit ISA expansion slots and use standard SIMMs to provide most of their cache capacity, although the two Perceptive Solutions controllers also have 512K of cache RAM soldered on.

Most of the software products can cache a variety of drive types in addition to ESDI, IDE, MFM, RLL, and SCSI Winchester drives. They will cache floppy drives and a range of SCSI removable-media drives, including those of hard disks, magneto-optical hard disks, and CD ROM drives. Software products cache instructions and data in extended RAM above 1MB but often

Software Caching Takes Less Cash

		STANDA	RD FEATURES	INSTALL	ATION				HOT-KEY	S			SUPPORTED
■ = Yes ○ = No n/a = not applicable	Product	system RAM) Price	cache size (installed cache size (oftware con software con software con software cache are with software cache size (installed software con software constitution sof	program (MB)	software Co	RAM require RAM require	RAM Size	RAM type Ramixes system	cache cache	write delay	Flushing Mite-through	of drives	
HARDWARE									100000				
Alpha Research 512/836-0709	Model S425I	\$289	none ²	16	•	n/a	1K	n/a	n/a	0	•	0	4
Corporate Systems Center 408/737-7312	FastCache 64	\$149	1MB	64	•	n/a	1K	n/a	n/a	0	0	0	6
Perceptive Solutions 800/486-3278	QuickCache WinStore	\$395 \$595 ⁶	512K 512K ⁷	8.5 8.5 ⁷	•	n/a n/a	none none	n/a n/a	n/a n/a	0	0	0	4 4
UltraStor 714/581-4100	Ultra 15C	\$220	512K	8	•	n/a	none	n/a	n/a	0	0	0	4
OFTWARE	37			0.000				1907.00	100	- TOWN	100	V 34.5	
The Aldridge Co. 800/548-5019	Cache86	\$50	попе	88	0	0	13K	0	0	•	•	•	24
Bloc Publishing 305/445-0903	Fast 4.13	\$80	25% of RAM	88	•	•	26K	0	0	•	•	•	24
Central Point Software 800/445-4208	PC Tools 8.0 PC Cache	\$179	256K	32	•	0	17K	•	•	0	0	•	26
Golden Bow Systems 800/284-3269	Vcache 6.00	\$70	avail. ext. or exp. RAM	8	•	0	37K	•	0	0	0	0	16
HyperWare 415/882-1740	HyperDisk 4.50	\$50	avail. ext. or exp. RAM	63	•	•	29K	•	•	•	•	•	209
Eucld 800/967-5550	Lightning for Windows	\$130	ЗМВ	8	•	•	90K	•	•	•	•	•	26
Microsoft 206/882-8080	Windows 3.1 SmartDrive 4.01	\$130	2MB	32	•	0	26K	•	0	0	Ò	0	26
PC-Kwik 503/644-5644	Super PC-Kwik 5.01	\$80	avail. ext. or exp. RAM	16	•	•	48K	•	•	0	•	0	26
Software Matters 317/253-8088	Flash 9.0	\$70	avail. ext. or exp. RAM	32	•	•	4K	•	•	•	•	•	26
Symantec 800/441-7230	Norton Utilities 6.01 NCache	\$179	avail. ext. or exp. RAM	23	•	•	33K	•	•	0	0	0	26

¹ Software conventional RAM requirements vary with cache size.

² Sold without memory; needs 1MB to function.

³ Controller support only, not cached.

⁴ Can select inactive CPU or time-delayed write at setup.

⁵ When Hot-Fix feature is enabled.

⁶ Includes Stac hardware real-time data compression (approximately doubles size of hard drive and cache space). Software version available for \$100 less.

⁷ Caches twice as much compressed data.

^{8 8}MB maximum for extended memory, 4MB maximum for expanded memory.

⁹ Supports 10 hard and 10 floppy drives.

require conventional RAM in their default configurations. Lucid's Lightning for Windows takes a hefty 90K. You can usually load the drivers in upper memory, but if you also have network or CD ROM drive drivers to contend with, you may be out of upper memory. In that case, the bite will come from your 640K of conventional RAM. That adds up to problems executing RAM-hungry applications.

It's also important to realize that software caches don't always work with every application. For example, many software cache vendors warn against use with Quarterdeck's QEMM-386 memory manager in its popular

Stealth mode. And certain caches, such as Aldridge's Cache86, Bloc's Fast, and The Norton Utilities 6.01's NCache, warn against use with AddStor's real-time disk compression utility SuperStor. (Norton Utilities 7.0's cache, which will be available by the time you read this, is compatible with SuperStor, Stac Electronics' Stacker; and DOS 6.0's DoubleSpace data compression program.)

Hardware caching controllers, on the other hand, rarely conflict with software programs. One IDE caching controller, Win-Store from Perceptive Solutions, even comes with Stac's hardware data compression integrated on the controller.

INCLUDED UTILITIES **DELAYED WRITES** 01 625 0 0 0 0 0 0 0 0 626 627 627 0 628 0 629 0 . 0 . 630 . . . 631 . 0 . . 0 632 633 635 0 0 0 . . . 636 637 638

¹⁰ DOS 6.0 includes a later version of SmartDrive.

For more information about all products in this table, circle reader service no. 901.

Picking Your Winner

For most desktop users, a software cache is the best choice, primarily because of the price advantage and easy installation. SmartDrive comes free with DOS and Windows, it's fast, and if you're like most users, it's all you'll ever need. But its installation does leave something to be desired: Windows and DOS 6.0 install it automatically but don't offer guidance on choosing a configuration. (A rough rule of thumb for users with 4MB of RAM is to set up a 1MB cache; if you have 8MB, SmartDrive 4.0's default 2MB cache should be fine.) Windows users with high memory to spare will like Lightning for Windows. It's easy to install and has an excellent toolbox of incidental Windows utilities. Super PC-Kwik 5.01 is a tried-and-true program with a devoted following, a reputation for compatibility, and an easy installation. You can also buy it with Super PC-Kwik Power Pak 3.0 for a nominal additional fee and get a number of extra utilities, such as keyboard and DOS screen accelerators and a print spooler.

Any of the caching disk controllers here can make a good alternative, especially if you have to run applications that need lots of RAM and your system is burdened with device drivers. If you're using a utility that software caches can't handle, a hardware solution may be your only disk-caching choice. The CSC Fastcache 64 is the least expensive of the lot. The Alpha Research S425I and UltraStor Ultra 15C are the only ones that will run on a Novell NetWare file server. If price isn't a big concern, Perceptive Solutions' WinStore board provides efficient disk caching and can nearly double your storage and disk cache capacity with its hardware real-time data compression.

While there is no universal answer, disk caching can pay off for almost every desk-top user. Apart from exceptions dictated by occasional compatibility problems and unusually RAM-hungry applications, software caches are the most attractive solution. Bottom line? You probably already have one of the best disk caches you can get your hands on—SmartDrive. Just make sure you have it installed and configured properly.

TJ Byers is a contributing editor and Rex Farrance an associate editor for PC World. They can be reached as TJBYERS and REX-FARRANC on PC World Online (see page 10 for more information).

E_{Lots} Make ^ Money

We Make Lots of Software!

"DESIGNCAD ... IS A CASE STUDY OF WHAT CAN be ACHIEVED WHEN A SOFTWARE PRODUCER COMMITS TO EXCELLENCE. A GREAT INTERFACE, logical commands, and vertical INTEGRATION INTO 3D COMBINE WITH A GREAT DRICE (\$349) TO MAKE...A SUPERIOR DUY ONCE AGAIN." - PC MAGAZINE MARCH 1993.

FILES BIT IMES BC/CIRC MOCKES

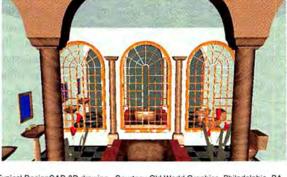
amazing amount of CAD power for the low price. Features such as a built-in programming language and an on-line manual are standard. Distance, bearing, and center-of-gravity measurements are just a few of the advanced calculation capabilities available. DesignCAD 2D is not a low performance CAD system. It's only low priced!

Who Uses DesignCAD?

ocons Studies indicate the average DesignCAD purchaser is a Fortune 1000 company with more than 500 employees and 100 million dollars per year in total sales. However, due to the low price, a large number of DesignCADs are sold to "average"

ordinary projects.

DesignCAD gives you the power and sophistication to complete any type of project



Typical DesignCAD 3D drawing. Courtesy Old World Graphics, Philadelphia, PA. computer users for

DesignCAD Release 6.0 added hundreds of new features and improvements. For this reason, our dealers and distributors felt a price increase was in order. Some complained they made more money selling competing products. It's always been our belief that a computeraided-design (CAD) system shouldn't cost more than a good word processor. In the finest American Tradition we said, "Aw...What the Heck. Let's see the other guys beat our deal! Let's keep the price low, and sell big quantities."

DesignCAD 2D Still \$349 suggested asking price

DesignCAD 2D Release 6 offers an

What Can You Do With DesignCAD?

Anything! Design your own home, porch, or room addition. Landscape your home. Create technical drawings,

do cross-stitch needlework patterns, stain glass window designs, model airplane designs, futuristic vehicles, or design small thermonuclear devices (not a recommended use). Design real-life space vehicles, such as the

space shuttle. Do all types of space management and facilities designs. DesignCAD eliminates the age-old drafting board.

The uses for DesignCAD 2D are only limited by YOUR imagination!

What about 3D?

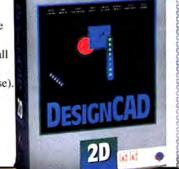
We've got it! We offer DesignCAD 3D for only \$499. DesignCAD 3D offers power and features not found on systems costing thousands of dollars more.

Which Do I Buy?

In general, DesignCAD 2D is the best choice for all drafting applications. DesignCAD 3D is best used for simulation; to see what something looks like before it's built. If you have questions about which program is best suited to your needs contact our Sales Department.

Do You Offer a Bundle?

Yes, we offer DesignCAD-The Professional Series. This package combines DesignCAD 2D, DesignCAD 3D. ScanPro Raster-to-Vector conversion software, and 6700 symbols all in one complete package. For the name of your nearest dealer or for information and a FREE demo disk, fax or call the numbers below.





Tel: (918) 825-4844 Fax: (918) 825-6359

American Small Business Computers, Inc. One American Way Pryor, OK 74361 USA

American Small Business Computers, Europe 75016 Paris FRANCE TEL: 331 4520 6540 • FAX: 331 4520 6539

Circle 1 on reader service card



IT'S NOT HOW MUCH YOU READ.

You can read a knee-high stack of computer magazines each month and still not find the depth and breadth of news and information you'll discover each week in the pages of *Computerworld*. As the only weekly newspaper for IS professionals, *Computerworld* is filled with up-to-the-minute articles on topics ranging from products and people to trends and technology. We cover it all—PCs, workstations, mainframes, client/server computing, networking, communications, open systems, languages, industry news, and more.

It's everything you need to know to get an edge on the competition.

No wonder over 138,000 IS professionals pay to subscribe to *Computerworld* every week. And so should you.

That's why we're making a special offer to *PC World* readers who've never subscribed to *Computerworld* before.



IT'S WHAT YOU READ.

Order a trial subscription today, and we'll send you 6 complimentary issues. If you like *Computerworld*, pay just \$29.95 for 45 more issues (51 in all). If you choose not to subscribe, simply write cancel on the invoice and return it to us. You owe nothing. The trial issues are yours to keep.

Call us toll-free at **1-800-343-6474**. Or use the postage-paid subscription card bound into this issue. And get your own copy of *Computerworld*.

Then you can spend less time reading about the world of information systems. And more time conquering it.



The Newspaper of IS

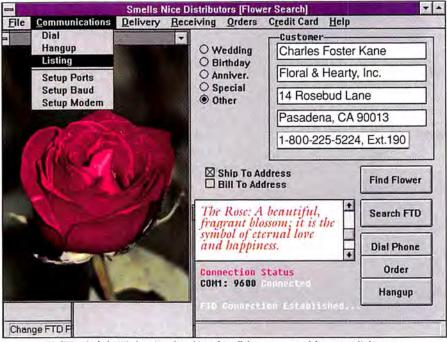


true: new CA-dBFast 2.0, the first and only dBASE-compatible database and language for Windows.

CA-dBFast meets two giant needs: moving existing dBASE applications to Windows and developing dazzling new applications in record time. It's the one solution that lets you take advantage of Windows while protecting the huge investment you've made in Xbase technology.

With CA-dBFast 2.0, you get a proven, stable environment that's more visual and more intuitive than anything you've ever used. And there's no need for Microsoft's confusing, intimidating SDK, so creating applications with CA-dBFast is - true to its

name - fast.



CA-dBFast includes Windows interface objects for pull-down menus, push buttons, radio buttons, check boxes, scrolling list boxes, bit-mapped graphics and more.

debugger that's so advanced it lets you watch your source code execute at run time - even Single Step through execution.



CA-dBFast's report writer, CA-RET, lets you mix text, graphics and data to produce great-looking reports in minutes.

The Visual Application Designer (VAD) makes creating pull-down menus, push buttons, radio buttons, check boxes,

OMPUTERWORLD



scrolling list boxes and other Windows objects as easy as "point and click" or "drag and drop." The VAD generates

the required source code, saving you hours of complex programming. You also get a

CA-dBFast 2.0 also includes CA-RETan outstanding Windows-based report writer that lets you mix text, graphics and data on the same report in a full WYSIWYG environment.

Creating great-looking tabular reports, form letters and labels is as easy as using a word processor.

FOR A FREE DEMO DISK, CALL 1-800 CALL CAI, Ext. 190.

With CA-dBFast applications, there are no license fees, royalties or key diskettes to bother with. And recipients of runtime programs don't need CA-

dBFast to run the application - just Windows. CA-dBFast is also compatible with CA-CLIP-PER, dBASE III Plus, dBASE IV. and FoxBASE.

So whether you want to wake up old applications or build brilliant new ones, there's only one way to marry Windows beauty and Xbase power.

Check out CA-dBFast today.



How To Manage The Future.

The Ultimate Combination Of Power And Ease-Of-Use. Now Available For Both Windows *And* OS/2.



Introducing the first project manager your entire company can use.

For power users, there are dozens of new fea-

tures, functions and an internal development language that makes creating advanced macros quick

and easy.

For beginners, the easiest, friendliest interface and shortest learning curve in the industry. IICROSOFT. VINDOWS. OMPATIBLE

Buy one version,

get the other FREE.

The new graphics and reporting options will make every user look like a

genius. And since it runs under Windows and OS/2, you won't be burning

any bridges.



FOR A FREE DEMO DISK CALL 1-800 CALL CAI EXT. 240.

Call today to test-drive the awardwining project management

software that can help you manage the future.

Today.



New CA-SuperProject 3.0.

© 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

Outrageous Upgrade.

New Competitive Upgrade Can Save dBASE, FoxPro, Paradox, Access And ARAGO Users Up To \$1,291!

\$199 Includes Your Choice Of Any One Of These Absolutely FREE! Offer Good For Users Of Any Competitive DBMS – Call Today!



Over 550 time saving, problem-solving functions in one high-performance package. Raise your productivity with this valuable library.



Compile almost any dBASE IV application in three easy steps—and produce executable (EXE) files with the efficiency of CA-Clipper.



dBASE apps come alive with new CA-dBFast 2.0 - the first dBASE-compatible database and language for Windows.

The Complete, Professional Programming Environment.

The Premier Application

CA-Clipper® 5.2 is a robust language, an efficient linker, a flexible preprocessor and a high-performance compiler. It includes: an editor, debugger and make utility for creating PC and LAN-based applications.

Faster Access, Faster Screen Writes, Faster Performance.

Address up to 32 megabytes of virtual mem-

Feature	CA-Clipper	FoxPro	dBASET
Lexical Variable Scoping	YES	NO	NO
User-defined Commands	YES	NO	NO
Code Blocks	YES	NO	NO
Nested Multidimensional Arrays	YES	NO	NO.
Predeficed Object Classes	YES	NO	NO
Variables Modifiable in Debugger	YES	NO	NO
Customizable Reactive Error Handling	YES	NO	NO.
Reads and Writes FoxPro (:CDX) Files	YES	YE5	NO
Reads and Writes dBASE IV (MDX) Files	YES	NO	YES
Reads and Writes Paradox (DB/.PX) Files	YES	NO	NO

Comparison based on FoxPro Version 2.5 for DOS and dBASE IV Version 1.5

ory — with shorter access times. New Expanded Memory System (EMS) capabilities including LIM 4.0 support, plus a Virtual Memory Manager that uses dynamic overlays to let you exceed available RAM.

New RDDs For FoxPro, Paradox and dBASE IV.

Replaceable database drivers for all the most popular development systems. Plus you can customize Clipper with user-defined commands and functions. And seamlessly









DBMS Reader's Ch winner for client/s er development sys

integrate modules from languages such as C, Assembly, dBASE and Pascal. There are no runtime fees, no additional licenses, no LanPaks.

So what are you waiting for?

Call right now and upgrade to the new standard in Xbase development.

Software superior by design.

SEE YOUR LOCAL DEALER TODAY OR CALL 1-800 CALL CAI EXT. 176.

Operators are standing by to take your order. Offer good for a limited time only, so don't wait. Call today!

New CA-Clipper 5.2.

The information service that's more than a retriever. It's your own personal bloodhound.

Just \$29.95 gets you started and

includes three free hours.*

For more information, call

1-800-522-3567, Ext. 295.

Dow Jones News/Retrieval is not only loyal, it's extraordinarily obedient. Not only will it fetch

facts for you, but all on its own it will relentlessly - and continuously-track down exactly the news and information you need.

The way it works is simple. With just a few keystrokes, you can set up separate electronic

folders for the topics you want to be kept current on. Then News/Retrieval will automatically search through a multitude of Dow Jones news sources. And feed your electronic folders a steady stream of timely, preselected news, which you can read

So you can spend your time actually using the information, instead of gathering it.

Up-to-the-second information that's drawn from our proprietary newswires, including the Dow Jones News Service and the Capital Markets Report, plus PR Newswire, BusinessWire and the full text of The Wall Street Journal.

As well as hundreds of local, regional and national business publications.

In addition to the news, you'll also have access to a wealth of historical business and financial data.

To send News/Retrieval chasing after the news you need, simply call our toll-free number.

at your convenience. All of it gathered while Dow Jones News/Retrieval® vou're attending a meeting The lifeblood of business.™ or writing a report.

One-time offer to new U.S. members only Free time is per account and must be used within 30 days after receipt of password. Certain data bases have charges in addition to usage fees, which are excluded from the free-time offer. Dow Jones News/Ferticeal and Dow Jones News/Ferticeal and Dow Jones & Company, Inc. All Rights Reserved.

© 1992 Dow Jones & Company, Inc. All Rights Reserved.

Here's How

Contents: Spreadsheets 224 | Word Processing 230 | Windows 236 |

HELP LINE Q & A



TIP OF THE MONTH

TERMINAL AUTO-DIALING: Windows can use your modem to dial the phone for you. Select Program Manager's StartUp group. Press <a href="Alto-FN<Enter">Alto-FN<Enter Tab, type PROGMAN-.EXE, enter an unused shortcut key (we'll use Z), and press <Enter>. In Accessories, click on Terminal, press <alt><Enter>, enter T for the shortcut key, and press <Enter>. Run Terminal. Select Settings • Communications, your modem's COM port, its baud rate, and OK. Select Settings . Modem Commands, and after ATDT, add the number, if any, for an outside line and a comma. Save the file as Dial, and exit. Highlight a phone number in an app. Run Accessories' Recorder, and select Macro • Record. Type Autodial, press < Tab>D, and ensure only Ctrl is checked. From the Playback To list, select Any Application and ensure only Enable Shortcut Keys is checked. From the Record Mouse list, select Ignore Mouse. Select Start, Switch back to the app. Press <Alt>EC<Ctrl>-<Alt>-Z<Ctrl>-<Alt>-T<Alt>-FODial <Enter><Alt>SN<Ctrl>-V<Enter><Alt>PD. Click Cancel. Switch to Recorder. Save the macro. In Recorder, select Macro . Record, type Hang up, press <Tab>H, and select Start. In Terminal, press <Esc><Alt>FXN. In Recorder, save the macro. In Recorder, save the macro file as DIAL.REC. Now, whenever DIAL.REC is open, you can highlight a number in a Windows app and press <Ctrl>-D to dial it. When your party's phone rings, pick up your phone and press < Ctrl>-H.

Shane Rau, assistant technical editor

Print Screen Problem

I have to press <Print Screen> three times before my HP LaserJet prints. Then it prints two-and-a-half screens, and I have to take it off line to clear it. Is there some way to make <Print Screen> print on the first press? Gerard L. Caron, Lynn, Massachusetts

When you press <Print Screen>, it dumps what's on the screen to your LaserJet's memory. However, since the screen dump is only 25 lines long, and the Print Screen ROM routine doesn't send an "eject page" command, the LaserJet assumes there's more text on the way. When you press <Print Screen> again, the LaserJet still doesn't have a full page in memory, so it still doesn't print. When you press <Print Screen> the third time, the LaserJet prints out what will fit on one page, leaving part of the third screen in memory to be printed on the next page.

To avoid this problem, you can press <Print Screen> once, then eject the page manually: Press the On Line button to take the printer off line, press the Form Feed button to eject the page, and press the On Line button again to put the printer back on line.

Another solution is the shareware utility *LJVGA*. This utility eliminates fiddling with the printer's buttons; you just press <Print Screen> once, and the LaserJet prints whatever is on screen. *LJVGA* can even produce super-VGA graphics at 300-dpi resolution (DOS's GRAPHICS utility prints 150 dpi) and works with DOS programs running under *Windows*. You can download *LJVGA* from PC World Online or order it by phone from the distributor.

LJVGA \$24 (\$14 registration only);
 Ares Technologies; 800/242-4775,
 713/524-6394, 713/524-6398 (fax)
 Reader service no. 620

Which On-line Service?

I am considering joining an on-line service but am confused about the options. You refer to America Online throughout the magazine, but you sometimes mention CompuServe as well. I also have a trial membership in Prodigy. Which service will give me the best access to *PC World?*

Martin P. Feinberg, Pittsford, New York

Currently, your broadest access to the magazine is through the PC World Online area of America Online. There, you can ask questions of Here's How columnists, report subscription problems, and submit your comments to the Letters column. Though you can often download the shareware and freeware files mentioned in PC World articles from other on-line services or local BBS's, the easiest place to find the files is in each issue's Featured in folder on PC World Online. One other on-line service with a major PC World presence is MCI Mail, where most editors have personal E-mail accounts.

XCOPY from A: to A:?

My new 486 came with a single 3½-inch floppy drive. Because many of my clients still use 5½-inch disks, I installed a 5½-inch B; drive. The new

Data Management 240 | Publishing & Presentations 244 | Communications 248 | Hardware 250 | Star-Dot-Star 254

drive works great, but I can no longer XCOPY directly from one 3½-inch floppy to another. Is there some way I can get that capability back?

Elizabeth Edwards, Brattleboro, Vermont

DOS's DRIVER.SYS lets you assign multiple drive letters to floppy drives. Add the line DEVICE=C:\DOS\
DRIVER.SYS /D:0 /F:7 to your CONFIG-.SYS and reboot.

The /D:0 switch indicates drive A:, and /F:7 tells DOS it's a 1.44MB drive. (If you have a 2.88MB drive, use /F:9 instead.) DOS will assign the drive both A: and the next available drive letter—if you have only two floppies and a C: drive, your phantom 3½-inch floppy will be drive D:.

If you have more than one hard drive, have partitioned your drive into multiple logical volumes, or have installed CD ROM or other drives that use their own CONFIG.SYS drivers, watch the display when DRIVER.SYS is loaded to see which additional drive letter it assigns to the floppy drive. (The message is 'Loaded External Disk Driver for Drive x'.)

Now XCOPY A:\ D:\ will work the way XCOPY A:\ B:\ did before you installed the second floppy drive. If you'd like to have the same capability with the 5½-inch drive, also add the line DE-VICE=C:\DOS\DRIVER.SYS /D:1 /F:1 to CONFIG.SYS. The /D:1 indicates drive B:, and /F:1 tells DOS it's a 1.2MB drive. Assuming the first floppy's double was D:, this one's will be E:.

Overlapping Commands

After I log into my lab's network, I can no longer access DOS's on-line help display—entering HELP brings up NetWare's interactive help system instead. How do I get DOS help while running NetWare?

S. Chandrasekaran, via Internet

A If you need to get help on a specific command, you can always use the /? switch. For example, typing UNDELETE /? displays help for the UNDELETE command.

More generally, when you have two or more commands with the same name in various directories, you can specify the one you want by typing its complete path. For example, if your DOS directory is C:\DOS\ enter C:\DOS\ HELP and you'll get the familiar list of DOS commands rather than NetWare's on-line help.

You can also use batch files to provide unique names for commands with conflicting names. For example, if you put the command @C:\DOS\HELP %1 in a text file and save it as C:\DOS\DOSHELP.BAT, you'll be able to invoke DOS's HELP command using the command DOSHELP.

Easing Network RAM-Cram

I currently run DOS 5.0 with Windows 3.1, and my system is connected to a NetWare LAN and a minicomputer simultaneously. Even though I put everything I can into upper memory, by the time I load all the drivers I need, I have only 430K of memory left—not enough to load some of my apps. Is there a way to load some drivers into extended or high memory?

Glenn Gardner, via Internet

A Unfortunately, your drivers have to be loaded in conventional (base) or upper memory (UMA). One possible exception is NetWare's EMSNETX-EXE driver, a NETX.EXE replacement that loads most of its code in expanded memory (EMS). However, if you don't need EMS for other purposes, switching to EMSNETX will be a net loss, because configuring DOS to emulate expanded memory on a 386 or 486 uses 64K of upper memory, the same memory EMM386.EXE uses to load drivers high.

If you don't use EMS, add the parameter NOEMS to the end of the CON-FIG.SYS entry for EMM386 (and remove the parameter RAM, if it's there), and you'll have 64K more upper memory for drivers and TSRs.

USER GROUP OF THE MONTH

Greater Cleveland PC Users Group

The June user group tips come from the Greater Cleveland PC Users Group, which meets on the first Saturday morning of the month. The club includes special interest groups for beginners, women, and users of spreadsheets, word processors, databases, Windows, and OS/2.

The club's BBS has over 30 phone lines and gives members access to 6GB of files and 3000 conferences. Its shareware library, which includes a videotape library and a book exchange, is available at the monthly meeting. GCPCUG publishes a monthly newsletter with tips and tricks, reviews, and a complete calendar of computing events in northeast Ohio. For more information about the Greater Cleveland PC Users Group, contact Dan Hanson at 3150 Payne Ave., Cleveland, OH 44114, or call 216/781-4132. Yearly membership is \$25.

Reader service no. 621

A NOTEBOOK FOR EVERY PRINTER: The point of having a notebook is taking it from place to place, but it's unlikely that the printers at your home, office, and client site are compatible.

You'll save some formatting headaches if you keep several printer drivers, both for Windows and your DOS applications, installed on your notebook. You'll obviously want drivers for your office and home printers, but drivers for Post-Script, a PCL printer such as the HP LaserJet Series II, and a dot matrix printer such as the Epson FX-80 will also come in handy if you'll be printing from a variety of locations.

Dan Hanson Greater Cleveland PC Users Group



Novell's XMSNETX.EXE, which loads itself into the high memory area (HMA, the first 64K of extended memory), won't do you any good. You'll save more base memory by loading DOS into the HMA instead, if you add the line DOS=HIGH,UMB to your CONFIG. SYS file.

You may be able to load more drivers high (into upper memory blocks) by configuring EMM386 to provide more upper memory. To see if that's possible, exit Windows, enter MSD at the DOS prompt, and select Memory. Take a look at FIGURE 1. The "before" display on the left side is MSD's display of my UMA when CONFIG.SYS contains the line 'DEVICE=C:\WINDOWS\EMM386-EXE RAM 128'.

Since MSD indicated the 64K range E000-EFFF was 'possibly available', 1 modified my EMM386 line to DE-VICE=C:\WINDOWS\EMM386.EX E /NOHI RAM 128 I=E000-EFFF and rebooted. (By default, EMM386 uses addresses from segment C800 to DFFF only; you must use the I= parameter to make EMM386 use other addresses.) As you can see in the "after" display on Figure 1's right side, that change gave me another 64K of usable upper memory. Note that although MSD doesn't display it, you can often make another 32K of upper memory available by adding I=B000-B7FF as well. However,

some super-VGA boards (like my Orchid ProDesigner IIs) use part or all of that range, so check your video board manual before making the change.

/NOHI forces EMM386 to load itself entirely into conventional memory, freeing the 4K identified as 'RAM' in the "before" display and making room for a 16K program where only 12K would have fit before. This has no practical benefit in my system, but in your situation it might let you load one more driver high. And don't forget, if you don't need EMS, replacing the parameter RAM with NOEMS will turn all blocks marked 'EMS Page Frame' into 'Free UMBs'.

If MSD still shows 'Free UMBs' after you load all your drivers and TSRs, try experimenting with loading them in different orders. If after all this fiddling you still don't have enough free conventional memory to run your applications, get out your checkbook and buy a copy of 386Max or QEMM-386. These third-party memory managers use various software tricks to grab more upper memory and squeeze more stuff into it than DOS can.

 386Max \$99.95; Qualitas, Inc.;
 800/733-1377, 301/907-6700, 301/907-0905 (fax)

Reader service no. 622

QEMM-386 \$99.95; Quarterdeck
 Office Systems Inc.; 800/354-3222,

310/392-9851, 310/399-3802 (fax) Reader service no. 623

XMS = Extended?

When I run the DOS command MEM, it says I have 7340032 bytes of extended memory but zero bytes of available extended memory. Instead of available extended memory, MEM says I've 4972544 bytes of available XMS memory. What's the difference? Chris Pauling, via fax

The display of DOS 5.0's MEM command is a bit confusing, 'Total contiguous extended memory' shows how much extended memory DOS detects in your system-usually the total amount of physical RAM, minus IMB. (In some systems, DOS may not recognize memory beyond 16MB, and the total can also be affected by RAM shadowing and other system-specific memory features.) 'Available contiguous extended memory' shows how much of that extended memory is available to programs that are written to manipulate it directly using DOS's interrupt 15h interface.

When DOS's extended memory manager, HIMEM.SYS, is activated (via the line DEVICE=HIMEM.SYS in your CONFIG.SYS file), it takes over all extended memory, so the amount of 'available contiguous extended memory' drops to zero. That memory is still available to your programs—the only difference is that they have to request it from HIMEM.SYS instead of directly from DOS.

MEM's 'available XMS memory' display shows how much of the extended memory HIMEM is managing remains available for use by other programs. These days, most programs access extended memory through XMS rather than interrupt 15h, so 'available XMS memory' is the only figure most people need to worry about.

If you upgrade to DOS 6.0, you'll leave this confusion behind. The upgrade's new MEM display is a big improvement—even though it gives you more information, it's much easier to read and understand.

By Robert Lauriston

Robert Lauriston is a freelance writer and a regular contributor to PC World.

Mail your questions to Help Line, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to the Help Line forum on PC World Online; CompuServe 74055,412; MCI Mail 179-3813; Internet 1793813-@mcimail.com; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

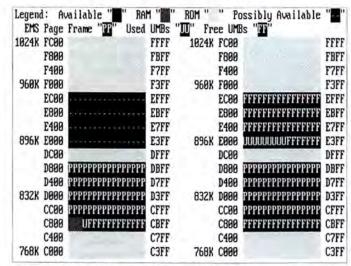
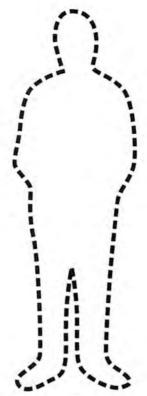


FIGURE 1: MODIFYING YOUR CONFIG.SYS'S EMM386 command can make more upper memory available for use by DEVICEHIGH and LOADHIGH. This "before" (left) and "after" (right) composite of two MSD upper memory displays shows the effect of adding the parameters /NOHI and I=E000-EFFF.



In Your Quest To Upgrade Technology, Don't Overlook The Most Important Upgrade Of All

research has shown that just one day

increase user productivity 30%. And

at a fraction of the cost of your tech-

of our instructor-led training can

You've invested a bundle in personal computer hardware and software, thinking it would pay off in higher productivity. But has it?

> By the end of the '80s technology boom, productivity in American business was up less than 2%.

A pretty shocking figure. But not surprising when you realize most users are tapping only 10% of their computer's capabilities.

So before you pour more money into more powerful boxes and software upgrades, consider upgrading your people. Send them to ExecuTrain,

the computer training

leader. Independent



Studies of ExecuTrain clients show that just one day of training

nology investment.

ExecuTrain training works because our instructors are first and foremost communicators, people

who have a true talent and affinity for teaching. Our unique courseware presents simple concepts one at a time in plain English, not computerese. And classes are limited to about 10 students, so everyone gets the personal attention they need.

But our program doesn't end when class is over. With our unlimited free telephone support for students, an instructor is as close as the phone if a question comes up later about a subject covered in their course.

We offer more than 150 courses plus customized training on your proprietary soft-

ware. And, because ExecuTrain has over 70 locations worldwide, we can tailor a program for one office or your entire organ-

ization. The best part: there's no risk. Every one of our courses comes with a money-back guarantee.

So how do you start getting your productivity payoff? Call today for your free People Upgrade package.



are experienced professionals who know



1-800-535-9479

He offer more than 150 cours for more than 150 courses, ith courseware that breaks wn material into simple, vasy to grasp concepts

1993 Execultrain Corporation. All Rights Reserved. Execultrain and the Execultrain logo are regured trademarks of Execultrain Corporation

SPREADSHEETS Q & A

Roll Over, Quattro

I use Quattro Pro to manage the inventory for my shade-tree nursery. I've set up a database worksheet where I record the year each variety of tree was planted, the size of the trees, and other facts. In a separate worksheet, I have a sizable table of database statistical functions that summarize the data by variety. Now I'm ready to roll the worksheet over to the next year, so I'd like to set up a new database sheet. The trouble is, I have more than 800 database functions that all refer to the original worksheet; if I switch the database, I have to edit each one of those formulas to make them refer to the new file. Do you know any shortcuts?

Timothy Power, Hastings, Minnesota

The quick-and-dirty answer is, use Edit Search & Replace. The longer but cleaner answer is, set up a whatif table, which will eliminate most of the formulas and greatly simplify the rollover procedure. Incidentally, this longer procedure will work in any spreadsheet product once you've made the appropriate command and formula modifications.

I took the liberty of reconstructing the worksheet you sent me, severely abbreviating its style (FIGURE 1). The database worksheet, which I've named VARIET92.WQ1, is shown on the left, with just 6 records (your original had about 240 rows). The report worksheet, VARIREPO.WQ1, is on the right.

The database statistical function formulas in cells B5..D7 calculate the subtotals by variety from the database sheet. For example, the formula in cell B5 is @DSUM([VARIET92]A3..E10,2, A1..A2). It looks in the database range A3..E10 of the file VARIET92 for the records that satisfy the criterion range in A1..A2 in the report worksheet, that is, for all records of the trees of the variety 'ACDEBORAH'. It sums the values in column number 2 of only those records of the database (that's column C in the database worksheet; column A is counted as number 0). The other summary formulas in B5..D7 all refer to the same database range, [VARIET92]A3..E10, but they vary the column number and the criterion range as necessary.

Now, let's say you've just set up your new database sheet for 1993, entered the new values for the varieties, and saved it as VARIET93.WQ1. You're ready to run the report. To change all the formulas to refer to the new worksheet, put the cell pointer in VARIRE-PO.WQ1 and select /Edit•Search & Replace•Block. Highlight B5..D7 and

press <Enter>. Select Search String, type VARIET92, and then press <Enter>. Select Replace String, type VARIET93, and press <Enter>. Note that the Look In option reads 'Formula'. Select Next, then All. In a flash, you've made all the database references refer to the new file instead of the old file.

Your database functions give you the answers you want, but it will take a really long time to recalculate more than 800 of them. And because every variety of tree needs its own criterion range, setting up and maintaining the report will be a hassle. When the number of records is as large as yours, a what-if table (like the one shown at the lower right of Figure 1 at A12..D16) is a faster way to get the answers, and it requires only one criterion range.

A what-if table (known in 1-2-3 and Excel as a data table) uses a small set of "seed" formulas to generate a larger table of results. In this case, the seed formulas in B13..D13 are database functions similar to those discussed previously. The one for small trees in B13 is @DSUM([VARIET92]A3..E10,2, A10..A11); those in C13 and D13 differ only in column number. The values shown in B13..D13 reflect the total number of trees of each size, because cell A11 in the criterion range is empty and thus all records are selected. To generate the table, select /Tools . What-If 1 Variable, highlight A13..D16, press <Enter>, select A11 as the Input Cell, and press <Enter> again. Select Quit.

The command works like this: It takes one value at a time from the left-hand column of the table (A14..A16), enters it into the input cell (A11), recalculates the formulas in the top row of the table (B13..D13), and enters the result into the corresponding row of the table, Since the table does not consist of formulas, you must refresh the table by pressing <F8>. When you add a new variety of tree, insert it into the list in A14..A16.

Finally, when you need to roll your worksheet over to the next year, you can still use Edit•Search & Replace, but you need to change the formulas in B13..D13.

Restricting the Screen in Excel

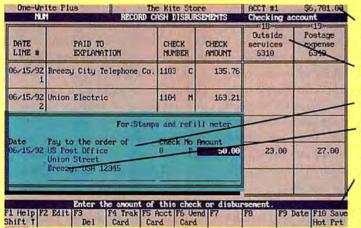
I've just switched from Symphony to Extel. Unfortunately, I can't seem to duplicate one of Symphony's nicest features: the capability to restrict the view and cursor movements to a portion of a large worksheet (it's the command



FIGURE 1: ORGANIZE A QUATTRO DATABASE by putting the data (shown at left) and reports in separate worksheets. The database statistical functions on the right summarize the database records.

one-write plus®

So Easy To Use, You Won't Even Know It's Accounting!



Calculates new bank balance after each check.

Allocate expenses to your business categories.

Prints checks ready to mail.

Fill in on-screen checks or auto input information from vendor cards.

Pop-up Chart of Accounts, Help, Vendor lists & more at touch of a key.

	General Ledger (GAAP)*	Audit Trail to Prevent Fraud	Tracks Your Inventory	Auto A/P Discount
One-Write Plus 3.0	Yes	Yes	Yes	Yes
QuickBooks™ 1.0	No	No	No	No

Whether you're already using a manual one-write system or not, you'll start up quicker, control your business better, do your bookkeeping faster and more accurately with new One-Write Plus Version 3.0 than with any other accounting software. You don't have to settle for a glorified personal checkbook program to account for your business.

The Fifteen-Minute Setup

Select your accounting periods and the Chart of Accounts for your business (14 built-in). Or transfer your manual one-write accounts by keying them in. Add or modify accounts any time, even while you're entering checks and receipts.

Familiar Check Writing



Choose from three invoices (Inventory, Service and Professional) to fit your business.

Circle 222 on reader service card

Select "Checks and Disbursements" from the Menu, and you'll feel right at home. You'll fill out the

very same, simple one-write check you're used to, right on your PC's screen. Allocate portions of check amounts to your One-Write Plus accounts — up to 20 different accounts per check or receipt.

From here on, your PC does all the work, organizing and interpreting your financial data for you. Your Bills Pay Themselves

Pull up the "Accounts Payable" screen. Select one bill at a time to pay, and see your checking account balance change on the screen.

Press "Enter," and neatly print out all your checks with names and addresses from your Vendor file, on most dot matrix or laser printers. Or do checks by hand, if you prefer.

Instant Reporting

In minutes you get Income Statement, Receivables Aging, Budget versus Actual, Balance Sheet, Trial Balance, whatever you need. And if things don't look just right, you can make adjusting journal entries in seconds.

Control Your Business' Destiny

New One-Write Plus Version 3.0 gives you new control over your business. Set budgets for any period up to two years,

and compare any combination of actual versus budget. In amounts or percents... your choice.

one-write plus

ACCOUNTI

You get password protection for security. Pop-up vendor and customer lists so you don't have to re-write things. And you can see which invoices are overdue, every single day.

FREE Gifts When You Buy

Buy One-Write Plus Version 3.0 Accounting for just \$79 (reg. \$129) now and we'll send you NEBS Mailing List Software FREE (reg. \$49.95) and a \$50 NEBS Forms Gift Certificate.

You owe it to yourself and your business to try real accounting software that's as easy to use as a checkbook.

For Faster Service Fax Your Order to:

1-800-777-6885

or Call:

1-800-388-8000

You must mention mail code 68147 to take advantage of this offer.

NEBS, Inc.

500 Main Street, Groton, MA 01471 All rights reserved. Not valid with any other offer. Expires 7/31/93

*Follows Generally Accepted Accounting Principles (GAAP).

System Requirements: IBM PC or compatible, MS-DOS or PC DOS version 3.1 or higher is required (3.3 or higher is recommended). 640K RAM and Hard Disk. IBM compatible printer required.

Yes! Please send me One-Write Bill my credit card (or check or money Mailing List Software and \$50 NEBS Fo	Plus Version 3.0 for only \$79.*, plus shipping. order enclosed), and send me my FREE NEBS orms Gift Certificate now.
Payment Method: ☐ Check or money of Please Charge my: [* (AZ, GA, MA, MO,	order enclosed payable to NEBS. ☐ VISA ☐ MasterCard ☐ American Express TX, WI residents add applicable sales tax.)
Account #: Signature: Daytime Phone:	□5¼" disks (Prod. #16230
Name:	Mail to: NEBS, Inc. 500 Main St. Groton, MA 01471

SPREADSHEETS Q & A

<F9>•Window•Settings•Restrict• Range). How do I do this in Excel? Garrett Cross, Albuquerque, New Mexico

A You can combine a couple of *Excel's* features to make quick and elegant work of restricting the worksheet.

First, in the column immediately to the right of the range you want to show, click on the column letter to select the entire column. Hold down <Shift> and press <End><Right> to select all the columns to the right of the range. Select Format • Column Width, and click Hide in the resulting dialog box. Similarly, hide all columns to the left of the area you're not restricting. Now click the row number of the first row just below the range you want to show, hold down <Shift>, press <End><Down>, and use Format • Row Height • Hide to hide the row

below the unrestricted area. Finally, hide any rows above it.

Cell pointer movement is now limited to the visible range, and you'll be able to use split panes within the area. To keep other users from disturbing the arrangement, select Options Protect Document and enter a password.

Create a view to store the current screen arrangement so you can easily reproduce it later: Select Window • View, click Add, type a name for your new screen arrangement, for example Restricted, and click OK. When you want to apply this restricted view to the worksheet, select Window • View, select your named view, and click Show.

If you don't have a View choice under the Window menu, you need to install View Manager using your *Excel* installation disks. During the installation pro-

cedure, in the Excel Setup Options dialog box, check the Microsoft Excel check box, click on the Excel button, check the View Manager check box in the resulting dialog box, and click OK. Then click Setup; Excel will prompt you for the disk it needs.

Spreadsheet Toolbox

You're the training manager for a company with 500 employees, and 1-2-3 is one of the basic tools of the trade. You arrange the classroom training for the staff, but it's expensive, so placing an advanced user in an introductory class, or vice versa, is a real waste of time and money. It would be great to know about the spreadsheet skills of a prospective new hire. Isn't there an efficient way to objectively measure people's knowledge of 1-2-3?

Yes, indeed. The Judd Test: Lotus 1-2-3 is an almost ideal solution. When you run the test, it launches 1-2-3 on your system (a special "restricted use" edition of 1-2-3 is included, just in case you need it). A series of pop-up windows explains the test procedures and then poses a graded series of tasks. Tasks run the gamut of basic 1-2-3 operations, including simple graphs, macros, sorting, and database procedures. The examinee can use any of the resources of 1-2-3, including the help system, to complete a task. When finished with a task, the user types an exclamation point to go on to the next. The Judd Test scores the test and writes the results to a file.

It's the details that make *The Judd Test* a superior product. The examiner can configure the test to include or exclude various tasks and can identify examinees by name, social security number, code number, and so on. Scoring is sophisticated—it indexes both the user's accuracy and efficiency. And reports are available at various levels of detail, right down to a record of the individual keystrokes! Created by a Stanford Ph.D., the test is based on sound psychometric principles, and the documentation is exemplary. A test for *Excel* is in the works.

I give The Judd Test an A!

The Judd Test: Lotus 1-2-3 \$495; Mentrix Corp.; 800/767-5833 Reader service no. 606

Lost in Excel Macro Land

I'm an experienced spreadsheet user struggling to get started with Excel macros. I'm finding them to be very different from 1-2-3's keystroke macros. How can I go about learning the basic concepts? Once I figure out how to think about Excel macros, I can probably do the rest on my own. Pam Campbell,

Centralia, Illinois

A I'm going to recommend \$75 worth of books, but trust me they're worth every penny. First, get Reed Jacobson's Excel Trade Secrets for Windows, published by Que (ISBN 1-56529-055-0, \$39.95). Carefully study the material in Chapter 2 about range names and Chapters 14 and 15 on macro concepts. Then hock your toaster oven and buy Microsoft Excel Macros Step by Step by Steve Wexler and Julianne Sharer (Microsoft Press, ISBN 1-55615-496-8, \$34.95). Start at the beginning, skim through until it starts getting challenging, and then work your way right on through to the end.

When you're done with your reading, you'll want to take a careful look at a professionally prepared example. Crank up Excel, select File Open, and double-click on the \LIBRARY directory underneath your Excel program directory in the Directories: list box. Find AUDITXLA, the add-in macro sheet that helps diagnose problem worksheets. (It will be there if you did a standard installation of Excel; if it's not, use the SETUP program to install it.) Hold down Shift and click OK to open the add-in as a standard macro sheet.

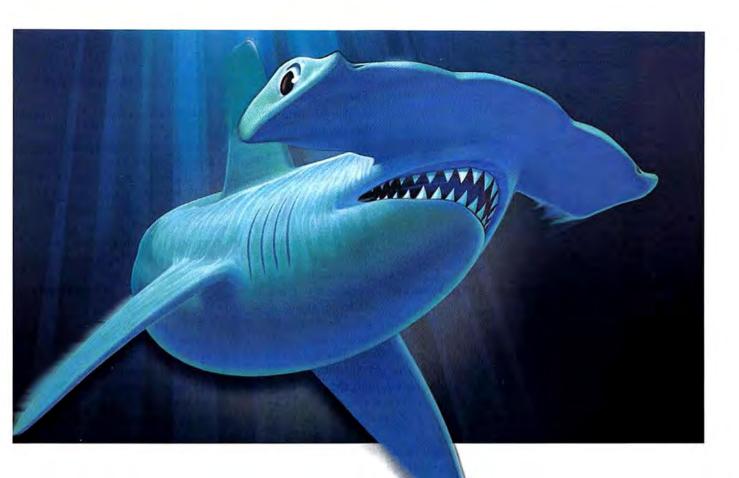
In AUDIT:XLA, notice the physical layout of the macro statements, dialog box tables, and menus. Note the documentation, including the names and comments columns. And pay attention to the range names. If you run the macro a few times and analyze the statements one cell at a time, you'll learn loads about how to build structured Excel macros using Excel guru Will Tompkins's EDJ methodology, which is fast becoming the industry standard.

Handy Lookups in 1-2-3?

I'm using 1-2-3 release 3.1 to manage my kids' soccer league teams. I'm entering everyone's birth date, and I want a way to group them by age. For example, if a kid was born between August 1, 1981, and July 31, 1982, he or she would go into the U-11 ("11 or under") group. What's the best way to do this?

Cliff Karten, Johnston, Rhode Island

A quick way is to use a lookup table and a set of lookup functions. To set it up, start with a blank worksheet and select //Worksheet • Global • Format •



IN THE WILD, IT'S A KILLER. IN BUSINESS, IT'S A LIFESAVER.

Dominant. Powerful. Precise. That's the formidable character of the QMS* 860 Hammerhead Printer. Its singular purpose is to provide you with sharp, clear printouts. Fast, compact and capable of remarkably accurate printing without hesitation, its mere presence in the market has caused excitement everywhere.

This desktop printer is a creature like no other — able to produce high resolution 600x600 dpi output for camera-ready originals or accurate prepress proofs. Up to 11x17/A3 output for more flexible page layout and design.

With QMS CrownTM technology, the QMS 860 HammerheadTM operates in mixed environments of PC, Macintosh* and workstation systems with standard and optional interfaces, supporting protocols that include



EtherTalkTM and NetWare* for ultimate compatibility. It can also accommodate multiple users through its compatibility with a variety of languages including PostScriptTM Level 2, HP PCL* and HP-GL* Yet, with all its impressive power, the QMS 860 Hammerhead is surprisingly affordable.

Others see it as a killer. You'll see it as a lifesaver. The QMS 860 Hammerhead. The perfect printing machine.



HAMMERHEAD THE PERFECT PRINTING MACHINE

Get your business "Lifesaver." Call 800 972-6695 or 205 633-4300 for your nearest QMS dealer.

QMS, the QMS logo, and Hammerhead 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 are trademarks or registered trademarks of their respective companies.

*Developer tested only. Novell makes no warranties with respect to this product.

SPREADSHEETS Q&A

	A	В	C	D	E
1	Birth Date	Tean		Lookup Table	
2	08/01/82	U-10		0	Over 13
3	03/16/78	Over 13		08/01/79	U-13
4	06/25/82	U-11		08/01/80	U-12
5	08/25/83	U-9		08/01/81	U-11
6	03/28/80	U-13		08/01/82	U-10
7	03/27/80	U-13		08/01/83	U-9
8	03/26/81	U-12		08/01/84	U-8
9	11/13/84	U-8			
10		NA			

FIGURE 2: CONSTRUCT A LOOKUP TABLE IN 1-2-3 for a quick way to group individuals by age group.

Other • Automatic to allow 1-2-3 to format the birth dates properly. Enter all the dates and labels as shown in FIGURE 2 in A1..A9, B1, and D1..D8. In B2, enter the formula @IF(@CELL("type",A2..A2)="b","NA",@VLOOKUP(A2,\$D\$2..SE\$8,1)), and use /Copy to copy it into the range B3..B10.

The heart of the formula is the function @VLOOKUP(A2,\$D\$2..\$E\$8,1). This formula takes the number from column A and looks for a match in the leftmost column of

the table at D2..E8. When it finds a date equal to or less than the date in column A, it skips one column to the right and returns the label from column E. Remember that spreadsheet dates are numbers denominated in days. where day 1 is January 1, 1900, so the smaller the birth date number, the older the kid. The 0 in the table's top row (row 2) handles everyone old-

er than the maximum age group.

The rest of the formula is decorative: @CELL("type",A2...A2)="b" is true when A2 is blank, thus causing the @IF function to display 'NA' when there's no birth date in column A (like in B10).

Constant Subtraction Is Getting Me Down

I would like to subtract a constant value, say 1.25, from a column of numbers in an *Excel* worksheet without having to sub-

tract it from each number separately. How do I do this?

Steve Skahill, Dubuque, Iowa

A There's a very easy way to do this using Edit•Paste Special. Let's say your numbers are in A1:A20. Pick a cell, say, B1, and enter 1.25. With the pointer on cell B1, select Edit•Copy. Select range A1:A20, select Edit•Paste Special, and click the Subtract radio button in the Paste Special box. Click OK, and you've subtracted 1.25 from each number in A1:A20.

By Richard Scoville

Richard Scoville is a contributing editor for PC World and a software training consultant based in Chapel Hill, North Carolina.

Mail your spreadsheet questions to Spreadsheets, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to the Spreadsheets forum on PC World Online; CompuServe, 72341,2727; MCI Mail 357-4517; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

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

Switch by keystroke, from front panel, or RS232 port

Cascade units to support up to 255 CPUs

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

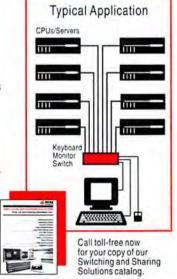
Supports monochrome, EGA, and VGA

Two or four ports per 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



Keyboard controlled unit

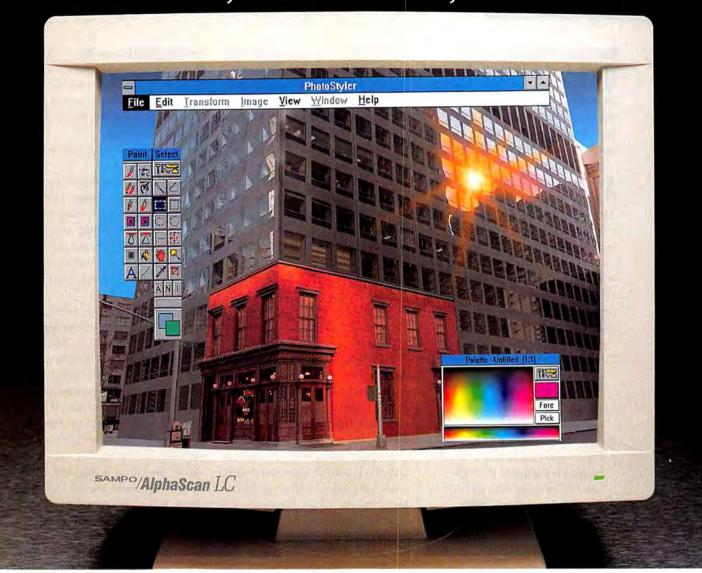


Other Rose products: Print servers, printer sharing units, print buffers, keyboard monitor extenders, video splitters. All Rose products are US-made and have a 1-year warranty.

Make the Rose Connection



THE FIRST RULE OF WINDOWS IS REAL ESTATE, REAL ESTATE, REAL ESTATE.



The 20," 1280 X 1024, Non-Interlaced SAMPO AlphaScan LC Color Display Now Available At The Competition's 17" Price

It's twenty inches of high res, high powered Windows performance that lets you make the most of your display real estate. How does SAMPO do it? It's easy when you're already building corporate grade displays for some of the world's largest workstation manufacturers.

The New SAMPO AlphaScan LC is 100% VESA compliant, and compatible with virtually all Super VGA graphic controllers and autosyncs up to 1280 x 1024, non-interlaced

resolution. Rich color saturation, sharp text and graphics, ergonomic control features, and big screen real estate, make the SAMPO AlphaScan LC ideal for Windows, as well as CAD and publishing.

If you demand the most from your display systems and your budget; just compare our product to their product, our specs to their specs, or, if that isn't convenient, compare the image in our ad to the image in theirs. The difference is obvious.

Finally, compare their price to our fiercely competitive SAMPO price. You'll choose SAMPO.

To make the SAMPO choice at a dealer near you, please contact one of our fine distributors listed below.

SAMPO A M E R I C A

The Best Monitors You Never Heard Of

(404) 449-6220

FAX: (404) 447-1109

NEW ENG. Hi-Link 800-683-9535 Action Data Dist. 508-359-4848 NEW YORK Micro Central 800-836-4276 MID-ATLANTIC Distribution Plus 800-998-0316 AW Industries 800-638-0520

SOUTH Crescent Computers 800-852-6294 Sesame Systems

800-876-6789

MicroUnited 800-755-8800

MID-WEST
red PC Wholesale
800 800-525-4727
tales Technologies

Mid States Technologies 800-876-2242 WEST COAST Colfax 415-968-3806

CDI

800-321-9932

CANADA Merisel 800-268-1220

Circle 255 on reader service card

WORD PROCESSING Q & A

WordPerfect 5.1 Base Font Switchers

I often need to change the base font in WordPerfect 5.1, but it's a pain to press <Ctrl>-<F8>F and scroll through the list of fonts each time I do it. Is there an easier way?

Steven Kayser, Wantag, New York

Making your base font changes is a perfect job for a set of easy-to-record <alt>-key macros, Start WordPerfect with a blank screen. Press <ctrl>-ctrl>-key macros, Start WordPerfect with a blank screen. Press <ctrl>-ctrl>-key macros, Start WordPerfect with a blank screen. Press <ctrl>-to fonts you want to make available in your macros, then press <f1> to return to the editing screen. Follow the steps below for each font you want to assign to a macro.

- Press <Ctrl>-<F10> to start the macro recorder.
- Hold down Alt and type an easy-to-remember key for a particular font.
 For example, try Alt Times Roman. Type a description for the macro, then press Enter.
- Press <Ctrl><F8>F, then use the cursor keys to select the base font you want assigned to the macro. Press S to select the new base font, then type in the point size and press <Enter>.
- Press <Ctrl>-<F10> to complete the recording.

Repeat this process for each font you'll use frequently, giving each a different hot key. Whenever you're using WordPerfect 5,1, you can switch base fonts by pressing the <Alt>-key combination you've assigned to your favorites.

Disk Full Error in WordPerfect for Windows

When I was working on a large WordPerfect 5.1 for Windows document containing a lot of graphics, I got a 'Disk Full' error when I tried to save. I was surprised because my hard disk has over 18MB of free space. I found a directory, WP}WP{TD.1, on my disk that contained two files, WP}WP{.GF1 and WP}WP{.GF2, which totaled almost 18MB in size. I couldn't find any reference to these files in the manual and lost all my edits. What's going on? Nick Williams, Walnut Creek, California

A When you import a graphic image into a WordPerfect for Windows document, WordPerfect converts it into a format it can use and then stores the image in a temporary file. The more graphics, the bigger the file. That file stays in place as long as the document is open and is deleted when you close it or exit WordPerfect for Windows. As you discovered, in a long, graphics-laden document, the temporary files can get unmanageably huge, especially if you're using scanned TIFF color images. And you can't save your document because the disk is full. It's a catch-22.

The solution is to break your document into smaller segments and work on each part separately. When you have finished editing, you can close one section and work on anoth-Temporary files won't become so monstrous, and you'll be able to save your document. If you must work on the entire document at once, you'll have to free up enough hard disk space to accommodate the temporary files.

From WordPerfect to Ami Pro

I recently switched from WordPerfect 5.1 for DOS to Ami Pro 3.0. Is there a way I can convert my old Word-Perfect documents into the new Ami Pro format for editing?

Ketan Patel, Roselle Park, New Jersey

A Easily. When you import your old WordPerfect documents into Ami Professional 3.0, you'll retain almost all the formatting, including tables and multiple columns from the old documents. You may have to change some fonts manually, however. Here's the process:

After starting Ami Pro, select File•

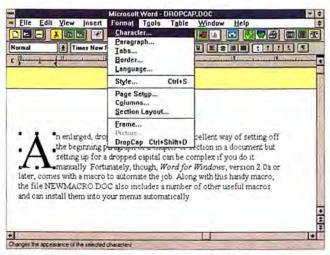
Open. In the List files of type list box, choose WordPerfect 5.0 & 5.1. Next, select the appropriate drive and path to find your existing WordPerfect documents; choose the file you want to open in the Files list box, and click OK. Now select OK in the Import Options dialog box (the default Convert Styles option works best in most cases).

Once the import is complete, you'll see the document on the Ami Proscreen. If your Windows environment doesn't include the same fonts as your old WordPerfect printer drivers, you may have to alter the document's fonts. Make any other changes and select File Save. Type in a new file name, then select OK to save the file in Ami Proformat.

Ami Pro will automatically store the new file in its normal document directory. If you need to convert more files, repeat the process. Ami Pro will remember the directory where your WordPerfect documents are stored.

Dropped Caps in WinWord

I need to create dropped capital letters in Word for Windows 2.0. I've tried doing it simply by changing the font size for the first character of a paragraph, but the character extends above the paragraph. That's not the effect I want. Is there an easier way to do this? Sunny Singh, Queens, New York



CREATE A DROPPED CAPITAL LETTER in Word for Windows with the DropCap macro found in the NEWMACRO.DOC file.

INTRODUCINGTHEULTIMATEUTILITYFORCOMPRESSEDDATARECOVERY.

Soyou'reworkingwithcompresseddata,huh? You need the Norton Utilities 7.0.

NEW FEATURES

- · Complete DOS 6.0 Support
- Automatic Compressed Data Recovery
- Advanced Recovery Mode for Physically Damaged Disks
- Large Hard Drive Support up to 2 Gigabytes
- Optimization of Compressed Data
- · Hardware Diagnostics

This new version of the world's best-selling utility not only supports your regular files, but also offers total protection for DOS 6.0 DoubleSpace, Stacker, SuperStor, and SuperStor Profiles. No other single product gives you such complete compressed data support.

With Norton Utilities 7.0,

compressed data users can take full advantage of the features Norton is famous for.

Like Speed Disk, which defragments your files for faster disk access and improved data recovery. And the Norton Disk Doctor, which identifies potential problems inside your system, and then automatically eliminates them. Only Disk Doctor has automated repair functions nine of them in all—designed especially for compressed data problems.

Norton Utilities 7.0 also comes with the new Norton Diagnostics. It analyzes and tests all vital system components, including memory, communication ports,



From Peter Norton, the leader in data recovery software,

and system boards. This helps prevent data loss due to sudden system lock-ups. And gray hairs due to data loss.

What's more, our Disk Editor is now armed with something we call Advanced Recovery Mode. For the first time, you can actually recover data from physically damaged disks. (Perfect for times when

they mysteriously find their way into your coffee cup.)

To pick up Norton Utilities 7.0, take advantage of the upgrade offer below.

Yourcompresseddatawillthankyou.

Now current customers can pick up the Norton Utilities 7.0 for up to \$130 off the suggested retail price. Here's all you do:

To Upgrade from Norton Utilities: Send us the original first page from any version of a Norton Utilities manual and Norton Utilities 7.0 is yours for only \$49° To Upgrade from PC Tools (any version): Send us the original first page of your manual and we'll send you Norton Utilities 7.0 for only \$99"-you save \$80. Disk size | 5½ HD | 3½ HD For faxed information call 1-800-554-4403, To order directly call 1-800-453-1062 (code AA27) or fax your order to 303-727-4611, Or enclose this card and your payment in an envelope addressed to: Symantee Fulfillment Center; Attn: Norton Utilities Offer AA27, P.O. Box 22335, Denver CO 80222-9569

Check M.C. Misa Amex

ASD STAIRED	EW	
FIGNATURE	PROS	
EAME	COMPANY	
DORES		
III)	17111	- 10

Na photocopus; please Limited to one (squi for each proof of ownership

Plus 88.50 shapping and broudling and applicable advetor for AZ, CA, CO, CT, DC, FL, GA, IA, IL, IN, MA, MI, MD, MN, MO, NJ, NY, OH, PA, TX, VA, WA, WI, Include applicable beach tacfor AZ, CA, CO, GA, NY, MN, CH, TX, VA, WA, WI, Offer good to U.S. only.

Please alloch order form with payment Albur 2 weeks for processing your order No P.O. Boxes on C.O.D's accepted



Chainse infrant Labort document 475 Vidat in the U.S. and Counter only Furnam-information in Europe, cult 34 74 354111. In Australia, call 642 878 6577, In Cincula, call 1800 365 256. Everywhere else may vary 6 1003 Symmetre Carperatum. If paintine for receipt, please include exception conflicture a letter paraling number. Sowlers are not classible.

WORD PROCESSING Q & A

Word for Windows versions 2.0a and later come with a file, NEWMACRO.DOC, which you should find in your main Win-Word directory. It contains a macro that automates this task. To install the macro. first select File Open, choose NEWMAC-RO.DOC, and click OK. You'll see a list of available macros. Choose DropCap, then click on Install. In the next dialog box, choose a Template (NORMAL is the

default), choose the Menu to hold the new entry (Format is ideal), enter a shortcut key if you wish, then select OK. You'll again see the previous dialog box; select Cancel, then select File • Close to unload the NEWMAC-RO.DOC file. To make your new menu entry permanent, select File . Save All.

Any time you want a dropped capital letter at the beginning of an existing paragraph, position the cursor anywhere in that

paragraph and select Format • DropCap, the new menu command. If you're not already in Layout View mode, WinWord will automatically switch to that mode, then place the first character in a frame in a larger size. Once the dropped capital is in place, you can modify the font size of the character or resize the frame using normal WinWord commands. To return to the Normal editing mode, select View . Normal.

A New Start for Word 5.0

Is there a way I can force Microsoft Word 5.0 to automatically show me a list of documents at start-up?

Harold Ennor, King City, Oregon

Word 5.0 will automatically run a macro with the name AUTOEXEC every time it starts. If you want to customize this macro, start Word, then complete the following steps:

- 1. Press <Shift>-<F3> to start macro recording.
- 2. Press <Ctrl>-<F7> to display a list of
- 3. Press <Shift>-<F3> to finish recording, then type AUTOEXEC and press <Enter>.
- 4. Press < Esc>TGS to save the macro and make it permanent.

Now, each time you start Word 5.0, you'll see a list of DOC files in the current document directory.



ờ POWERTIP 🖦 285

Protecting WordPerfect Merges

If you have multiple-line fields in a WordPerfect secondary (data) file, blocks of information in your merged documents may end up split between pages. To avoid this, block-protect the merge codes in your primary document: In the primary file, place your cursor at the beginning of the merge codes and press either <F12> or <Alt>-<F4> (Block). Move your cursor to the end of the merge codes and press <Shift>-<F8>. Press Y at the Protect Block prompt. When you merge your primary and secondary files, your merged data will be block-protected.

> Marilyn G. Butler Gadsden, Alabama

A Printer this good needs to be shared!



LASERNET ShareCard™ for the HP LaserJet 4

With the LaserNet® ShareCard from Western Telematic, your office or work group can now economically share the power and performance of the new HP LaserJet 4 printer!

Plug-N-Go ShareCard comes with 7 or 10 user card, I Meg of memory, cables and custom utility software.

Simply plug ShareCard into MIO slot of the printer and connect the supplied cables. Configure from the

front panel or use the supplied utility software.



High speed simultaneous input on all ports.

Flexible:

Works with PCs, Servers, Macs and minis.

Economical:

7 User Model-LJF-7 (6 serial, 1 pl) - \$595 10 User Model-LJF-10 (10 serial) - \$695

Also works with:

- LaserJet IIISi Paint]et XL300
- Design]et 300 &t 600
- . ShareCards for HP II, IID, III, IIID also available

Call or FAX today for more information on ShareCard or our many other LaserNet Printer Sharing Products.

1-800-854-7226

714/586-9950 • Fax: 714-583-9514



western telematic inc.

5 Sterling, Irvine, CA 92718

INGRAM MICRO

Copyright 1993 Western Telematic, Inc. All trademarks are the property of their respective companies

At just 11.5 x 9.5 x 2" and 5.5 lbs., the PanelBook is the smallest LCD panel ever, yet still has all the features.

Introducing the PanelBook 550 from

In Focus Systems.® An LCD panel should fill the room. Not your briefcase. That's why we developed the new PanelBook.

It's the smallest and most convenient LCD projection panel ever. Up to 40% smaller than most panels.

The next-generation active-matrix LCD panel. Keep the features.

Lose the weight. With the new PanelBook, you don't give up anything. It's fully featured with integrated data and video.

Inside, you'll find a drawer that expands the panel to full size. It also makes a handy place to store

the wireless remote.

Another innovation from the leader in LCD technology.

In Focus Systems
offers a complete
family of LCD projection solutions for all

Sternational Business Travel Corporate discrete in a state of the stat

your needs. From low-cost black &

white and color, to

fully integrated

projection

high-resolution workstations and

ANNOUNCING A VERY SMALL BREAKTHROUGH IN LCD PROJECTION TECHNOLOGY.

So it projects from simple presentations to full-blown multimedia. In 1.4 million colors at 640 x 480 resolution.

For world travelers, the PanelBook supports NTSC, PAL and SECAM video standards and has a universal power supply.

As easy to use as it is to carry.

Setup is a snap. Just plug it into most any PC or Mac, and place it on an overhead. That's all there is to it.

The secret is in the drawer. How'd

we make it so small? We started with a 9.4" LCD and an innovative design for the future. Unique optics project the

PanelBook's image to about the same size as much larger LCDs.

systems. We also offer the LiteShow II", our exclusive presentation-management system. Our new PanelBook just happens to be one of our

FOR MORE INFORMATION & A FREE PRESENTER'S IDEA GUIDE, CALL I-800-327-7231.

biggest breakthroughs. Or would that be the smallest?



Introducing The First Truly Intelligent Labeling System!

Someone finally figured out the perfect labeling

No more messy labels...no more scratched-out words, or curled and torn labels to stick in your disk drive. Now there's LABELIT'

it's even been lab tested and used by the world's largest computer companies.

Safety assured...LABELIT" absolutely

LABELIT* proves that in a very complicated world, there is still room for a very simple idea

LABELIT* consists of a set of peel-of adhesive label-holders made of transparent plastic and a series of individual label inserts, available in five colors. Once the label-holder is permanently affixed to your disk, all you have to do is write the necessary information on the label of your choice and slip it into the label holder. It's simple and convenient

Not too big, not too small... LABEUT" fits all floppy disks just right And LABEUT" is also available for Mini and Maxi Data Cartridges, and VHS video cassettes



BIZMVART

Can't find LABELIT™? Call 1-800-627-7752









Circle 217 on reader service card



\$50,000 World Class Contest

Now you've gone too far!

Turn back to page 95 right now for a chance to win your share of \$50,000 worth of top-rated hardware and software products.

Fill out and mail the PC World 1993 World Class Award ballot today!

Guaranteed prizes for hundreds of early-bird entries!

Changing WinWord Directories

I like Word for Windows, but wish it didn't automatically store all my documents in the default Word for Windows directory. I prefer to store my documents in a separate directory, and would like Win-Word to use that directory for its default. Is there a way to do this?

Tony Gelphman, Sacramento, California

You bet, as long as you have version 2.0b or later. Start WinWord and select Tools Options. Scroll the Category window until you see the WIN.INI icon and select it. In the Startup Options list, select the item that reads 'DOC-path='. In the Setting field, change the current path to your document directory, select Set, then select Close. From then on, when you run WinWord, it'll know where to find your documents.

If you're still using an earlier version of WinWord, you can change the default directory in Program Manager. Click once on the WinWord icon, then select File • Properties, and change the drive and path in the Working Directory box. There's one caveat with this approach; WinWord may occasionally miss some of its own files. A better solution is to call Microsoft and ask for an upgrade.

By George Campbell

George Campbell is a contributing editor for PC World.

Mail your word processing questions to Word Processing, PC World, 501 Second St. #600. San Francisco. CA 94107; or send them electronically to the Word Processing forum on PC World Online; CompuServe, 71571,222; MCI Mail, GCAMPBELL; or 415/442-1891 (fax). PC World pays \$50 for published questions, Sorry, we can't acknowledge unpublished materials.



Unattached Excel

In Excel 3.0 and higher, two cells don't have to be next to each other to be part of a selected range. If you hold down <Ctrl> while you click on cells, you will select the cells you click on but not those in between.

> Yaron Shapira Bethesda, Maryland

Once I started managing my information with PageKeeper, I realized I could get back to being a manager. My staff hardly knew who I was

anymore. I was so buried in data I never thought I'd see any of them again. Then our MIS guy suggested PAGEKEEPER.™ The results were fantastic. The first thing I did was let PAGEKEEPER index the files on my hard drive — so I rediscovered all

kinds of stuff I thought I'd lost.

Then I started scanning in the piles of paper on my desk. PAGEKEEPER's built-in OCR automatically reads any document and stores it *intelligently*. But the scanned image is still there – charts, graphs, scribbles, even coffee stains. Giving me



access to all my information. But for me, retrieval is where this product really shines. I've never been able to find information so fast – or so easily. I simply type



in a few words I think the document contains and PAGEKEEPER does the rest. Caere's new Weighted Relevance Retrieval™ technology means the documents I'm most interested in are right at the top of the list. And when I've found what I want, PAGEKEEPER's builtin e-mail lets me easily share information with my whole team.

That's my PageKeeper story. The one that let me get back to my job. To get your copy of PageKeeper, see your local Caere dealer or call Caere for more information: 1-800-535-SCAN.

For Your Information.

Here's How

WINDOWS Q & A

Enter the Drag-and-Drop

On my PC at work, I can drag a file from File Manager onto a minimized Word for Windows icon to open the file. This doesn't seem to work on my home PC. I'm running Windows 3.1 on both machines. What's wrong?

Marianne Marchant, Laie, Hawaii

A Windows 3.1 enables the wonders of drag-and-drop, but only for applications that employ this technology. Word for Windows 2.0 and 2.0a don't have this feature, but versions 2.0b and 2.0c both do. If you're a licensed user, you can get the upgrade free by calling Microsoft's Word for Windows technical support at 206/462-9673.

Once you've upgraded, by the way, you can also open files by dragging them from File Manager and dropping them on *Word for Windows*' title bar or on the blank *WinWord* background (visible only if no documents are open or if you've cascaded or otherwise arranged document windows accordingly).

Making File Manager Mind

I routinely use Recorder to construct macros within Windows' File Manager. Unfortunately, I keep tripping over the same problem when I try to navigate to files within a macro. Depending on whether the current selection highlight is on a disk drive, in the directory window, or in the file list,

Recorder behaves differently. Can you suggest a command or keystroke that will always put the selection highlight in the same place? Rick Cattell,

Los Altos, California

A Sure thing. When you start your recording, simply press <Ctrl> plus the drive letter of your choice to move the selection to the drive icon. For example, press <Ctrl>-C to switch to drive C:, <Ctrl>-D for drive D:, and so on. From that point, <Tab> to the tree or file list in order to finish your macro.

Clearing Off the Norton Desktop

My new 50-MHz 486 computer came with Windows 3.1, DOS 5.0, and Norton Desktop 2.0 for Windows installed. I don't have any need for Norton Desktop. How can I remove

this program from my computer and be certain that I have removed all of its files and changes to my system? Marion F. Smith, San Diego

The solution to your problem is really very simple. Just locate and double-click the Norton Desktop Uninstall icon. If for some reason you aren't able to find the icon, choose File•Run in Norton Desktop, Program Manager, or File Manager. Then type c:\ndw\install/u (substituting a different drive letter or path if necessary), and click OK. Follow the on-screen prompts to remove all traces of Norton Desktop.

Managing PostScript Font Downloading

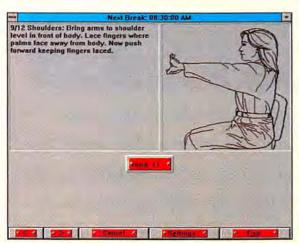
I recently installed several Post-Script fonts via Adobe Type Manager 2.5's control panel. When I print on my HP LaserJet III using a Pacific Page PE PostScript Cartridge, all the new fonts default to Courier. When I remove the cartridge and use the PCL language, I change the printer driver, and all the ATM fonts print fine. How can I get all my fonts to print correctly with my PostScript cartridge?

May Johnson, New Orleans

When you installed the fonts, you apparently unchecked the 'Install as autodownload fonts for the PostScript driver' check box. Checking this box when installing fonts adds information to your WIN.INI file that tells your computer to download each font to your PostScript printer for each page that requires it. After the page is printed, the font is cleared from the printer's RAM. This process is known as automatic downloading. Because you did not check this option, your fonts will not print in your printer's PostScript mode until they are manually downloaded-a process that requires a special utility to send the fonts to the printer's memory.

To switch your fonts to automatic downloading, launch the ATM Control Panel, and in the Installed ATM Fonts list box, select the fonts that are giving

Windows Toolbox



A computer program that prompts you to exercise might sound like a joke, but muscle strains—and resultant repetitive strain injuries such as carpal tunnel syndrome—are no laughing matter. The icon for Stress Free 1.1 sits quietly on your desktop for a user-specified interval and then pops up to guide you through an exercise routine featuring written instructions, animated pictures, and a timer that steps you through each exercise. You can choose up to ten sets of exercises, including Relaxation, Quick full body, Circulation, and routines for specific muscle groups. Stress Free is shareware with a registration fee of \$39.95. It's available in PC World Online's Featured in June folder (STRESS11.ZIP) and on other on-line services, or from LifeTime Software, P.O. Box 87522, Houston, TX 77287-7522; 800/947-2178, 713/474-2076 (fax). Reader service no. 639

DOS OF Menory Problems!

Safety in Numbers

Safe Memory Management Keeps Your System Running Smoothly.

What's more annoying than losing work on your PC? A crash or 'hang' destroys everything you've done since the last time you saved. That work is lost forever.

Two major causes of crashes are memory conflicts and running out of memory. To avoid these problems, many users sacrifice productivity-enhancing TSRs or useful network utilities. And that's unfortunate, because the right memory management lets you have it all—safety and performance.

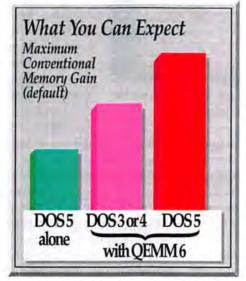
Have Your Cake and Eat it, Too.

QEMM-386th version 6 lets you run your favorite programs and TSRs without fear of 'out of memory' problems or conflicts. It provides the maximum memory right where your programs need it.

The more memory you have, the more reliability you get. No other memory manager measures up to QEMM's performance.



PC Week carefully compared them all and rated QEMM-386 v6 the best memory manager.



This is what QEMM-386 does for a typical PC. It reorganizes memory to produce greater speed and safety.

Nobody Knows Memory Like We Know Memory.

That's not bragging, just fact. As recently as two years ago, DOS ignored the importance of maximizing conventional memory. At that time, our QEMM-386 v5 provided up to 128K more usable memory. QEMM became a virtual necessity for 'power users'

Today, our latest QEMM-386 version 6 surpasses even that achievement. Thanks to our new, smart 'stealth' technology, it finds as much as 96K more high memory than other memory managers. And speaking of other memory managers, not one has yet been able to match our performance. Instead, some have slashed prices or started nasty rumors just because they couldn't reliably deliver the same results. These tactics must not work, since we outsell all the others put together.

QEMM. The Memory Manager Millions Rely on Every Day.

Considering its unsurpassed performance and the safety it adds to your system, it's no

wonder that millions of PC owners use QEMM. And it should be no surprise that 'gurus' and MIS managers consistently vote QEMM-386 the top memory manager in poll after poll, year after year.



QEMM has won more recognition than all other memory managers combined.

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.

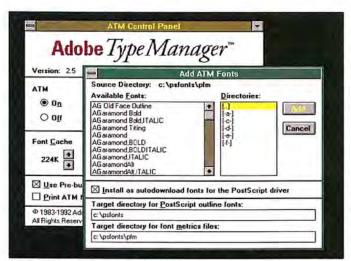
QEMM comes with Manifest, the award-winning memory analyzer that helps you avoid memory conflicts.

Whether you're running MS-DOS, IBM™ PC-DOS, DR DOS or MS Windows, don't

sacrifice; don't compromise; don't risk losing work. QEMM-386 version 6 is the most powerful, flexible memory manager you can buy. Period.

Quarterdeck

Quarterdeck Office Systems, 150 Pico Boulevard, Santa Monica, CA 90405 (310) 392-9851 Fax (310) 314-4219 Quarterdeck International Ltd., B.I.M. House, Crofton Terrace, Dun Laoghaire Co. Dublin, Ireland Tel. (353) (1) 284-1444 Fax: (353) (1) 284-4380



BY ADDING AND REMOVING A FONT with Adobe Type Manager 2.5, you can control whether a font downloads manually or automatically.

you trouble. (To select more than one font at a time, hold down the <Ctrl> key while clicking.) Then click *Remove*, and accept any prompts to remove the fonts. Don't worry; the fonts will stay on your hard disk—they're inactivated only temporarily.

Next click Add, and select the directory where you keep your font metrics files (usually it's \PSFON'TS\PFM). When the list of fonts appears, select the ones you just removed. This time, be sure to check the box next to 'Install as autodownload fonts for the Post-Script driver'. Then click Add. Since you're using the latest version of ATM, most applications won't require you to restart Windows for the changes to take effect (consult the README.TXT on your ATM disk for details).

Of course, Adobe gives you this option for a reason. Sometimes you can print faster if you download the fonts manually—if you're printing many pages that use the same fonts, for example. That's because auto-downloading flushes each font from your printer's RAM after the page is printed. Manually downloaded fonts stay in your printer's memory until you shut the printer off—handy for repeating the same font page after page.

On the negative side, manual downloading requires special downloading software and makes you download the fonts each time the printer is turned on. Moreover, if you download too many

fonts, you'll use up so much of the printer's RAM that the printer won't have enough to print your pages. If you have a choice, it's best to use manual downloading for a few frequently used fonts (such as text faces) but to call on automatic downloading for seldom-used fonts (such as display faces for headlines or advertisements).

To change automatically downloaded fonts to manually downloaded fonts, simply remove the fonts in question, click Add, then deselect the 'Install as autodownload fonts' box and add the fonts again. Then the only thing left for you to do is manually

download the fonts that you need.

Most Adobe PostScript font packages come with a pair of DOS utilities that you can use for manual downloading: PSDOWN.EXE (a menu-driven program for use with serial ports) and PCSEND.EXE (a command-line program that works with parallel ports). The latter is handy for creating fontdownloading batch files that can even be run from your AUTOEXEC.BAT file. If you don't have either of these programs but you do have Windows software from Micrografx, you can download the fonts from the dialog box for the PostScript driver that comes with most Micrografx products.

Old Files, New Error Messages

When I'm working in Windows, I sometimes receive an error message that says, 'Call to Undefined Dynalink'. Can you tell me what's going on? Thom Drayton,

Albuquerque, New Mexico

This message usually signals the presence of an out-of-date DLL (dynamic link library) file in the directory in which you installed *Windows*. Likely culprits: TOOLHELP.DLL,

SHELL.DLL, COMMDLG.DLL, OLECLI.DLL, and OLESVR.DLL.

The correct version of these files should be located in the WINDOWS\ SYSTEM directory and should have the date 3/10/92. (If you're running Windows for Workgroups, the date will be 10/1/92.) Check these file dates and their locations.

If you aren't able to find the proper (updated) file on your hard drive, look on your Windows 3.1 disk (you should expect that the extension's last character will be replaced with an underscore). To decompress one of these files to your hard drive, go to the DOS prompt, switch to your Windows directory, and then type EXPAND, the location of the original file, and the location where you want the file to end up.

For example, if you wanted to restore the TOOLHELP.DLL file from your A: drive, you would type EXPAND A:\TOOLHELP.DLL C:\WINDOWS\SYSTEM\TOOLHELP.DLL.

By Scott Dunn

Scott Dunn is a contributing editor for PC World and coauthor of 101 Windows Tips (Peachpit Press, Berkeley, California, 1992).

Mail your questions to Windows, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to the Windows forum on PC World Online; CompuServe, 74055,412; MCI Mail, 179-3813; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

POWER TIPno. 287

Auto-Load Calendar File

You can program Windows 3.1's Calendar to load the same calendar file automatically every time you launch it. Select, but don't open, Calendar's icon in Program Manager, press --Enter>, type the file's name (we'll call it JEFF'S-CAL) in the Command Line text box, and click OK.

Jeff Guillet South San Francisco, California



- PC Magazine, Mar. '93

"...in our battery tests, the TI 4000 WinDX2/50 achieved a magnificent 6 hours and 24 minutes."

- Portable Computing, Apr./May '93'

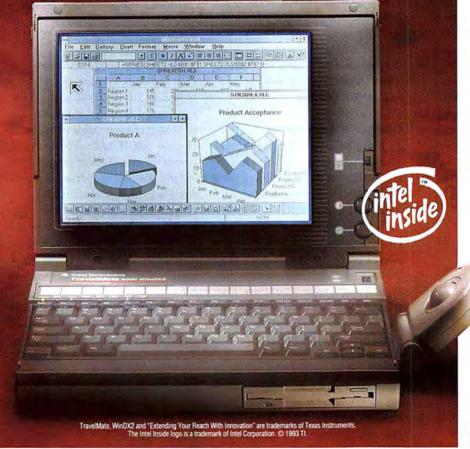
"TI has done more to customize and optimize Windows than the other notebook vendors."

- Windows Magazine, Feb. '93









TI TravelMate 4000 WinDX2/50

OUR PERFORMANCE IS GETTING RAVE REVIEWS.

As well it should.

For starters, the TravelMate[™] 4000 WinDX2[™]/50 notebook computer comes with a 486 DX2 50MHz processor for increased speed and performance.

It's specifically designed around built-in Windows, so it's able to power up in just 30 seconds.

And its amazingly long battery life is made possible by TI's superior power management system.

For more information about the incredible, lightweight, award-winning TravelMate 4000 notebooks, simply call 1-800-527-3500.

TravelMate 4000

486 WinDX2/50 4 or 8MB RAM std. (20MB max.) 120 or 200MB HDD

5.6 pounds

486 WinDX2/40 COLOR 8MB RAM std. (20MB max.) 200MB HDD 6.3 pounds

Battery life varies according to model and use.



EXTENDING YOUR REACH WITH INNOVATIONTM



Circle 244 on reader service card

DATA MANAGEMENT Q&A

Marking dBASE Records After Printing

I use dBASE III Plus to print catalog labels for new prospects. Each day I enter names and addresses into a data file called MAILING. This file includes a date type field called Sent, which I leave blank. About once a week. I use the REPORT command to print labels for all records with a blank Sent field, then I add a date to Sent for all the new records.

The whole process works fine, except that I hate having to go back and mark the records in the Sent field so that people don't get catalogs twice. Is there an easier way to do this?

Ann Tompkins, Chicago

You have a good procedure set up. A By running a short program like the one in FIGURE 1 to do a mailing, you can make the process even better. You can create this program in any text editor; to use the one that comes with dBASE, type MODIFY COMM at the dot prompt. As you enter the lines, substitute the name of your report form for the word Labels in the third line (the second line is a comment that you can omit). Save your

USE Mailing

* Use your own report name for Labels REPORT FORM Labels FOR ; Sent = CTOD("") GO TOP REPLACE ALL Sent WITH DATE(); FOR Sent = CTOD("")

FIGURE 1: PRINT LABELS AND UPDATE DATA with this short dBASE III Plus program.

> program as LETTERS.PRG. When you want to print your labels, enter DO LETTERS at the dot prompt.

Saving Deleted dBASE Records

In the June 1992 issue, the Data Basics column showed how to determine which dBASE III or dBASE. IV records have been marked for deletion. In my particular application, it

would be useful to copy these deleted records to another file. Could you tell me how to do this?

Joe Marciniuk.

Edmonton, Alberta, Canada

You can easily save the information A in dBASE records that are flagged for deletion, before reusing or zapping them, with the COPY command. At the dot prompt, with the file you want to copy from open, simply enter the command COPY TO oldrecs FOR DELETEDO. dBASE will create a new data file named OLDRECS containing the flagged records. You don't, of course, have to name the file OLDRECS.

Since COPY creates a new file, you'll need another technique if you want to append "deleted" files to an existing OLDRECS file. In this situation, enter the command COPY TO temp FOR DELETED(). Then USE OLDRECS and run the command APPEND FROM temp.

Counting With Paradox Queries

Using Paradox, I'm trying to count the number of records in my ORDERS table for each customer, and I'm obviously doing something wrong. I do an Ask query on ORDERS, checking only the Customer # field and typing in the calculation Calc Count. But when I press <F2> to Do_It!, I get a count of 1 for each customer number, even though some customers have ordered more than once. How do I get Paradox to give me the right answer? David Newman, Honolulu

Easy. All you do is add the keyword All after Cale Count, This tells Paradox to include all records in the count for each customer. As long as you have just the Customer # checked, you should get the answer you want.

Drawing Lines in Paradox Reports

I'd like to include boxes around some of the data in my Paradox 4.0 reports. Right now, I'm using dashes or the underline character to "draw" lines,

USER GROUP TIP

Memos and Memory in dBASE IV

When editing or browsing dBASE IV or FoxPro, you can discover if a Memo field contains data by looking at the word memo. If it's capitalized, that means there is text.

Bob Coppedge

Greater Cleveland PC Users Group

but they don't look very good. Can I get real boxes with corners, intersecting lines, and so on?

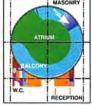
Randy Dillon, Santa Clara, California

You can put good-looking boxes in your Paradox reports, but it takes a little time (well, maybe a lot). First, open your PAL Reference manual to the ASCII character table in Appendix H-any ASCII table will do. Look toward the end of the chart and vou'll see the box- and line-drawing characters. For example, character 179 is a single vertical line, and 196 is a single horizontal line. There are also characters for box corners, middle-of-the-line intersections, and combinations of single and double lines. Keep this chart handy while you work.

Unfortunately, your printer might not use the same extended ASCII characters as does character-based DOS (and Paradox). Some printers, including the HP LaserJets, offer these characters as an option, but not the default. To use this option, enter report design mode and select Setting · Setup · Custom and your printer port. Type the control code for changing your printer's symbol set (just add it to the end of the string if there's already one present). For a LaserJet, the code is \027(10U. Then enter a reset string to return to your printer's default (\027(8U for a LaserJet).

Now you're ready to draw your lines.





GET YOU THE PROMOTION. THE POWER TO WIN THE NEW PIECE OF BUSINESS. THIS IS THE FUNDAMENTAL IDEA BEHIND THE CANON CJ10 WITH OPTIONAL CONNECTIVITY. TO GIVE YOU HIGH-QUALITY

COLOR COPIES. TO GIVE AFFORDABLE ENOUGH GET THE POWER. CALL

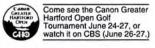


YOU THE POWER OF COLOR. FOR ANY SIZE BUSINESS. 1-800-OK-CANON.





Come see us at COMDEX BOOTH # 1630



1992 Canon U.S.A., Inc.

Canon is a registered trademark of Canon Inc.

Bubble-Jet** CJ10 logo, and color mark are trademarks of Canon Inc.

Macintosh* is a registered trademark of Apple Computer, Inc.

Windows** is a trademark of Microsoft Corporation.



THE POWER OF COLOR IS YOURS.

Canon

For a single character, move the cursor to the place you want the line and hold down the <alt> key while entering the character's number code on your keyboard's numeric keypad. When you lift <alt>, the character will appear.

If you're creating a long line, that can get monotonous. Luckily, you can use miniscripts to automate the process. To create a single horizontal line, press -<F10">Alt>-<F10, choose *Miniscript*, and enter FOR x FROM 1 TO n TYPEIN CHR(196) ENDFOR, where n is the length of the line in characters. For a single vertical line, change the miniscript to FOR x FROM 1 TO n TYPEIN CHR(179) DOWN LEFT ENDFOR. You'll still have to put in the corners and intersections individually.

Preferences for Access Reports

I don't care for many of Microsoft's formatting defaults in *Access* reports, and I'm always changing things like text size and fonts. Can you tell me how I can create my own defaults that will come up every time I start a new report?

Mark O'Connell, San Francisco

A Yes, I can tell you how. First, define the properties you want as the default in a single report. For example, to change a report's default font for fields, bring up that report in the designer, select a field, and change its font. With the field still selected, choose Layout • Change Default. This sets the default for that particular report.

You must assign those default properties, and any others you've changed, to all new blank reports. Choose View • Options • Form and Report Design. Go to the Report Template option in the Items list, type the name of the report you just changed, then press OK. Your new defaults will be in place.

Customizing Data Entry With Approach

I've been using Approach to create reports for my dBASE databases. I suspect it would be simpler to forget about dBASE and enter and edit the data directly in Approach. But I don't know how to put today's date in a field automatically. Can I do this and other database modifications easily with Approach?

Tom Wagner, Los Angeles

Approach has a Data Entry Options dialog box that lets you control data entry. To use this feature, open your data entry form (if you open a dBASE file, Approach will create a default form) and select View • Design. Double-click on the field you want to customize. When the Field Style dialog is shown, click on Field Definition and then on Options. The resulting Data Entry Options dialog box will give you plenty of choices, including one to insert the creation date in a new record.

By Celeste Robinson

Celeste Robinson is the author of The Paradox 4.0 Handbook (Bantam Computer Books, New York, 1992) and a contributing editor for PC World.

Mail your questions to Data Management, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to the Data Management forum on PC World Online; CompuServe, 74055,412; MCI Mail, 179-3813; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

The Perfect Back-up For An Imperfect World.

Accidents don't happen in perfect worlds. In this world, the best solution is VALITEK.

VALITEK builds every tape back-up drive as though your business depends on it. There's no safer, simpler, smarter tape back-up drive anywhere. No installation. No controller cards. No pre-formatting tapes. Back-up from 60 MB to 1.2 GB with speed and reliability no bargain basement tape drive can begin to match.

Complete portability. Rock-solid construction. Uncompromising quality.

When you can't afford to lose a single bit of data, can you afford anything less than VALITEK?

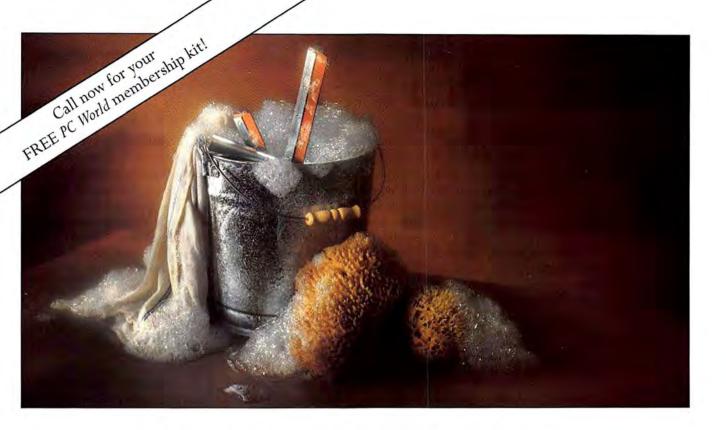


100 University Drive, Amherst, MA 01002 CALL: 1-800-VALITEK or 413-549-2700 FAX: 413-549-2900 BBS: 413-549-7560

The worldwide leader in parallel/serial technology

Circle 224 on reader service card





CompuServe does Windows.

Introducing a whole new way to look at CompuServe: CompuServe Information Manager for Windows (WinCIM[®]). It's a fully integrated Windows application, and lets you

take advantage of Windows when you're on CompuServe. It'll make your session faster, more efficient, easier, and a lot more fun.

With the help of icons and pull-down menus, you'll

find your CompuServe time is almost effortless.

Cruise the forums, browse through your messages, download files — it's all about as simple as clicking a mouse button.

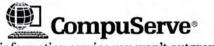
And with WinCIM you can do more offline, too. That means everything from writing letters to reading the answers to your hardware and software questions can be done

much more economically.

PC World is now available on CompuServe, too, with a special introductory offer: order now, and get a free membership kit (new members only, please), including a \$15 usage credit.

Just call 1 800 848-8199 and ask for the *PC World* representative. Outside the United States and Canada, call 1 614 457-0802.





The information service you won't outgrow.™

PUBLISHING & PRESENTATIONS Q & A

Colorful Backgrounds in Harvard Graphics

I just bought a copy of Harvard Graphics 3.0 to create charts, but I don't like the canned backgrounds. How do I create my own backgrounds? Lynn Walterick, Bartlesville, Oklahoma

The fastest way is to edit the chart palette, then blend two colors to create a shaded background. Load your chart, press <F6> to reach the main menu, and select Setup . Color palette to open the color palette screen. You'll see the background color in the preview box that appears in the upper-right corner. The small box on the left side of the preview box is the starting color box for shaded backgrounds, and the small box on the right side is the ending color box. The three boxes below the preview box let you pick the shading direction (side to side or top to bottom) or choose a solid background color.

To create a shaded background, follow these steps:

1. Move the cursor to the starting color box and press < Enter>, or if you are using a mouse, click the box; you'll see a white frame appear around it. Then move the cursor to the chart colors palette on the left side of the screen and press < Enter>, or click on the color you want to select it. You can also

choose colors from the custom colors palette (below the chart colors palette) if you like.

- 2. Move the cursor back to the sideto-side or top-to-bottom box (on the upper-right part of the screen) and press <Enter>, or click one of them to select a direction for the shaded background.
- 3. Move the cursor to the ending color box and press **<Enter>**, or click the box. Then move the cursor back to one of the color palettes (on the left of the screen) and pick out the other color you want to use.
- 4. Finally, press <F6> (File) and select Save palette to save the chart palette using a new name and, if you like, a description. Press <Enter> to finish saving the file.

You'll see the new blended colors in the background preview box. To see a preview of your current chart with the new background, press <F9> (Edit Palette) and select *Redraw chart*, or press <F2> (Show chart) for a full-screen view. Now just press <F6>-E to exit and return to the main menu. (If you chose the full-screen view, hit <Esc> first to return to the color palette.)

To use the same shaded background behind every chart, follow these steps:

1. Select Presentation • Edit Presentation from the opening menu and load

your presentation file.

- 2. In the Edit Presentation screen, press <F8> (Options) and select Presentation appearance.
- Press the space bar to set 'Use presentation chart palette' to Yes and press <Enter>.
- 4. Press <F3> to view the list of files in Harvard's Palette directory. Now, move the cursor to highlight the palette you want, and then press <Enter> to set the Presentation chart palette option.
 - 5. Press <F10> twice.

select Presentation • Save presentation, type the file name and the description (if desired), and press <Enter> < Enter>.

From now on, Harvard will apply the same color palette and background to each chart in the presentation. To view the entire presentation, press <F2> (Preview) from the Edit Presentation screen and press <Enter> to display each chart.

Proper Fractions in PageMaker

Is there a painless way to create fractions in PageMaker?

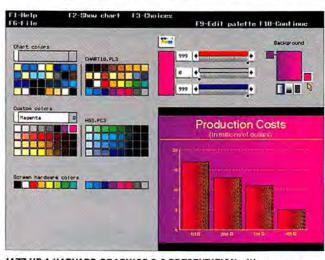
N. Weisel, New York

A Yes, if the only fractions you need are ¼, ½, and ¾. Most standard text fonts, such as Windows 3.1's Times New Roman and Arial, provide those three common fractions as alternate (or extended) characters, which you can easily insert into your text by holding down the <Alt> key and typing 0188 on the numeric keypad to get ¼, 0189 to get ½, or 0190 to get ¾.

Creating other fractions takes a little more doing. Here are the steps:

- Select the text tool and select Type • Type spees or press < Ctrl>T to open the Type specifications dialog box. Choose the font you want and click OK.
- 2. Insert the text cursor in your document and type the fraction—for example, % or ½—using a slash (/) between the numerator and the denominator. Then select the entire fraction.
- Select Type Type specs Options or press < Ctrl>-T and < Alt>-0 to open the Type options dialog box.
- 4. Now you can adjust the position of the numerator and denominator by changing two of the Type options default settings: Type 60 for the super/subscript size and type 0 for the subscript position setting. Click *OK* twice to save the new settings and return to your fraction.
- Select the numerator and press <Ctrl>-<Shift>-\ to make it superscript.
 Select the denominator and press <Ctrl>-\ to make it subscript.

The fraction is now formatted and



JAZZ UP A HARVARD GRAPHICS 3.0 PRESENTATION with your own shaded color background. You can select a side-to-side or top-to-bottom blended background using any two colors you want.



The steal of the century!

An unbeatable value

Introducing the Borland® Office for Windows—an unbelievable deal on the three best Windows programs, all in one package! If you own any Windows or DOS word processor, spreadsheet, or database, Borland and WordPerfect are working together to bring you a deal you can't miss.

WordPerfect.® the world's most popular word processor and winner of BYTE's Readers' Choice

Award; Quattro® Pro for Windows, the spreadsheet that just won InfoWorld's Product of the Year Award; and Paradox® for Windows, the easiest-to-use relational database, and winner of PC Magazine's See your dealer or call now, Editors' Choice Award. If you could put together your own office of Windows software products, this would be it.

The three top products for the price of one. This is more than a deal—this is the steal of the century!

Limited-time offer. Special upgrade price \$29995

90-day, money-back guarantee!

| 1-800-336-6464, ext. 6627 |

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

Power made easy

the baseline of the denominator should be aligned with the baseline of normal text. If you'd like to make further adjustments, repeat step 4, using increments as small as % of 1 percent to fine-tune the super/subscript size and subscript position.

You can also create fractions faster by using keyboard shortcuts-<Ctrl>-<Shift>-\ for superscript and <Ctrl>\ for subscript-to format each numerator and denominator along the way before you type them. Follow these steps just before you type each fraction:

- 1. With the text tool selected, press < Ctrl>-<shift>-\, type the numerator, and then press <Ctrl>-<Shift>-\ again.
 - 2. Type a forward slash for the fraction bar.
- 3. Press <Ctrl>-\, type the denominator, and then press <Ctrl>-\ again.

Service Bureau Miniguide

I've created a presentation using Corel-Draw 3.0 and want to print the files as color transparencies, but I don't have a color printer. I've heard that there are commercial companies that can produce the color transparencies for me. Can you tell me how I can locate them and what they do? Chris Darner.

San Juan Capistrano, California

You're looking for a service bureau-a business center where you can rent PCs by the hour, as well as print your documents. Some shops have high-resolution imagesetting machines that can print your pages on camera-ready (specially coated) reproduction paper or film negatives, which a commercial print shop can then use for small press runs. Some of them also provide scanning and color slide-making services.

Many service bureaus accept your files on disk or via modem and produce your documents for you. Some shops even provide overnight turnaround. You can find service bureaus, photocopy shops, and instantprinting centers listed in the phone book.

To print your CarelDraw files as color transparencies, look for service bureaus with color PostScript laser printers, such as a Tektronix Phaser or QMS ColorScript series printer, that are capable of producing fullcolor transparencies. Prices can run from \$5. to \$15 per transparency so shop around for the best bargain. Finally, make sure the service bureau has CorelDraw 3.0 installed so you can simply send or take in your files on disk. If you can't, you'll need to save your Corel files as PostScript print files (using Corel's own Print to File option for color PostScript printers), then at the shop, eopy them to the printer.

By Richard Jantz

Contributing Editor Richard Jantz is an electronic publishing and presentation consultant in Berkeley, California.

Mail your publishing and presentations questions to Publishing & Presentations, Q&A, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to the Publishing & Presentations forum on PC World Online; MCI Mail RJANTZ; or 415/442-1891 (fax). Send make-over randidates, preferably clean and unfolded, to Publishing & Presentations, Make-Overs, at the above address. PC World pays \$50 for published questions or make-overs. Sorry, we cannot acknowledge unpublished materials.

COMING UP

Tips Galore!

This jackpot of Windows and DOS tips offers 75 new ways to help you spend less time getting your system to work and more time getting your work done. Don't miss our hot new tips on DOS 6.0 commands and utilities!

Can 486 Notebooks Give You Desktop Power?

We review 16 color 486 notebooks that promise the power of a desktop and the portability you need when working away from the office. Our comprehensive usability tests reveal just how well these units travel in real-life situations.

Plus:

- Personal Laser Printers for Under \$1000
- 13 Disk Care Utilities
- Tips on customizing icons in WinWord, buying memory upgrades, and more!





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

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

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



The eye when it sees black and white.

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

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

So stop by your nearest Tektronix dealer or call us at 800/835-6100, Dept. 28I for a free

output sample. For faxed information call 503/682-7450, ask for document # 1223. You won't find another business investment that

looks this good on paper.



Tektronix

COMMUNICATIONS Q & A

Hitchhiking on the Internet

I use America Online, Compu-Serve, GEnic, and a few bulletin boards. But all the business people I deal with seem to have Internet addresses. Can you tell me how to join? Robert Stewart, Larkspur, California

A What confuses people about Internet is, it's not an on-line service in the conventional sense. You can't subscribe to it by mailing in a card torn from a magazine. Originally a Department of Defense network, it's now a vast web linking universities, businesses, and some commercial on-line services around the globe. A true anarchy, it has no central governing body.

Internet offers a cosmos of data, software, and services. But its main advantage is, through it you can send E-mail to anyone in the world.

The easiest way to get access is to work for an Internet-linked school or business, but you can connect to it by other means. CompuServe, MCI Mail, GEnie, and America Online offer cheap E-mail links to Internet. But they don't carry the raucous Internet discussion conferences (Usenet) that are so popular. Nor do they provide access to more sophisticated features like FTP, which lets you download software and files, or Telnet, which actually lets you log on to other Internet computers.

If you want to participate in Usenet discussions, there may be a BBS in your area that carries it. Many big ones do, especially FidoNet BBS's. (FidoNet, by the way, is now linked to Internet, so you can also send and receive Internet mail via local Fido boards.) Check out the file NIXPUB.ZIP on PC World Online for a list of some BBS's that carry Usenet. Two commercial on-line services, Portal (408/973-9111, voice) and The WELL (415/332-4335, voice), also offer Usenet.

Many small commercial on-line services that provide Telnet and FTP access as well as E-mail and Usenet are springing up around the country. One is

HoloNet (510/704-0160, voice; 800/638-4656, fax or modem), which offers off-peak access through local numbers in most major cities for \$2 per hour. a2i Communications offers Internet access for \$12 per month (408/293-9010 and 408/293-9020, both modem; type "guest" when you log on).

Performance Systems International, of Reston, Virginia, sells Internet access

in a variety of packages. The company also provides users with frontend software that tames the beastly Internet interface. For \$29 per month and a \$19 sign-

up fee, PSILink Basic service provides E-mail, Usenet, FTP, and menu-driven software to navigate Internet. PSI can also link your company's network into Internet, with all Internet functions, for \$175 to \$300 per month (800/827-7482, voice; 703/620-4586, fax).

There are several files floating around BBS's and on-line services that give you more information on Internet: "The Hitchhiker's Guide to Internet" (HHG.ZIP), "Zen and the Art of Internet" (ZEN.ZIP), and "The Inter-Networking Guide" (INETMA.ZIP). You can download them individually, or in a big parcel with several other applicable files as INTERNET. ZIP from the Featured in June section of PC World Online.

And there's finally a book that helps. The Whole Internet User's Guide and Catalog, by Ed Krol, is a superb guide to Internet services written by the guy who wrote the original Hitchhiker's Guide to Internet. It's \$24.95 from O'Reilly & Associates (800/998-9938).

When Hanging Up Is Hard to Do

O I'm using Procomm Plus for Windows with a Zoom Telephonics modem, but I can't get Procomm to hang up the modem when I click on the telephone icon. Can you help?! Wayne Liquorman, Redondo Beach, California

A First, insert the modem command &02 into the software's initialization string (right after 'AT' at the beginning of the string), then reinitialize the modem. This command forces the modem to pay attention to the data terminal ready signal (DTR) coming from the PC and hang up when the PC turns the DTR signal off. This is true no matter what software or modem you're using.

Internet is a vast web linking universities, businesses, and some commercial on-line services around the globe.

To find the initialization string in Procomm Plus for Windows, select Window Setup or press Alt>S to bring up the Setup window. Click on the Connection button (it turns red), and choose Advanced from the menu at the top of the window, Click on the Modem Setup button. The initialization string is at the top. Insert the &D2, click OK twice, and then reinitialize the modem by selecting Communication Initialize Modem from the main menu or pressing All>J.

In addition, you should make sure that Procomm Plus for Windows drops the DTR signal between calls. Click on the open book icon at the top left of the screen to get to the dialing directory, then select Dial • Options. You'll find a check box called Drop DTR Between Calls—make sure it's checked.

By Judy Heim

Judy Heim is a contributing editor for PC World.

Mail your communications questions to Communications Q&A, PC World, 501 Second St. #600, San Francisco, CA 94107, or send them electronically to the Communications forum on PC World Online; CompuServe, 75300,713; MCI Mail, 312-7737; GEnie, JUDY.HEIM; Internet, 3127737@mcimail.com; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

Total et al. When you oversee the most technologically advanced

When you oversee the most technologically advanced race in the world, the engine is running long before

the race starts. Massive amounts of data need to be collected. Everything from

entry fees, qualifying times and

speeds to engine serial numbers and driver and crew information. Then all the data collected durPCs
t
1

ing the race needs to be compiled so the results can be validated.

At the world's most famous motor speedway, mission critical is a way of life. That's why the United States Auto Club (USAC*) and the Indy 500* have a computer system with the horsepower to get the job done. And OS/2* is the driving force behind it.

With true pre-emptive multitasking and multithreading capabilities, OS/2 helps USAC process Indy 500 data at record speeds. In fact at this year's Indy, USAC is testing an OS/2-based system that tracks cars via radio signal. In 1994, OS/2 will drive the official timing and scoring system, and determine the actual winner of the race.

Whether you measure speed

in MPH or MHz, OS/2 brings the same high performance to all your DOS, Windows™ and OS/2 applications. And our soonto-be-released Version 2.1 will be even more powerful. To find out how OS/2 can help your 386 and 486 machines run on all cylinders, call 1800 IBM-3-OS2.*

Operate at a higher level.

Indy 500.

*In Canada call 1-800-465-7999.

IBM and OS/2 are registered trademarks of International Business Machines Corporation. Indy 500 is a registered trademark of IMS Corp. Windows is a trademark of Microsoft Corporation. USAC is a registered trademark of the United States Auto Club. © 1993 IBM Corp.

HARDWARE Q&A

IDE Hard Disk Upgrade

I plan to upgrade to a 170MB IDE hard disk. Do I need to buy a controller to go with the drive? My system already has an IDE controller built into the motherboard.

Tom Nguyen, Carbondale, Illinois

Actually, your motherboard has an IDE interface, not controller. IDE drive manufacturers build all the required controlling electronics onto the drive itself, so you don't need a separate controller. You can hook up any IDE drive to any IDE interface, whether the interface resides on the motherboard or (less likely) on an expansion board. Just mount the drive in a free bay, connect it to the interface using the supplied ribbon cable, and plug in the power connector. The connectors on both the ribbon cable and the power cable can be plugged in only in one direction. As you'll read below, however, the physical connection may be the easiest part.

Third-Party Hard Disks

I was going to buy a replacement hard drive from the company that sold my system, but I can get a better deal at a superstore. Both the drive and the system are the standard IDE type. If I go to a third party, am I taking a risk the drive won't be compatible?

Mike Landis, Highland Park, Illinois

Not likely, though you may have to work a little harder to get drive and system to talk to each other. Before you start, you'll need the following information about the new drive: the number of eylinders, the number of heads, the preformatted capacity, the number of sectors per track, the landing zone, and the starting cylinder for write precompensation. You don't need to know what these spees means—just crib them from the drive's documentation. If they're not there, extract the parameters from the drive vendor's technical support.

Next, run your system's setup routine. It's probably built into the system BIOS, which means that you can call it up with a key combination—usually <Ctrl>-<Alt>-<Esc>, <Ctrl>-<Alt>-S, or <Ctrl>-<Alt>-Insert>. (You can also press <Esc> or one of the above <Ctrl>-<Alt> combinations while your system does its power-on self test). Systems that don't have setup in the BIOS come with a setup routine on a floppy disk. If you can't access the BIOS setup or find the floppy, contact your system vendor's tech support.

Look for 'Fixed Disk 1' and 'Fixed Disk 2' (or similar wordings) on the set-

up menu. Each will be followed by a drive type number (or 'none'). You're replacing your sole hard drive, so select Fixed Disk 1. A ta-

ble should pop up listing around 45 alternate drive types, detailing the number of cylinders, heads, and so on. Beware! Drive type numbers are not standard, so don't try matching the type number on your drive with the type number in your system's drive table. Check your new drive's specs item by item against the ones listed for each drive type in the drive table. When you find a match, enter that drive type.

If you opt for a third-party drive, you probably won't find a match. Fortunately, most setup routines let you pick an unused drive type (usually Type 0, Type 47, or Type 99) and enter your drive's exact parameters. If you can't do this, select a drive type that comes closest to matching your drive's specs, provided the number of heads, cylinders, and sectors per track do not exceed those of your drive.

Unfortunately, this means wasting some of your drive's capacity. Many of today's IDE drives feature *automatic translation*, which enables a drive to keep wasted capacity to a minimum, even if the specs for the drive table entry don't match those of the drive. But watch out! Pre-1990 system BIOS's often don't support IDE drives over

100MB or even 80MB, so you could squander a huge amount of space even if the drive works properly. In such cases, get a BIOS upgrade from your system vendor before installation.

Alternatively, you can try *DrivePro* from Micro House (800/926-8299). This nifty \$100 utility claims to match any IDE drive to any PC no matter what the system BIOS says. Moreover, you don't need to access your system setup software. Just install your drive, boot from a floppy, pop the *DrivePro* disk in a floppy drive, and run the program.

Many of today's IDE drives feature automatic translation, which enables a hard drive to keep wasted capacity to a minimum.

Anyway, I tried it on two test drives, and it worked.

Finally, you'll need to run DOS's FDISK (*DrivePro* includes a similar utility that works better) and decide whether you want a huge drive C: or several smaller partitions (D:, E:, and so on; see "Tips to Organize Your Hard Disk," March). The final step is to slip a DOS system disk in drive A: and format all the partitions (enter FORMAT C:/S to make C: the boot drive).

Sound like too much hassle? Consider a new preloaded drive, such as Conner's 170MB Sof-Stor, which comes with its own interface board. Its interface does the configuring, so you just hook up cables. The drive comes preformatted with DOS 5.0 and includes Windows 3.1, Microsoft Works for Windows, and Central Point Anti-Virus for Windows. Want it even easier? Try Quantum's 240MB Hardcard EZ, a hard disk upgrade on an expansion board. Both upgrades save time, though they cost more than ordinary drives.

Clock-Doubled 486s

A guy in my office says you can install those Intel clock doubler chips in 486DXs as well as in 486SXs.

NOW AVAILABLE FOR DOS & MICROSOFT WINDOWS!

Just one EASY call to PC WORLD ONLINE

at 1-800-827-6364 Ext. 7252 Let's you access:

- PC WORLD Magazine's editors and experts in weekly online chats
- More than 300 Megabytes of the very latest Shareware
- Our searchable database of PC WORLD magazine's back issues
- Exclusive news & reviews
- The latest issue of PC WORLD Magazine "Hot off the Press"
- All this AND America Online too!

SPECIAL OFFER!

So subscribe to PC WORLD ONLINE today - we'll send you the free software you need to get - UP CLOSE AND PERSONAL!

Sign Up Now!

Win one of Media Vision's incredible new PRO AudioStudio 16 sound cards.

16 bit Stereo sound, a microphone, and lots of new software make owning the **PRO AudioStudio** like having five cards in one:

Sound Card ■ Joystick Controller
■ MIDI Interface ■ Audio Mixer ■
SCSI Controller

Join us this month on PC WORLD Online

for your chance to win one of **PRO AudioStudio 16** sound cards.



That can't be true—those Intel "Vacancy" ads made it pretty clear that 486SXs were the ones designed to be upgradable. Otherwise, being a Windows user, I'd clock double my 25-MHz 486DX in a minute.

Edward Meyer, Kensington, Maryland

A I hope you didn't make a bet. Last fall Intel began selling clock doublers, officially known as OverDrive processors, as upgrades for 486DX machines. You simply pull out your old CPU, plug in the OverDrive, and enjoy a 30 to 70 percent speed increase, depending on your application.

The catch is that OverDrives for DXs won't work in every 486DX machine. Fortunately, Intel has benchmarked hundreds of DX systems to determine which can accommodate OverDrives. To get the latest list of compatible systems, contact Intel's fax-back service at 800/525-3019. If your machine is on the list, the upgrade should work. If it doesn't, Intel either will make reasonable efforts to resolve the incompatibility or will refund your money. If your machine isn't on the list and you try the up-

grade, you aren't covered by the warranty.

At this writing, OverDrives aren't cheap: The 25/50-MHz version retails for \$549, the 20/40 MHz model is \$399, and the 33/66-MHz version lists for \$699 (SX and DX OverDrives cost the same). Since you're a Windows user, you might get more bang for your buck with a \$150 graphics accelerator card, or maybe some more memory.

The Case of the Forgetful Configuration

When I turned on my system recently, I got the message 'System Configuration Error—Run Setup'. I ran the setup program and the thing started properly, so I didn't think it was worth fixing (the warranty had expired). The problem recurred. Is a visit to the repair shop in my future? Brian Connolly, San Jose, California

A Probably not. Your system keeps forgetting its configuration because its battery is dying. In most systems, a lithium battery the size of a nickel maintains a smidgen of memory containing your system configuration when the power is off. Called CMOS (complementary metal-oxide semiconductor) RAM, this memory requires a tiny amount of power to stay afloat. But when your battery begins to fail, so does the chip's recollection of your system configuration.

Usually you'll find the lithium battery in a socket on the motherboard; replacements can be found at Radio Shack or at your nearest superstore. Some systems use a cluster of standard AA batteries instead, which you'll typically find in a plastic holder stuck to the inside wall of the chassis. If you still have your system manual, it should give you the battery's exact location.

By Eric Knorr

Eric Knorr is a contributing editor for PC World.

Mail your hardware questions to Hardware, PC World, 501 Second St. #600, San Francisco, CA 94107; or send them electronically to the Hardware forum on PC World Online; MCI Mail, 459-7102; or 415/442-1891 (fax). PC World pays \$50 for published questions. Sorry, we cannot acknowledge unpublished materials.

ImagiNation: The Happiest Place In Cyberspace.



For your FREE invitation to ImagiNation, including 3 hours of on-line time, call 1-800-SIERRA-1.

There's a whole new way to have fun with your personal computer. It's called ImagiNation: The CyberSpace Theme Park" and it's only on The Sierra Network."

The Sierra Network is on-line games and more, including products for every taste and skill level. Games range from the multi-player version of the award-winning Red Baron* and the critically acclaimed fantasy game. The Shadow of Yserbius, to more relaxing fare like Bridge and Chess. There's even multi-player games for children like Graffiti* and Boogers.* More than 20 great games so far — and more to come!

But what really makes The Sierra Network special is the sense of community that you get when you

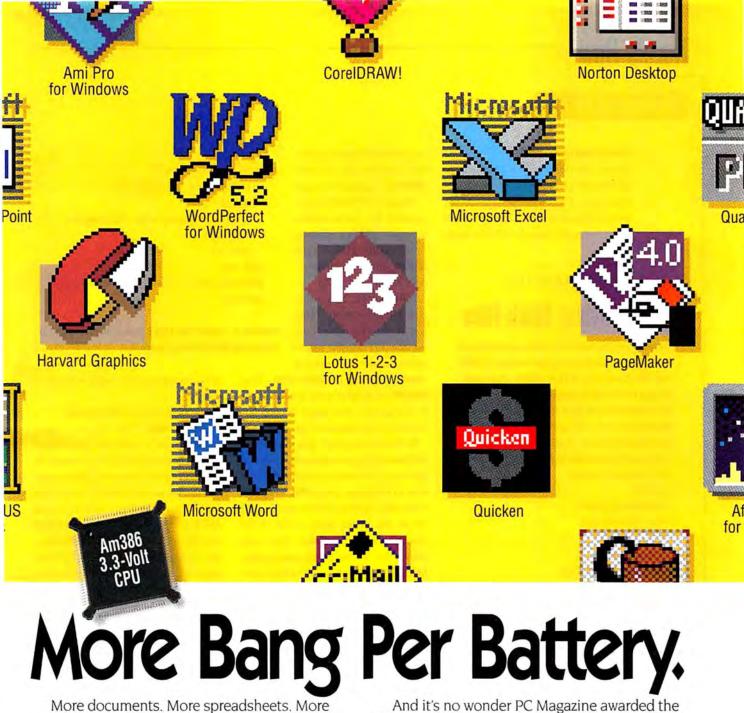
visit ImagiNatiori." Each night, thousands of friendly people gather there to play games, meet new friends, and generally have a good time together.

If you'd like to try The Sierra Network, all you need is a 386 or better computer, a VGA monitor, a 2400 band modern, and a valid major credit card. Just send in the coupon, or give us a call. We'll give you everything you need to enter the land of Imagi. Nation, and your first 3 hours ~ FREE.*

ImagiNation on The Sierra Network. There's no place that can compare to the fun and friendship of the world's first Cyber Space Theme Park.



You don't inclaim not by distribution in a part of the production of the production of the product of the produ



More documents. More spreadsheets. More presentations. Essentially, you get more work done per battery when your portable contains a 3-Volt Am386® microprocessor.

In fact, you can expect the longest battery life available, because they use far less power than other 386 CPUs.

What's more, you won't sacrifice performance for battery life. At 25MHz, you'll get all the speed you need to run Windows™ and thousands of your favorite applications.

That's why leading portable manufacturers have put 3-Volt Am386 CPUs at the heart of their next-generation portable designs.

And it's no wonder PC Magazine awarded the 3-Volt Am386 CPUs their 1992 Technical Excellence Award for paving the way in low-voltage design.

To make sure your portable makes the most of its batteries, make sure it's designed around a 3-Volt Am386 CPU.

800-222-9323



Advanced Micro Devices

Microprocessors For The Masses.sm

901 Thompson Place, P.O. Box 3453, Sunnyvale, CA 94088. © 1993 Advanced Micro Devices. Inc. Microprocessors For The Masses is a service mark, and Am386 is a registered trademark of Advanced Micro Devices. All other brand or product names are trademarks or registered trademarks of their respective holders. Icons reprinted with permission from Microsoft Corporation, Borland International, Inc., Software Publishing Corporation, Aldus Corporation, Intuit, Inc., Lotus Development Corporation, DATASTORM TECHNOLOGIES, INC., Corel Systems Corporation, Berkeley Systems, Inc., WordPerfect Corporation and Symantec Corporation.

STAR-DOT-STAR TIPS

Classic Lines in WordPerfect

When I use WordPerfect 5.1 for DOS, in addition to the number of words in a document, I often need to know the exact number of lines. Doing a word count is simple enough with the spell-

USER GROUP TIP

Disk-Efficient Batch Files

Every file on your hard disk takes a minimum of 2K to 8K, depending on your version of DOS and the size of your disk partition. Therefore, having lots of little batch files can waste a good deal of space. One solution is to create a single batch file that, given a parameter, can do the work of many. I call mine RUN.BAT, and I run it with commands like RUN 123 to launch 1-2-3. Here's a sample:

@ECHO OFF

IF %1==X GOTO NOPROG

IF %1==123 GOTO LOTUS

IF %1 == wp GOTO WP

IF %1==WP GOTO WP

ECHO NOT SET UP TO RUN %1

GOTO END

:NOPROG

ECHO PLEASE SPECIFY A PROGRAM

ECHO RUN [APPLICATION]

GOTO END

:LOTUS

C:\123\123

GOTO END

:WP

C:\WP51\WP

GOTO END

:END

Note that with most options, you must include upper- and lowercase IF... GOTO commands (123 is an exception because it contains no letters). You'll need to put the batch file in a directory named in your AUTOEXEC.BAT's PATH statement.

Alan Forro Greater Cleveland PC Users Group ing checker's Count option, but I had to write a macro [FIGURE 1] to get a line count.

To use TOTALINE, just position the cursor where you want counting to begin, press -<f10">Alt>-<f10, type TOTALINE, and press Entry. John Kirkpatrick, Tulsa

Editor's note: This macro is a big time-saver. Note that it must be created using the WordPerfect macro editor, invoked by pressing

<Home> followed by <Ctrl><F10>. Type
TOTALINE (or another name for the macro if you prefer), and press <Enter>. You may add a description if you wish.

In the macro editor, you must insert different types of commands in different ways. To insert a command shown here in boldface, press < Ctrl> < Page Up>, select the command from the pop-up list in the upper right corner of the screen, and press <Enter>. For commands that are boldface and underlined, press < Ctrl>-V and then the appropriate key (for example, <Ctrl>-V, then <Down> for [Down]). Type plainly printed text as it appears. Press <F7> to exit the editor. The complete macro, named TOTALINE.WPM, is available in the Featured in June folder on PC World Online.

Duty-Free Imports

I import data into 1-2-3 from commadelimited ASCII files—files where multiple values (fields) on one line (a record) are separated by commas. But if there's too much data on a line, 1-2-3 returns the error message 'Input line too long (240 characters max)'.

I wrote a simple Qbasic program [FIG-URE 2] that solves this problem and takes only seconds to run. It prompts for the name of a file and allows you to choose between numeric or text input. The program reads a record's fields from the source file and then writes them sequentially to the target file, each on its own line. This allows numbers or text

```
{FOR}lines-1~100000-1~
   {ASSIGN}numlines-{SYSTEM}10--
   {Down}
   {IF}{VARIABLE}numlines-={SYSTEM}10--
        {BREAK}
   {END IF}
   {END FOR}
   {PROMPT}Number of lines: {VARIABLE}lines--
   {WAIT}30-
```

FIGURE 1: COUNT THE LINES in your documents with this handy WordPerfect macro.

to be imported into a single worksheet column.

Debbie Leahy, Warrenville, Illinois

Editor's note: This program takes advantage of a quirk of Qbasic and other Microsoft BASICs: Commas in the input stream are considered to separate the stream into distinct values. You can run this program by copying it to an ASCII text file called CONVERT.BAS and typing QBASIC /RUN CONVERT.BAS at the DOS prompt. CONVERT.BAS is available in PC World Online's Featured in June folder.

Dialing Direct From DOS

Your modem makes a great, hands-free automatic telephone dialer, complete with a speaker that lets you monitor the progress of the call. Unfortunately, neither DOS nor most modems come with a utility for dialing from the DOS command line, a convenient place to do it. Here are two programs that will let you do just that.

The first utility, DTR.COM, controls the DTR (Data Terminal Ready) signal—which must be turned on before your modem will accept commands. If your modem is attached to COM1; DTR's syntax is a simple DTR ON or DTR OFF. If you're using another communications port, you must give the port address immediately after the program name, as in DTR COM2; OFF, for example.

After you've used DTR to turn on your modem, you can send a command



By The Way,
Ours Also Has
PostScript,
More Speed And
Is Easy To Use.

TI vs. HP.

Both offer advanced graphics capabilities. Superior flexibility with type. Superior paper handling. And more.

But there's one expensive difference. TI microLaser™ PS17 lists for over \$500 less than the HP LaserJet® 4.

Better still, TI microLaser PS17 comes standard with the industry graphics preference, PostScript* software from Adobe*. HP LaserJet 4 doesn't. We print 9 pages per minute, they print 8.

We're also easy to use with all of your major software programs, including Word*, WordPerfect*, Excel*, Lotus* 1-2-3* and Windows*.

TI microLaser PS17. It can extend your reach without over-extending your budget. For information and a dealer near you, call 1-800-527-3500.

EXTENDING YOUR REACH WITH INNOVATION™



Save Disk Space



PKZIP version 2.0



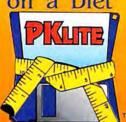
PKWARE introduces the next generation of its award winning compression utility, giving even greater performance levels than achieved with previous releases of the software. PKZIP compresses and archives files, saving disk space and reducing file transfer time.

AWARD

WORLD CLASS 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

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

9025 N. Deerwood Drive Brown Deer, WI 53223 (414) 354-8699 Fax (414) 354-8559

Internet: pkware.inc@mixcom.com

PRZIP \$47.00 PRLITE \$46.00 PRLITE Professional \$146.00 Please add \$3.50 S&tf 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. PCW 6/93

STAR-DOT-STAR TIPS

```
100 CLS
110 LINE INPUT " file: ", FILEIN$
120 LINE INPUT "OUTPUT: ", FILEOUT$
130 INPUT "(T)ext or (N)umber? ", I$
140 OPEN FILEINS FOR INPUT AS #1
150 OPEN FILEOUTS FOR OUTPUT AS #2
160 IF UCASES(IS) = "N" THEN
170
180
       INPUT #1, R
       WRITE #2, R
190
       LOOP UNTIL (EOF(1))
200
     GOTO 270
220 ELSEIF UCASES(IS) = "T" THEN
230
       INPUT #1, RECORDS
240
250
       WRITE #2, RECORDS
       LOOP UNTIL (EOF(1))
260
       CLOSE 1
280
       CLOSE 2
     GOTO 900
290
300 END IF
310 PRINT "OOPS! Invalid choice!"
900 SYSTEM
```

FIGURE 2: BREAK UP FIELDS of a commadelimited file with CONVERT.BAS.

to it with the second utility, AT.COM. The syntax is similar to DTR: AT command string if your modem is on COM1:, and AT COMn: command string if it's on another port. The command AT Z will reset your modem, while AT DT, followed by a phone number and a semicolon (;), will dial the number (the semicolon tells the modem to stay on the line until you tell it to hang up with an AT H command).

Omar Mody, Dallas

Editor's note: Mr. Mody's utilities are quite well designed, checking to make sure that the port you're accessing exists and, if you run them with a question mark as a parameter, reminding you of the correct command-line syntax. You can create a batch file to automate the dialing job even more:

@ECHO OFF DTR ON AT DT%1; PAUSE DTR OFF

To call a number, you simply pass it to DIAL as a parameter. The batch file will dial the number and then wait for you to



ALL-IN-ONE PACKAGE!

"CorelDRAW has six graphics packages in one stunning Windows program. And these are not watered down versions-they compete feature for feature against stand alone products."





VERSATILE CHARTS and GRAPHS!

"CorelCHART is the easiest charting package I've ever used, thanks to its intuitive design, ease of object editing, and the smooth integration with the rest of Corel's products."





POWERFUL PHOTO-EDITING!

"Corel PHOTO-PAINT is in a class by itself; no other product can match its image editing powers for close to its price range."





THOUSANDS OF CLIPART IMAGES AND SYMBOLS!

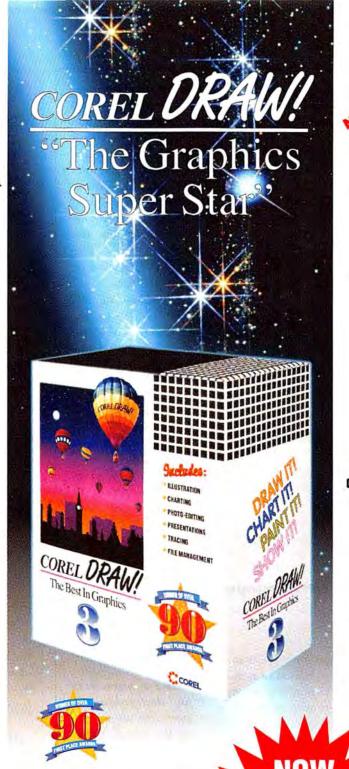
"Even if you only use a portion of the 256 fonts or 14,000 CD-ROM clipart images, you've likely recovered your investment.



CorelDRAW has emerged as the ALL-IN-ONE graphics Super Star! Celebrated by top international industry publications, it has won over 90 awards for its exceptional ease of use, incredible value and outstanding features.

CorelDRAW 3.0 outshines the competition! There is no longer any need to buy separate illustration, charting, photo-editing and presentation software, because CorelDRAW 3.0 includes CorelCHART, Corel PHOTO-PAINT and CorelSHOW —all in one value-packed box.

No wonder CorelDRAW is the world's best selling graphics package!





CorelDRAW remains the easiest-to-use graphics product on the market...The ultimate graphics bargain!"



"CorelDRAW 3.0 for Windows delivers all the graphics applications you could ask for. The program's ease-of-use, coupled with its power, has users singing its praises."



DYNAMIC PRESENTATIONS!

COMPLITE CHOICE AWARDS

"CorelSHOW, an extremely simple presentation program that makes displaying charts and drawings a snap.



GREAT TEXT HANDLING!



"CorelDRAW has what many other drawing packages lack: superb control over type... A sizzling best buy.



Call now for a free demo disk and brochure!

CDNTEL: (613) 728-3733 / FAX: (613) 761-9176





STAR-DOT-STAR TIPS

press a key before it shuts the modem off, turning control over to you and your phone.

To create the programs, copy FIGURES 3 and 4 into two ASCII text files called DTR.SCR and AT.SCR, respectively. It's easy to make mistakes when entering this type of data, so check your work carefully; I recommend checking the code in vertical columns. Then, type the commands DEBUG < DTR.SCR and DEBUG < AT.SCR at the DOS prompt. DTR.COM and AT.COM will appear in the current directory; you can move them from there into a directory that's in your AUTOEXEC.BAT's PATH state-

ment. Or you can avoid the whole process by downloading the two programs from the Featured in June folder on PC World Online.

If you have an older 1200- or 300-bps modem, you'll need to lower the baud rate with a command like MODE COM1: 1200, N.8.1.

Note that while AT-.COM sends strings to your modem, it can't receive them; you'll have to watch the modem's lights (or listen to its speaker) to tell that it's gotten your command. If your modem stays silent when it dials, use the command AT M1 to turn on the speaker before you issue your dialing command.

By Brett Glass

Brett Glass is a contributing editor for PC World.

Have a macro, batch file, short program, or general tip you're proud of? Mail your tips to Star-Dot-Star, PC World, 501 Second St. #600. San Francisco, CA 94107; or send them electronically to the Star-Dot-Star forum on PC World Online: 74055. CompuServe. 412; MCI Mail, PC World Editorial; Internet, rogue@well.sf.ca.us; or 415/442-1891 (fax). PC World pays \$25 to \$200 for each tip used. Sorry, we cannot acknowledge unpublished materials.

Ndtr.com

E100 BE 82 00 FC AC 3C 20 74 FB 3C 3F 74 1D E8 8A 00 E110 3C 43 75 22 AC E8 82 00 3C 4F 75 1A AC E8 7A 00 E120 3C 4D 75 12 AD 80 FC 3A 74 14 BA A5 01 B4 09 CD E130 21 B8 01 4C CD 21 BE 82 00 32 DB EB 09 90 2C 31 E140 3C 03 77 E6 8A D8 32 FF D0 E3 B8 40 00 8E C0 26 E150 8B 07 0B C0 75 05 BA E5 01 EB D2 8B D0 83 C2 04 E160 AC 3C 20 74 FB E8 32 00 3C 4F 75 BE AC E8 2A 00 E170 3C 4E 75 17 EC 0C 03 EE BB E2 01 B4 09 BA D2 01 E180 CD 21 8B D3 CD 21 B8 00 4C CD 21 3C 46 75 09 EC E190 24 FC EE BB DE 01 EB E3 EB 90 3C 61 72 06 3C 7A E1A0 77 02 2C 20 C3 55 73 61 67 65 3A 20 20 44 54 52 E1B0 20 5B 43 4F 4D 31 3A 7C 43 4F 4D 32 3A 7C 43 4F E1C0 4D 33 3A 7C 43 4F 4D 34 3A 5D 20 4F 4E 7C 4F 46 E1D0 46 24 44 54 52 20 69 73 20 6E 6F 77 20 24 4F 46 E1E0 46 24 4F 4E 24 50 6F 72 74 20 6E 6F 74 20 66 6F E1FØ 75 6E 64 24

RCX F4

W

Q

FIGURE 3: TURN YOUR MODEM ON AND OFF with the program that this DEBUG script creates.

Nat.com

E100 BE 82 00 FC AC 3C 20 74 FB 3C 3F 74 1D E8 A6 00 E110 3C 43 75 22 AC E8 9E 00 3C 4F 75 1A AC E8 96 00 E120 3C 4D 75 12 AD 80 FC 3A 74 14 BA 76 01 B4 09 CD E130 21 B8 01 4C CD 21 BE 82 00 32 DB EB 09 90 2C 31 E140 3C 03 77 E6 8A D8 32 FF D0 E3 B8 40 00 8E C0 26 E150 8B 07 0B C0 75 05 BA A7 01 EB D2 8B D0 B0 41 E8 E160 5F 00 B0 54 E8 5A 00 AC E8 56 00 3C 0D 75 F8 B8 E170 00 4C CD 21 00 00 55 73 61 67 65 3A 20 41 54 20 E180 5B 43 4F 4D 31 3A 7C 43 4F 4D 32 3A 7C 43 4F 4D E190 33 3A 7C 43 4F 4D 34 3A 5D 63 6F 6D 6D 61 6E 64 E1A0 73 74 72 69 6E 67 24 50 6F 72 74 20 6E 6F 74 20 E180 66 6F 75 6E 64 24 3C 61 72 06 3C 7A 77 02 2C 20 E1C0 C3 50 83 C2 05 EC 24 20 74 FB 58 83 EA 05 EE C3 RCX DØ W

FIGURE 4: THIS DEBUG SCRIPT creates a program that sends commands to your modem.

WINNING HAND!

PC WORLD

GIVES YOU A

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!

a

PC WORLD

Instant Reference Card #37

For use with PC World Instant Reference Card Portfolio

MICROSOFT DOS 6.0: UTILITIES

DOS 6.0 includes several utilities to optimize system resources and protect your data. Three of them—Backup, Anti-Virus, and Undelete—also come in *Windows* versions.

Note: Start each command within its respective utility unless otherwise noted. Keys to press are shown in **boldface**. Keys to press simultaneously are joined by a hyphen. A bullet (•) links menu, option, and button names in a series. This Instant Reference Card is the second of two on DOS 6.0; IRC #36 details the DOS 6.0 command line and the DOS Shell program.

OPTIMIZING YOUR SYSTEM

Set compression ratio

DoubleSpace creates a new logical drive that, by compressing files, nearly doubles the capacity of your hard disk. You must set up one or more compressed drives before the DoubleSpace program will run.

Note: DoubleSpace does not run in Windows.

lask	Command
Set up DoubleSpace drives or start DoubleSpace program	DBLSPACE at DOS prompt
Compress existing drive, creating new uncompressed drive	Compress • Existing Drive, select drive, <enter>, set amount of free space and drive letter for new uncompressed drive, C</enter>

OPTIMIZING YOUR SYSTEM (continued)

MemMaker optimizes the use of memory on 386 and 486 systems by making maximum upper area available and deriving the order for loading memory-resident programs and device drivers that leaves the most conventional memory free for DOS programs. MemMaker is very simple to use and has on-screen prompts; it can also run unattended. Use MemMaker after adding or removing a memory-resident program or device driver.

Note: MemMaker does not run in Windows.

Task	Command	
Start MemMaker	MEMMAKER at DOS prompt	
Run MemMaker unattended	MEMMAKER / BATCH at DOS prompt	
Undo most recent	MEMMAKER / UNDO at DOS prompt	

PROTECTING FILES

Backup selected files

Activate/deactivate

Compare/restore

backup file(s)

Restore's verification

Backup copies hard disk files so you can restore them if they're damaged or lost. There are three types of backup: *Full* copies selected files. *Incremental* copies selected files that changed since the last full or incremental backup. *Differential* copies selected files that changed since the last full backup.

Note: Where only one sequence of commands appears, it applies to both DOS and Windows versions.

Fold Here

Create new compressed drive from free space of existing uncompressed drive space to leave free, set compression ratio and drive letter for new drive, C

Compress • Create New Drive, select drive with free space, < Enter>, set amount of free space to leave free, set compression ratio and drive letter for new drive, C

estimate for selected drive

Change selected drive's size
(if reducing, defragment drive leave free on uncompressed drive, **O**K

Drive . Change Ratio, select ratio, OK

(in reducing, derragment drive first)

Mount selected drive Drive • Mount • OK

Unmount selected drive Drive • Unmount • OK

Format selected drive Drive • Format • OK

Delete selected drive Drive • Delete • OK

Defragment selected drive Tools • Defragment • Yes

Check drive Tools • Chkdsk • Fix/Check

Exit DoubleSpace Drive • Exit

Defragmenter speeds up disk access by rearranging fragmented file parts (which are scattered about the disk) into consecutive locations.

Note: Defragmenter does not run in Windows.

Task	Command
Start Defragmenter	DEFRAG at DOS prompt
Select drive to defrag	Type or double-click drive letter
Use recommended method	Select drive, Optimize
Open Optimize menu	<esc> or Configure</esc>
Change defrag method	Open Optimize menu, Optimization Method • Full Optimization/Unfragment Files Only • OK
Order files in directories	Open Optimize menu, File sort, select criterion and order, OK
Begin optimization	Open Optimize menu, Begin Optimization
Exit Defragmenter	Open Optimize menu, Exit

Task	DOS	Windows
Start Backup program	MSBACKUP	Launch Backup from Tools group; or Tools • Backup in File Manager
Select type	Backup • Backup Type, s	elect type
Select target drive/ format/directory	Backup • Backup To. Select drive/format, OK: or MS-DOS Drive • OK, type path	Backup • Backup To. Select drive/format; or MS-DOS Path, <tab> to or click path box, type path</tab>
Print setup file	File • Print • OK	File • Print, select mode, OK
Select drive to select files from	Backup, Backup From, s in Backup From box	elect drive; or click drive icon
Select/unselect all files on drive	Backup. Select drive, <s drive icon in Backup From</s 	pace>; or double- or right-click n box
Select/unselect directory's files	and the state of t	elect directory, <space></space> ; or ectory name (not folder). OK
Select/unselect file(s)	Backup • Select Files, se file, <space>; or double-</space>	lect directory. <tab>, select or right-click file. OK</tab>
Activate/deactivate verification	Backup • Options • Verify	Backup Data • OK
Use/don't use error correction	Backup • Options • Use E	rror Correction • OK
Save file selection, backup type, target, and options	File • Save Setup As, type file name or double-click name in Files box, Save	File • Save Setup As, Type file name, OK; or double- click name in Files box. If prompted, confirm overwrite

Restore Data • OK

Compare/Restore

JUNE 1993 . PC WORLD 259

Restored Files • OK

Backup. Setup File. select SET file; and/or select files, backup type, target, and options. Start Backup

Restore • Options • Verify

Restore • Options • Verify

Compare/Restore. Select backup set catalog, source, and target. Select Files, select file(s), OK • Start

Fold

MICROSOFT DOS 6.0: UTILITIES

PROTECTING FILES (continued)

Undelete restores deleted files. It has three levels of protection: Standard, the default level, can undelete a file until the space it occupied is reused (which can happen when you save new files, install programs, run Windows, or open a file in Windows). The intermediate Delete Tracker stores and reserves the locations of deleted files in a hidden file. Delete Sentry, the highest level, stores deleted files in a hidden file consure recovery. The memory-resident Delete Sentry and Delete Tracker use 13.5K of RAM each.

Note: d indicates drive; if omitted, default is assumed.

Task	DOS command
Enable Delete Sentry	UNDELETE /S[d]
Enable Delete Tracker, optionally limit entries to 1 to 999	UNDELETE /T[d][-nnn]
Display drives' current protection level	UNDELETE/STATUS
List directory's deleted files, optionally specify recovery method	UNDELETE / LIST [/ DS or / DT or / DOS]
Recover directory's files	UNDELETE [d:path/filename.ext]
Recover directory's files using Tracker if Sentry directory exists	UNDELETE/DT

PROTECTING FILES (continued)

Anti-Virus detects and removes more than 1000 viruses. VSafe, a memory-resident program, watches for and reports signs of virus activity.

Note: Do not run MS-DOS Setup or Windows Setup while VSafe is loaded.

Task	DOS	Windows			
Start Anti-Virus	MSAV	Launch Anti-Virus from Tools group or Tools • Antivirus in File Manager			
Select/unselect drive(s) to scan	<f2> or Select new drive, drive letter</f2>	In Drives list: click icon; or cursor to drive. <space></space>			
Scan memory, <f4> or Detect selected drives</f4>		Detect or Scan • Detect			
Scan and clean memory, selected drives	<f5> or Detect & Clean</f5>	Detect and Clean or Scan • Clean			
Stop scanning current drive	<f3> or <esc>, Stop • OK</esc></f3>	Pause • Stop • OK			
Get information about virus	<f9>, select virus, Info</f9>	Scan • Virus List, Select name, Info; or double-click name			
Print virus list	<f9> • Print</f9>	Scan • Virus List • Print			

Fold

Fold Here

Recover directory's files using DOS if Sentry directory or Tracker file exists

Exit Undelete

UNDELETE / DOS

Sentry directory of tracker file exists	
Recover directory's files automatically	UNDELETE / ALL / DT or / DOS
Unload Sentry or Tracker TSR	UNDELETE/UNLOAD
Reload Sentry or Tracker TSR	UNDELETE/LOAD
Task	Windows command
Start Undelete	Launch Undelete from Tools group; or File • Undelete in File Manager
Enable Delete Sentry	Options • Configure Delete Protection • Delete Sentry • OK, set options, Drives select drive(s), OK • OK • OK
Enable Delete Tracker	Options • Configure Delete Protection • Delete Tracker • OK, select drive(s), OK • OK
List a directory's deleted files	Drive/Dir or File • Change Drive/ Directory
List deleted file(s) in current drive by name/content	Find or File • Find Deleted File, type name and/or contents, OK
Sort deleted files list	Sort by or Options • Sort by, select order criterion, OK
Get info on file surrounded by selection box	Info or File • File Info
Select/unselect file(s) in list	Click name; or cursor to name, <space></space>
Select file(s) by name	Options • Select by Name
Unselect file(s) by name	Options • Unselect by Name
Print deleted files list	Print or File • Print List
Undelete selected file(s)	Undelete or File • Undelete
Undelete selected file(s) to other drive/directory and optionally rename	Undelete or File • Undelete to
Purge Delete Sentry file(s)	File • Purge Delete Sentry File

<Alt>-<F4> or File • Exit

Fillit virus nat	SP SP - FILID	Scall - Vilus List - Fillit
Set Anti-Virus to scan memory and default (DOS only) or specified drive(s) automatically	MSAV [d: [d:]] (add /P and/or /L to have Anti-Virus close when done; use /P for command line interface, /L to scan all local hard drives.)	Highlight Anti-Virus icon, <alt>-<enter>. For each drive to be scanned, add <space>drive letter <colon> to Command Line. (Add /P to have Anti-Virus close when done.)</colon></space></enter></alt>
Delete Checklist files	<f7> • Delete</f7>	Scan • Delete CHKLIST files
Activate/deactivate stealth virus detection	<f8> or Options, Anti- Stealth (leave Verify Integrity checked), OK</f8>	Options • Set Options • Anti-Stealth (leave Verify Integrity checked), OK
Disable/enable alarm sound	<f8> or Options. Disable Alarm Sound</f8>	Options • Set Options • Disable Alarm
Save/lose settings on exit	<f3> or Exit, Save Configuration • 0K</f3>	Options • Save Setting on Exit
Exit Anti-Virus	<f3> or Exit, OK</f3>	<aht>-<f4> or Scan • Exit Anti-Virus</f4></aht>
Load VSafe	VSAFE (to load TSR automatically when PC starts, add command to AUTOEXEC.BAT)	Load before Windows and add MWAVTSR.EXE to load= line in [windows] section of WIN.INI
Toggle VSafe option(s)	<alt>-V • number • <esc></esc></alt>	<enter> or Options button, select option(s), OK</enter>
Unload VSafe	<alt>-V • <alt>-U</alt></alt>	Options • Exit • OK

For use with PC World Instant Reference Card Portfolio

The More Windows You en, The Cooler It Gets."



PC WORLD Online



Windows Advice & Support



Searchable News



Expert Computing Advice



Fast, Easy Downloading



Stock Quotes & Portfolio Management



Internet E-Mail Gateway



More Than 30,000 Software Files



Encyclopedia & Homework Help



Free Trial Offer. See Other Side For Details.

Yes! I'd Like To Try America Online — Free.

Send me the free software and trial membership. I understand there's no risk if I'm not completely satisfied, I may cancel without further obligation.



k	Type	and	Size:

3.5

☐ HIGH DENSITY DOUBLE DENSITY

Do you use Windows 3.1*?

☐ Yes

J No

*You must have □ a 386 PC, □ 4MB of RAM; □ a VGA monitor, □ a mouse; □ a modem; □ and a working copy of Windows 3.1 to use America Online for Windows America Online is a registered service mark of America Online, Inc. Windows is a trademark of Microsoft Corporation.

Try America Online—Free.

There's only one way to get the big picture about America Online. Try it. That's why we make it so easy. We give you the software and let you try it, absolutely free. You'll be impressed by everything you can do with your computer, a modem, and America Online, and how easily you can do it.

Just Point and Click.

Get advice from hardware and software developers, experts and reviewers — even ask them

questions directly. Download any of the thousands of programs from our software libraries and use them offline. Monitor your investments and the latest news. Manage your business better with the help of our

Microsoft® Small Business Center. Save time and money in hundreds of different ways, from browsing for gifts in our online shopping area or booking your own airline tickets to using our great computing support forums.

New Windows To Open All The Time.

America Online offers multi-file downloading, so you can select the files you want with the click of a button, then do something else while they're

downloaded for you.

When the downloading finished, you'll automatically be signed off the service. Our e-magateway to the Internet links you to members of other e-mail and online services for no additional

cost. And new services are being added to America Online all the time. When you connect to America Online, you connect to the electronic community of the future – today

As Easy To Try As It Is To Use.

If you've never tried America Online, now's the time. If you have in the past, try us again — America

NO POSTAGE NECESSARY

IF MAILED

UNITED STATES

Online is available for DOS and now, the new Windows version fo Microsoft Windows 3.1 users – with multi-tasking, flashbar navigation, and much more.

But don't AMERICA take our

take our word for it.

Give us a try and find out what you can accomplish when you open a few our windows.

Complete and mail the card or call 1-800-827-6364, Ext. 7242, Today!



BUSINESS REPLY MAIL

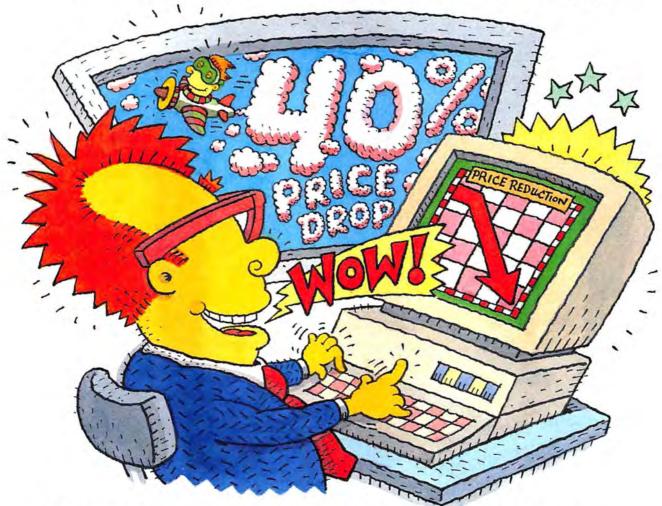
POSTAGE WILL BE PAID BY ADDRESSEE

Enline

8619 Westwood Center Drive Vienna VA 22182-9806



40% OFF THE WORLD'S FASTEST FAX MODEMS!



ATTENTION FAX POTATOES, NOW'S YOUR CHANCE TO SAVE.



U.S. Robotics just dropped the price by 40% on the Sportster® and Mac&Fax fax/data modems.

Get Group III fax capabilities. Get 14,400 bps fax/data throughput. Get V.42 / V.42 bis error control and data compression. And get all this plus WINFAX™ or Fax STF™ fax software for the Mac

bundled free with every Sportster modem you buy.

So fax, Potato, fax. It now costs 40% less.

The Intelligent Choice In Data Communications.

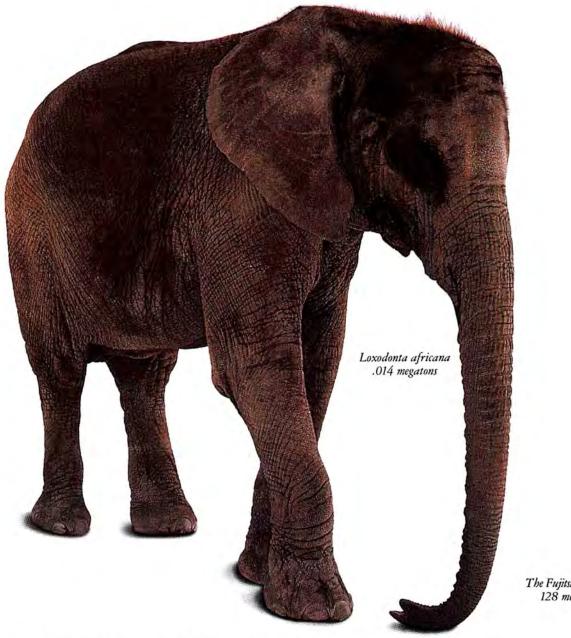
CALL U.S. ROBOTICS FOR MORE INFORMATION: 1-800-DIAL-USR. IN CANADA, PLEASE CALL 1-800-553-3560.

U.S. Robotics Inc. 8100 N. McCormick Blvd. Skokie, Illinois 60076. (708) 982-5010

Sportster is a registered trademark of U.S. Robotics, Inc. All brand or product names are trademarks or registered trademarks of their respective owners. Average price reduction for entire Sportster line. All prices MSRP.

Circle 154 on reader service card

ns. SUSHILLIGHT



The Fujitsu DynaMO 128 megabytes

OUR MISSION WAS CLEAR. REDUCE THE SIZE. ENLARGE THE MEMORY.

For the graphic artist, multimedia producer or the busy document image manager, storing large files has always been an enormous problem.

Introducing a very small solution. The new

The Fujitsu DynaMO. Never before has an optical drive had such an enormous memory with such a small footprint. Fujitsu DynaMO: It's the highest performance, external, plug-and-play optical drive for PCs and Macs. The first thing you'll notice is its low profile. (It's just 1.5"x 5.0"x 8.0.") The next thing you'll notice is

its mammoth memory. Each rewritable cartridge saves up to 128 megabytes. (Roughly the equivalent of 88 3.5-inch double-density disks.)

And because they're removable, and each data cartridge has a life of 30 years, you have virtually unlimited capacity for all of your storage needs.

Get more information on the Fujitsu DynaMO. Call 1-800-831-4094. Or, to receive the facts by fax, just dial 1-408-428-0456 from your fax machine and request document 1367.

You'll be surprised at how easy it is to store megatons of memory in the smallest model ever.



COMPUTERS, COMMUNICATIONS, MICROELECTRONICS

🛇 1993 Fujitu. All rights reserved. DynaMO is a trademark of Fujitus Computer Products of America, Inc. All brand names and product names are trademarks or registered trademarks of their respective bolders.





Win a CD ROM Drive

Fax in your opinions to enter a drawing for a Sony Desktop Library CD ROM drive.

Which articles in *PC World* are valuable to you? Which aren't? Help us improve the magazine by filling out the questionnaire below. Fax in your response and you'll have a chance to win a Sony Desktop Library CD ROM drive, featured in our May buyers' guide.

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 415/974-7445 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 6-PCW, PC World, 501 Second St. #600, San Francisco, CA 94107. Send your survey in no later than June 30; we'll notify the winner by mid-July.

HOW TO FILL OUT THE FORM: FOR BEST RESULTS, PHOTOCOPY THIS PAGE; DO NOT TEAR IT OUT. Using black pen, clearly print your name (use block capital letters) and phone number at right; fill the appropriate circle under each digit of your phone number. Below, fill the circles under the answers that apply to each article you read. First tell us whether you read the entire article or just some of it. If you didn't read it at all, leave the line blank. If you read the article, please rate its value to you on a scale from 1 (least valuable) to 5 (most valuable). WHEN FILLING THE CIRCLES, AVOID GOING OUTSIDE THE LINES! One entry per person.

	Did	Did you read it?			Value to you?				
Sample	All	Some	1	2	3	4	Most 5		
In This issue (page 19)	0	0	0	0	0	0	0		
Letters (page 23)	0	0	0	0	0	0	0		
Consumer Watch (page 31)	0	0	0	0	0	0	0		
Real Problems, Real Solutions (page 37)	0	0	0	0	0	0	0		
Top of the News (pages 42–56)	0	0	0	0	0	0	0		
1-2-3 4.0 for Windows (page 42)	0	0	0	0	0	0	0		
News Monitor (page 43)	0	0	0	0	0	0	0		
HP 100 LX (page 48)	0	0	0	0	0	0	0		
HP LaserJet 4L (page 50)	0	0	0	0	0	0	0		
cc:Mail 2.0 (page 54)	0	0	0	0	0	0	0		
Protect Your PC Investment (page 56)	0	0	0	0	0	0	0		
New Products (page 69)	0	0	0	0	0	0	0		
Marketplace (page 93)	0	0	0	0	0	0	0		
486s for \$1250 (page 100)	0	0	0	0	0	0	0		
50 Spreadsheet Tips (page 134)	0	0	0	0	0	0	0		
Windows NT: The New DOS? (page 161)	0	0	0	0	0	0	0		

First name												
Last name											4	
Daytime phone number				-				-			1	ij
1	0	0	0		0	0	0		0	0	0	0
2	0	0	0		0	0	0		0	0	0	0
3	0	0	0		0	0	0		0	0	0	0
4	0	0	0		0	0	0		0	0	0	0
.5	0	0	0		0	0	0		0	0	0	0
6	0	0	0		0	0	0		0	0	0	0
7	0	0	0		0	0	0		0	0	0	0
8	0	0	0		0	0	0		0	0	0	0
9	0	0	0		O	0	Ŏ		O	Õ	O	0
0	0	0	0		0	0	0		0	0	0	0

	Oid you	read it?	least	Value to you?					
Word Processor or Desktop Publisher? (page 178)	1.4.500	Some	1	2	3	4	Most 5		
Databases Come to Windows (page 188)	0	0	0	0	0	0	0		
Caches Pay Off (page 212)	0	0	0	0	0	0	0		
Help Line (page 220)	0	0	0	0	0	0	0		
Spreadsheets (page 224)	0	0	0	0	0	0	0		
Word Processing (page 230)	0	0	0	0	0	0	0		
Windows (page 236)	0	0	0	0	0	0	0		
Data Management (page 240)	0	0	0	0	0	0	0		
Publishing & Presentations (page 244)	0	0	0	0	0	0	0		
Communications (page 248)	0	0	0	0	0	0	0		
Hardware (page 250)	0	0	0	0	0	0	0		
Star-Dot-Star (page 254)	0	0	0	0	0	0	0		
Reference: DOS 6.0 Utilities (page 259)	0	0	0	0	0	0	0		
Business Fixtures (page 293)	0	0	0	0	0	0	0		
Games: Break Time (page 297)	0	0	0	0	0	0	0		
Home Office (page 300)	0	0	0	0	0	0	0		
HOW WOULD YOU RATE THIS ISSUE OVERALL?			0	0	0	0	0		

		llowing ways in the purchase of PCs or r organization? (Choose all that apply.)	In the next 12 months involved in buying PCs		Do you have an electronic-mail address on an on-line system (including CompuSerre, Prodigy, GEnie, Delphi, America Onlin or Internet)? If so, and if you are interested in participating in PC World electronic research projects, please write your				
0	Suggest product brands	Approve purchase	company or organizati For yourself	ion?					
0	Determine need for product	Recommend purchase channels	O Yes	O No	E-mail address(es) in the space below.				
0	Determine features needed	Make purchase	For your company						
0	Evaluate brands or models	Have other purchase involvement	○ Yes	O No					
-									



Shop The PC World Catalog For Fast Solutions To Your PC Needs

The PC World Catalog is the most cost efficient way to bring your product message to managers proficient with PCs, the group identified by study after study as today's key buyers of computers and related equipment.

Your message can reach buyers in a variety of ways. The "Business Class" section brings your ad to our 901,000 readers with four-color impact. *PC World's* "Computer Showplace" section highlights your ad in black and white, with a choice of display or text/only formats (standard red can be added as a second color).

For complete information on Catalog advertising, please call toll-free 800-262-9885 or 203/838-1425 Fax. PC World Catalog, c/o RAM, 50 Washington Street, South Norwalk, CT 06854.

Advertising Sales Staff

Pat Fales

Catalog Manager 203-857-5120

Sally Naylor

Catalog Coordinator 203-857-5100

Dean Lucente

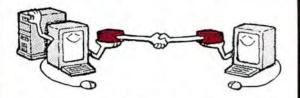
Western Account Manager 203-857-5102

Chris Kimball

Eastern Account Manager 203-857-5101

Product Category	Business Class	Computer Showplace	Product Category	Business Class	Computer Showplace
HARDWARE			On-Line Services		274
Blos Chip		270	Point of Sale		274
Communications	267	270	Public Domain/Shareware		274
Computer/Systems	267	270	Real Estate		275
Peripherals	267-268	270	Schools Applications		275
			Science	269	
SOFTWARE			Security		275
Accounting	269		Surveys		275
Business Applications	269	272	Utilities		275
CD Rom	269				
Church Applications		273	MISCELLANEOUS		
Data Entry		273	Accessories	268	270
Educational		273	Bar Coding		270-271
Financial		273	Business Opportunities		270
Flow Charting		273	Computer Insurance		271
FORTRAN		273	Data/Disk Conversion		272
Graphics		273	Disk Copy Service		272
Inventory Control/Management		273	Disks		271
Mailing Programs		274	On-Line Services	268	
Mail Order		274	Presentation	268	
Maintenance Management		274	Supplies		272
Medical		274	Toner Recharge		272
Music		274			

PC-COMPANION PLUS™



Add a second Keyboard, Monitor and Mouse up to 250 feet from your PC!

- PC/AT, PS/2 and 100% Compatibles
- Supports VGA up to 1024 x 768
- Use either PS/2 or Serial Mice
- Combine monochrome and color VGA



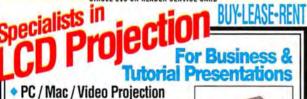
Made in USA

Dealer Program Available



2800-H Bob Wallace Ave. . Huntsville, AL 35805 U.S.A. [205] 534-0011 · FAX [205] 534-0010

CIRCLE 516 ON READER SERVICE CARD



- Color from \$2,395 to \$7,395
- 640 x 480 to 1024 x 768

Call Now For a FREE Catalog



1040 Ferry Building, #263 San Francisco, CA 94111

CIRCLE 406 ON READER SERVICE CARD



MiniSCSIPho

HIGH-PERFORMANCE PARALLEL-TO-SCSI ADAPTER

Connect up to 7 SCSI devices to your parallel port! The MiniSCSI Plus lets you run a CD-ROM, tape drive, SCSI hard disk, SyQuest, Bernoulli or other SCSI device and still use your printer port.

Trantor Systems, Ltd.
5415 Randall Place • Fremont, CA 94538
(510) 770-1400 • Fax: (510) 770-9910

Call Today! (800) 872-6867

© 1913 Trantor Systems 1st. MiniSCSI and MiniSCSI Plus are trademarks and Transact is a registered trademark of Trantor Systems 1st. All other product names are trademarks of their respective companies

"This product...is darned near perfect." -Jerry Pournelle, Byte Mag. March 1993

...even more elegant than its predecessor and almost twice as fast." -Jim Seymour, PC Mag. December 1992

CIRCLE 469 ON READER SERVICE CARD

COMMANDE

CONTROL UP TO 96 PC FILE SERVERS WITH 1 KEYBOARD. MONITOR, AND MOUSE

- · Select via Keyboard
- Dual access to 150 feet away (optional)
- "AutoBootTM" Feature boots attached computers without operator intervention
- Use either PS/2 or Microsoft serial mouse with available cables
- Each unit accommodates from 2 to 8 PCs; cascade up to 12 units







2800-H Bob Wallace Ave. • Huntsville, AL 35805 U.S.A.

[205] 534-0011 • FAX [205] 534-0010

Dealer Program Available

Made in USA

CIRCLE 517 ON READER SERVICE CARI

LIQUIDATION

NOTEBOOKS

386SX20 3mb RAM, 60mb HD

386SXL 25 MHz 5mb RAM, 60mb HD

486SLC 25 MHz 4mb RAM, 80mb HD

1295

Canon Engine
 2mb RAM

16 MHz RISC Processor Parallel, Serial, Apple talk interfaces

Postscript HPII Compatable

SONY CD-ROM With Card & Caddy \$265

LASER PRINTER
For MAC & PC 4ppm

VISA' TECHNOLOGIES, INC

5105 Maureen Lane, Moorpark, CA 93021

TEL 805-529-0908

FAX 805-529-7712

Mainframe to PC data interchange

Rock solid solutions, rock bottom prices. Direct from the manufacturer. 1600 & 6250 bpi. Subsystems include drives and software.

Europe: Tel: (+49) 6172-35027 · FAX: (+49) 6172-35028

800-729-8725

OVERLAND DATA

Since 1980 Tel: 619-571-5555 . FAX: 619-571-0982

3480 Now With IDRC!

Ask about 3480 tape drives too

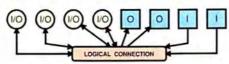
CIRCLE 430 ON READER SERVICE CARD

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) \$375 LC-512 (512Kb) \$425 8 ports; 4 serial I/O; 19,200 bps 2 parallel in, 2 parallel out

LXFR-ETC Windows & OS/2 File Transfer 4 user license, for LC or LCX

PB-42PP-256Kb PB-42PP-1Mb 6 parallel ports; 4 in / 2 out

Upgradable to 4Mb; 25,000 cps

5 parallel ports; 4 in / 1 out Smart-switch; 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

SPPS \$49 9600 bps to 115,200 bps Serial / Parallel Converter

PB-11PP-1Mb \$199 2 parallel ports; 1 in / 1 out Upgradable to 16Mb; 75,000 cps



PCMCIA 2.0 SRAM Cards: 512Kb + \$120, 1Mb - \$175, 2Mb - \$295 Toshiba:

1000XE/SE/LE, 1800, 1850, 2000,2000SX/SXE, 2200SX 2Mb - \$90, 4Mb - \$150, 8Mb - \$275 3300SL 4Mb - \$150, 6Mb - \$225

4400SX 4Mb - \$150. 8Mb - \$275

Powerbook & MAC:

100/140/145/170/160/165/180 6Mb - \$250, 8Mb - \$310, 10Mb - \$390 DUO 210/230-

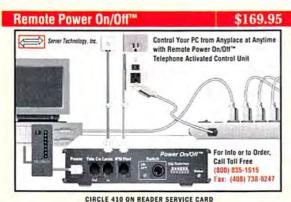
6Mb - \$260, 8Mb - \$320, 10Mb - \$410 Cent.610/650, Quad.800, LCIII 4MB - \$145, 8Mb - \$260

MAC SIMMs (70ns.): 1x8 - \$32, 4x8 - \$124, 16Mb - \$495

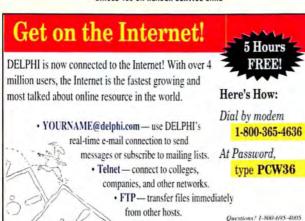
LOGICAL CONNECTION 4660 Portland Road NE #108 Salem, OR 97305-1658

Tech.: (503) 390-9375 FAX: (503) 390-9372

CIRCLE 420 ON READER SERVICE CARD









AWARD WINNING ACCOUNTING SOFTWARE

"Best Buy Award" six years running from Computer Shopper and Computer Monthly/magazines. ACT includes:

General Ledger-Accounts Payable-Accounts Receivable-Payroll-Check Reconciliation-Inventory-Purchase Order-Order Entry-and LYNX (ASCII file convertor)

ACT is quick and easy to install, features on line editable help files, complete easy to use documentation, point and shoot cursor control, stacked menu system, prints W-2s, 941s, and 1099s, and plain paper forms

During the past eleven years, ACT has developed a reputation for being extremely powerful, and flexible. FEATURE FOR

FEATURE, BENEFIT FOR BENEFIT, AND DOLLAR FOR DOLLAR, you can't buy a better accounting software package.

ACT series comes in single user, LAN and UNIX versions, WITH a 30 day money back guarantee! (15% restocking fee)

single \$199.50 shipping version \$199.50

(800)388+3038

Cougar Mountain Software

2609 Kootenai Boise, Idaho 83705

CIRCLE 401 ON READER SERVICE CARD

BUY LOW. SELL HIGH.

PC WORLD'S Business Class section offers four-color selling power at super low prices. What, you didn't know color ads outsell black and white by over 40%? But get this: your quarter page ad (on a typical, twelve time rate) will run for only \$4560 per issue! Can you afford NOT to advertise in Business Class?

Call the PC WORLD Classified Department NOW for details. 800/262-9885

Starting ness"

THE COMPLETE BUSINESS STARTUP SOFTWARE FOR TODAYS ENTREPRENEUR

SUCCESSEULLY START ANY business with this integrated software for the IBM-PC. Ease through steps, worksheets, business licences. incorporating, federal regulations.

Call 1-800-783-7053 or fax 1-205-967-3721

taxes, financing and more!

DMACS SOFTWARE

Order direct & save: \$79 (Retail:\$105) 60 day money back guarantee

CIRCLE 408 ON READER SERVICE CARD

CDROMS ■ CDROMS ■ CDROMS



Walnut Creek

CDROM

1547 Palos Verdes Mall Suite 260

Walnut Creek, CA

94596

+1-800-786-9907

Simtel20 MSDOS CDROM Over 600 megs in 9000+ files. Programming tools. DOS utilities, tech does, comm, BBS, publishing, ham-radio,

education, and much more. BBS support. December 1992 money-back CICA MicroSoft Windows CDROM Hundreds of MS Windows programs. Games, utilities, source code, and programming tools. BBS support. March 1993.

Hobbes OS/2 CDROM \$24.95 Thousands of OS/2 programs, including games utilities, and drivers. November 1992.

The C Users' Group Library CDROM The entire library of C and C++ source code, volumes 100-364

Giga Games CDROM Thousands of games for MSDOS and MS Windows. Arcade, word, strategy, and educational games. March 1993.

CDROM Caddies * Shareware programs require separate payment to authors if found useful.

+1-510-674-0783 FAX +1-510-674-0821

CIRCLE 416 ON READER SERVICE CARD

Advertising Age Reports:

PC WORLD's ad sales jumped 23.3% during last year's "recession".

Why? Because products sell when advertised in these pages. Every issue, every day, in good years and bad, PC WORLD works.

Contact Catalog sales today: 800/262-9885

The Ultimate In Weather Monitoring!

- 25 F
 - · Create daily, weekly, monthly, yearly plots
 - Compare two weather conditions on the same graph
 - Plot two days, weeks, months, or years on the same graph
 - Store data for up to 4 months before transferring to the PC Monitor conditions at remote locations

using a modem The ultimate in weather monitoring systems, Weatherlink works with any of Davis' weather stations to bring the weather to your PC!

• IBM compatible, 640K RAM required • Hercules, CGA, EGA, and VGA Call Today: 1-800-678-3669 M-F 7 a.m. to 5:30 p.m. Pacfic Time 30-day money-back guarantee • M/C and VISA • FAX 1-510-670-0589 • PW380U

DAVIS INSTRUMENTS 3465 DIABLO AVE., HAYWARD, CA 94545

CIRCLE 498 ON READER SERVICE CARD

Hardware

BIOS CHIPS

COMPUTER SYSTEMS

PERIPHERALS Cont.

ACCESSORIES

Miscellaneous

UPGRADE YOUR XT, 286 or 386!

Our experienced techs can specify a new BIOS ROM to add IDE hard drive, DOS 5.0 and Windows 3.1 support. A new Motherboard can change your slower machine into a 386 or 486 powerhouse. Full size TEK sheets make it easy.

Call for FREE Catalog KOMPUTERWERK, INC. 800 423-3400 (412) 782-0384

CIRCLE 488 ON READER SERVICE CARD

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 Call (214) 276-8072 P.O. Box 461782 Garland, TX 75046-1782 FAX & BBS (214) 272-7920

Save BIG \$\$\$ on printing costs!!!

MacInker"

Better than new cartridges for less than 5¢



Over 200,000 sold. Beautiful printing and longer printhead life. Call for complete information.

Epson MacInker	48.00
Universal Cartridge	Model79.45
MultiColor Adapter	40.00

Jet-Master

Re-usable jet-printer recharge kit. Just buy ink later as needed.



- · Simple, trouble-free operation.
- · Average recharge cost is \$1-\$2.
- · Most jet-printers supported, single and multicolor.
- · Brilliant, bold color inks available for HP cartridges.

HP Deskjet	24.95
HP 4-color	
HP QuietJet	26.95

C≡mputerFriends, Inc.

14250 NW Science Park Drive Portland, OR 97229 To Order 1-800-547-3303 Tel. (503) 626-2291

CIRCLE 483 ON READER SERVICE CARD

204 page guide to computer furniture supplies and accessories Dial Toll-Free 1-800-8-GLOBAL

ŒGLOBAL

COMPUTER SUPPLIES 11 Harbor Park Dr., Dept 91 PCW Port Washington, NY 11050

CIRCLE 508 ON READER SERVICE CARD

BUSINESS **OPPORTUNITIES**

Own a Billing Service!

Great part time PC based business. Provide invoicing and accounts receivable services to small businesses. \$500-5000 income monthly. \$289 for complete set-up incl; Software, proven marketing plan, promotional materials, and ongoing support. Bluejay Systems 2579 Clematis Street Sarasota, FL 34239 (813) 365-3357

COMMUNICATIONS

FAX-ON-DEMAND + VOICE PROCESSING

dVOICE's™ features include:

- · One call fax mode
- · Fax back mode
- Voice mail
- Text to speech
- - - · Built-in database capabilities

MULTIVERSE • 212-580-0541

PERIPHERALS



The Only Professional Choice CIRCLE 513 ON READER SERVICE CARD

PERIPHERALS

Turn Your HP® LaserJet™ Printer Into a Plain Paper Receive FAX Machine

· High level programming language

· Inbound and outbound capabilities

· Automated receptionist

What makes FAXME so practical is its quality, its performance, its value... and the security that comes with our Lifetime Warranty! Compatible only with Laser let Series II and III.



FAXME MSRP S259 ELEK-TEK \$17999



PRACTICAL PERIPHERALS.

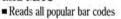
EK-TEK Call (800) 395-1000

(708) 677-7660 in Illinois 000 National-Branded ter Products yday Discounted Prices 11-Free Ordering with **REE Technical Support** Same Day Shipping on all In-Stock Items Corporate Accounts invited. 7350 N. Linder Ave. Skokle, IL 60077

CIRCLE 418 ON READER SERVICE CARD

BAR CODING

Bar Code Reader for PC, XT, AT, PS/2 and MAC



- Rugged aluminum housing
- No software/hardware modifications
- Stainless-steel wand
- 5-Year Warranty
- · Works with any program or operating system
- Withstands 6ft. Drop to Concrete

Portable Bar Code Reader for PC or Macintosh

- 36-Key Alphanumeric Key-Pad
- 32K RAM expandable to over 1 MB
- Easily programmable screen prompts
- · Complete with Hewlett-Packard wand
- Data stored in ASCII Text Format
- Communications Software and Cable Included



800-526-5920 Call Toll-Free U.S. & Canada

FAX: 415-856-3843

All TPS products carry 30-Day Money-Back Guarantee







4047 Transport Street, Palo Alto, CA 94303 Phone: 415-856-6833



- · On-line readers · Portable readers
- · Label design software
- · Wand/CCD/laser/mag stripe input The best warranty in the industry

Call for FREE catalog TimeKeeping Systems, Inc.

1306-C East 55th Street • Cleveland, OH 44103 (216) 361-9995 • Fax: (216) 361-0030

variant microsustems ...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 (in USA

CCD with Decoder & Bar Code Printing Software - \$485



CIRCLE 468 ON READER SERVICE CARD

BAR CODE HEADQUARTERS *T*ORTHINGTON

OFFICES IN USA AND EUROPE SOLUTIONS

LABELING SOFTWARE

QUALITY

. For Epson, Oki, IBM, and LaserJet.

SERVICE

- · Flexible design. Any Format or size.
- · On-Screen Label Design, WYSIWYG. 16 text sizes — 3"reads at 100
- I OGOS/Symbols · Bar codes: 2of5, 128, UPC/EAN, AIAG, MIL-STD, ZIP+4, and Code 39
- Auto-incrementing. File input. Logos, symbols from your scanner.
- · Reversals, color, soft fonts. Powerful, Versatile, Fast, Easy!
- · Rotatable, shadable, scalable fonts from .1" to 13" on Laseriet III
- Above label printed with LabelRIGHT™ \$279

果

- Sato, Zebra & Prodigy version LabelRIGHT Thermal \$479
- Other menu driven programs from \$129. SCO/UNIX \$199



BAR CODE READERS

for PC, XT, AT, PS/2, Mac and all RS-232 Terminals

- · Attaches as 2nd keyboard
- No software changes 2of5, UPC/EAN, 128,
- Codabar, MSI, Code 39
- Top Rated by Independent Review
- · Magstripe, laser, CCD, or wand input
- 1 or 2 input devices per reader
- 100 configurable options. Superior read rate.
- Complete with PSC or Symbol laser gun \$1389
- Complete with steel wand \$399



· Battery operated. Simple, Flexible, Powerful!

800 SUPPORT

- 64K 256K memory. Bar code or key input
- · Big Rubber Keys. Date/Time Stamping

PORTABLE READERS

- · Operates as Portable, Wedge, or Terminal
- · Built-in Generator for Easy Programming
- 2 Built-in Inventory Programs or 3 User Written
- · Upload Programs Furnished or use Xmodem
- 3 Data Files 3 Tables for Verification
- · Wand, CCD or Laser input
- Complete 64K units with wand \$799

Same Day Shipping! • Made in the USA • 2 Year Warranty on Wand and Decoder

FCC Class B an

European Office:

Rütistrasse 6 9050 Appenzell, Switzerland 71 87 51 15 • 71 87 51 17 Fax **USA Headquarters:**

3004 Mission Street, Suite 220 Santa Cruz, CA 95060 408-458-9938 • 408-458-9964 Fax

In Europe, Call Information for Toll-Free Number to Swiss Office

Worthington Data USA or Canada

30 Day Money Back Guarantee!



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 Province, Canada! Call for immediate coverage or information

1-800-848-3469

SAFEWARE The Insurance Agency Inc 2929 N. High St., PO Box 02211 Columbus, OH 43202 Local (614) 262-0559

DISKS

FORMATTED DISKETTES BASF, VERBATIM, SONY

WITH	QTY 250	WITHOUT
FORMAT	MIX & MATCH	FORMAT
\$.38	5.25" DS/DD	\$.33
\$.52	5.25" DS/HD	\$.42
\$.59	3.50" DS/DD	\$.49
\$.89	3.50" DS/HD	\$.79

- FREE FORMATTING on First Order
- TYVEC SLEEVES Included (5.25")
 COLORED MEDIA Please Add \$.05
 VOLUME DISCOUNTS Available
- SAME DAY Shipping MONEY BACK GUARANTEE

800-255-3142

Diversified Systems Group, Inc. PO Box 1114, Issaquah WA 98027

FACT: Each PC WORLD subscriber influenced software purchases of \$19,587 in 1991 alone.

DATA/DISK CONVERSION

CONVERTING YOUR DISKETTES?

ENTRUST THEM TO US 2500 Word Processor & Computer formats 3½", 5½", 8" DISKS, 3480, 8mm, Tk50, CARTRIDGES, MAGTAPES, MAGCARDS, CASSETTES,

DISK DUPLICATION **OCR SCANNING SERVICES**

Customized conversions too! Call us for quality, best prices and quickest turnaround time

COMPANY COMPENDIA, INC. (800) 374-DISK

or (312) 419-8771 FAX: (312) 419-1390

CIRCLE 490 ON READER SERVICE CARD

FACT: 23% of PC WORLD's subscribers purchased PC software from mail-order companies last year.

DATA CONVERSION

If you want the most complete conversion services in the (800) CONVER industry, just Capabilities include over

4000 formats **PIVAR** COMPUTING SERVICES, inc.

165 Arlington Heights Rd. #W Buffalo Grove, IL 60089 (708) 459-6010



CIRCLE 515 ON READER SERVICE CARD

DISK COPY SERVICE

MIRROR IMAGES MIRROR INIAGES

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

DUPLICATION FROM \$.49 HIGHEST QUALITY MEDIA

MSDOS duplication from \$.49 (5.25" and \$.80 (3.5"). Prices go even lower as you continue to order!

- Duplication + 100% Verification
- Custom Labels/Sleeves/Mailers Custom Packaging & Assembly Colored Media Available

- Special Rates For Demo Software & Site Licensing Educational Discounts Available
- 24 Hour Turn-Around Guaranteed Products

800-255-3142

Diversified Systems Group, Inc. O Box 1114, Issaquah WA 98027

Software Production

- Full packaging services
- **Duplication**, all formats
- **EVERLOCK** copy protection
- Label and sleeve printing
- 48 hour turn around
- Fulfillment and drop shipment
- Consultation and guidance

Star-Byte, Inc.

2880 Bergey Rd., Hatfield, PA 19440 800-243-1515

CIRCLE 422 ON READER SERVICE CARD CIRCLE 477 ON READER SERVICE CARD

SUPPLIES



Remanufactured cartridges for HP, Apple, etc. Exchange Price

7-8444 MC, COD VISA 800-

CIRCLE 429 ON READER SERVICE CARD

TONER RECHARGE

Quality Toner Cartridges New - Remanufactured - Recycled

· Apple, Canon, HP, IBM, etc.



· Prices Starting At \$25 · We Buy Empties - Call Quality Recharge Co. 105 Loughborough

FREE BROCHURE

1-800-238-2333

CIRCLE 404 ON READER SERVICE CARD

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.

Software

BUSINESS APPLICATIONS

J-Track Time & Material Billing

Software for the professional. Multi user/network ready. Tracks time & materials for jobs/contracts. Includes scheduling. Integrates with Accounting software developed by American Business Systems Inc. Call today for your free demo. Synergistic Systems Inc. 375 Morgan Lane #101, West Haven, CT 06516 800-466-7981, Fax 203-937-5451.

CIRCLE 414 ON READER SERVICE CARD

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. Only \$249, network \$449, Gtd UPS acceptance. 60-Day money back. Free trial offer. V-Technologies

P.O. Box 6261 Wolcott, CT 06716 (203) 879-6960

Fax (203) 879-6962

If You Ship UPS—Stop

handwriting addresses in your Log Book. Use our UPS accepted, full featured UPS Manifest System,

PSP-The Parcel Shipping Program. Prints manifests, shipping labels, CODs. Try (before you buy) for only \$15. If you decide to use PSP send us an additional \$110. Credit Cards accepted.

East Hampton Industries 81 Newtown Lane East Hampton, NY, 11937 800-645-1188, (516) 324-2224, Fax (516) 324-2248



Business cards instantly and easily.

CardsNOW for the IBM and laser printer- make professional looking business cards easily in just five minutes.

Never run out of cards again. New employees can make calls immediately.

Eliminates waiting and minimum orders.

Package comes complete with 25 art cuts, ten fonts and extra smooth edge card stock for 250 cards. Additional art cuts and card stock available.

We accept Mastercard, VISA and American Express.

To order CardsNOW call: 800-233-9767.



Madison, WI 53705-2159

MPCWD9306 1993, Topitzes & Associates, Inc

CIRCLE 421 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 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

B.S. & M.S In Computer Science

- ALL COURSES HOME STUDY
- Approved for tuition reimbursement by leading corporations
 - Increase your earning power
- Join students from leading computer companies
- C++ and Ada courses available.

AMERICAN INSTITUTE

For free information call 1-800-767-AICS

COMPUTER SCIENCES

LEARN COMPUTERS!



Home study. Be-come an expert per-sonal computer user for career advance-ment and personal

enjoyment. Learn at your own pace. Exciting and easy to follow. Send or call now for free career literature.

CALL TODAY: 800-223-4542

State

SCHOOL OF COMPUTER TRAINING

2245 Perimeter Park Dept. KG684, Atlanta, Georgia 30341

CIRCLE 451 ON READER SERVICE CARD

CHURCH SOFTWARE

Discover for yourself why more churches are choosing Power Church 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

DATA ENTRY

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

Advertising Age Reports:

PC WORLD's ad sales jumped 23.3% during last year's "recession".

Why? Because products sell when advertising in these pages. Every issue, every day, in good years and bad, PC WORLD works.

Contact Catalog sales today: 800/262-9885

eplace 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



SCS

PC from \$395 Also for LAN's IBM AS/400°*. IBM S/36

FREE VICE

206/776-6443 800/356-0203

FREE DEMO DISK AVAILABLE TO QUALIFIED COMPANIES!

SOUTHERN COMPUTER SYSTEMS, INC. (205) 251-2985 FAX (205) 322-4851 In UK: SCS Europe, Ltd 0753-36550/ FAX 0753 36765

THE DATA ENTRY EMULATO

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.

BW

Computer Keyes 21929 Makan Rd Woodway, WA 98020

Loan-Amortization

FINANCIAL

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

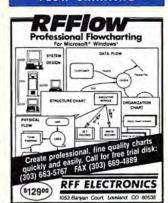
FORTRAN

Fortran Compilers

Whether you are developing new code or moving large mainframe programs to the PC, we have the Fortran Language Systems to meet your needs. Winners of PC Magazine's Editor's Choice and Technical Excellence Awards. LAHEY COMPUTER SYSTEMS

Box 6991 Incline Village, NV 89450 800-548-4778 or 702-831-2500 FAX: 702-831-8123

FLOW CHARTING



GRAPHICS Logo Desian



Software create world-class logos in minutes. There at 2,000 logo dexign elements, ALEPS format.

SuperPower 660 (660+ design elements)... Upgrade 500 (500 new design elements)... Upgrade 450 (450 more new elements).... Upgrade 400 (400 more new elements)....

Buy any module, or buy them all for just \$279.00. (Buy 1 now - buy rest in 30 days - get all for \$279) For the PC: Requires Corel Oraw, A&L; Micrografx, Illustrator, Freehand or similar program. To order, or for information, call

(800) 648-5646 Non Corp. = 4100 Executive Park Dr. Cincinnati, OH 45241 Phone (513) 421-1938

CIRCLE 417 ON READER SERVICE CARD

INVENTORY CONTROL/MANAGEMENT

RETAIL POINT OF SALE INVENTORY

Need Inventory Control?? Need Inventory Control??

Tired of doing things the hard way?
The POS has invoicing, reorder reports, on line stock search and browse, inventory updating, purchase orders Supports cash drawer, tape receipt printer, pen & laser barcode scanners

Accounts Receivables, Mailing List, Barcode Printing, General Ledger, Accounts Payables, UPS programs

Prices \$289 - \$489 - Network versions available

Easy to learn and use - Free technical support

Freeman Software Garland, Texas 800-426-6598 334 Fieldside Dr. 214-270-0625

CIRCLE 518 ON READER SERVICE CARD

Retail Point of Sale

Inventory Programs for Mail order Wholesalers Auto Parts Tire Dealer Package store Office supply

MEDICAL

Medical Systems with ECS

PPM offers a complt, line of med SW from simple ins. claims proc. to A/R mgt.

PC CLAIMS PLUS- claims proc. w/ECS to 100+ major ins. carriers -30 day MB guar

THRESHHOLD-complete A/R, Pt. Bill, Comprh. practice mgt stats. CLAIM NET- Nationwide eletrne claims clearinghse transmits to 100+ ins. carriers. SW starts at \$649. Dealer inquiries welcome Physicians Practice Management 350 E. New York Indianapolis, IN 46204

800/428-3515, 317/634-8080

Medical Billing Made Easy

Medsoft can handle your office NOW, and GROW with your practice. Over 1500 installations and 10 years experience means we are the experts.

- Medsoft's FoxPro Sierra Line offers:

 Custom versions: MEDICAL, DENTAL, ANESTHESIA, CLINICAL
- Flexible Used by All specialties
 Automatically Generates Insurance
- Electronic Claims

COMPETITIVELY PRICED

FREE Demo Disk. Dealers Welcome! Source code available. Pacific Medsoft, Inc.

P.O. Box 7049 (925 N. Lake Blvd, Suite B-301) Tahoe City, CA 96145-7049 800/343-5653, 916/583-2994. Fax 916/583-1532

MUSIC



Don't buy any PC MIDI products before trying the full-line from the industry leader. It's a risk-free way to learn about PC music. Apply the cost if you buy software from us. Vovetra Pelham, New York 10803 (914) 738-4500 Fax: (914) 738-4500 Fax: (914) 738-6946 Orders/Free Catalog:1-800-233-9377

CIRCLE 514 ON READER SERVICE CARD

MAILING PROGRAMS

Complete management system for a

catalog, inbound telemarketing, or

mail order company. Order process-

ing, inventory mgt, ad forecasting,

sales/banking, list mgt, modem charge approval, EDC, UPS mani-

fest w/scale interface. Single and

802 Madison Street, Dept. W593

800/782-8278, 708/869-3434

bound Editor's choice.

Haven Corporation

Evanston, IL 60202

Multi User Systems. Inbound/Out-

The Mail Order Wizard

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

MAIL ORDER

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 Multiuser 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

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

408/997-7703, FAX: 408/927-0570

San Jose, CA 95160

800/521-0545

ONLINE SERVICE

Where Adults Come To Play



Join The Thousands Of Ladies And Gents Around The World Who Have Discovered America's Leader In Online Adult Entertainment Where YOU Create The Fun! And It's Only On Odyssey!

For Modem Info, Signup Or A Local 818 358-6968 Number From Over 850 Cities Call:

CIRCLE 411 ON READER SERVICE CARD

PUBLIC DOMAIN/ SHAREWARE

KIDS • FONTS • GAMES **CLIP ART • WINDOWS HOME and BUSINESS**

On 3/3.5° or 5/5.25° disks. Pay a service charge of \$2.95 per collection. Credit card only.

Software of the Month Club Satisfaction Guaranteed Since 1985

619-931-8111 Ext 511

CIRCLE 412 ON READER SERVICE CARD



CIRCLE 402 ON READER SERVICE CARD



OUTSTANDING SOFTWARE YOU CAN ROAD TES

AT NO CHARGE !

FREE

TECHNICAL

MAIH TUTOR FONTS GENEALOGY CHILDRENS EDUCATION CUP ART LOTUS 132 CLONE PO-FILE V6.5 DOS TUTORS STOCK CHAPTING SCREEN SAVERS FLOWCHAPTER GAMES WINDOWS AUTOMENU WORDPERFECT TUTORS UTILITIES SCREEN SAVES FLOWCHARTEN
GAMES WINDOWS AUTOMENU
PC-WRITE PC-KEY DRAW SOLVEIT
WORDPERFECT TUTORS UTILITIES
UNCONDITIONAL MONEY BACK GUARANTEE

1-800-800-3122

CIRCLE 500 ON READER SERVICE CARD



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 600BM Hatfield, PA 19440 . (215) 997-2470

CIRCLE 405 ON READER SERVICE CARD



SOFTSHOPPE, INC. P.O. Box 247 ARTESIA, CA 90701 Tel: (714) 261-0114 FAX: (310) 802-1494

Toll-Free-24 Hrs. 1-800-851-8089

CIRCLE 512 ON READER SERVICE CARD

POINT OF SALE

RoundTable Restaurant

POINT-OF-SALE SOFTWARE. Improves Profits & Communications; Quick to Install & Learn. Runs on any compatible PC or Motorola 8120 RISC UNIX server. Reseller inquiries welcomed. \$495/base copy \$295/ea. addt'l NW copy; 30-day Money Back Guarantee. Working Demo Disk available \$20. ADVANTA Technologies One West Loop South, Suite 801 Houston, TX 77027 (800) 324-2388

The "Mail Order Master" Software Program contains all the

routines you need to run your Home or Office mail order business. Easy to use features include Powerful Database, Invoicing, Inventory Control, UPS Manifesting, Sales & Income Report, Sales Tax Report, Product Sales & Profit Report, Statements, Credit Card Voucher Printout, Bulk Mail Sort, plus lots more, IBM compatible. Single User System. Hands-On Demo \$20.00. The Marshall Weiner Corp. 1700 Catalina Ave. Seal Beach, CA 90740 800/874-4656 USA & Canada

REAL ESTATE

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

Property Management

Comprehensive software for managing residential, commercial, condos & more. Three versions: Basic PM for owner/manager-\$495, Deluxe PM for professional man-agement-\$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

Electronic Privacy

PCCrypto™ enciphers any DOS

file for absolute privacy by using

the One Time Pad algorithm - the

only unbreakable cryptosystem.

money back guar. Send \$59

more info!

P.O. Box 22508

check/MO per set + \$2 S&H

DataSafe Computing, Dept B

Alexandria, VA 22304-9998

(+\$2.66 tax in VA). Or write for

Menu driven, on-line context sensi-

tive help. Sold in sets of two. 30 day

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. 3814 Lyndale Ave. S., Mpls., MN

55409

Tel: (612) 822-8252

The Survey System

Analyzes: marketing, public opinion, customer satisfaction, employee attitude surveys. Handles mail, personal, phone, scanner, disk-by-mail or computer interviews. Records verbatim text and actual voice answers. Graphics, network version, user friendly. Free support. Creative Research Systems 15 Lone Oak Ctr., Dept W Petaluma, CA 94952 Ph (707)765-1001 Fax (707)765-1068

SECURITY



FIGHT PIRACY PROTECT YOUR SOFTWARE

Since 1986 thousands of companies worldwide have chosen Az-Tech Software as partners in their fight against

Software Pirates. Why? Because Az-Tech offers you:

EVERLOCK 3.0

- OPTION BOARD SAFE CPU LOCK REMOTE REGISTRATION CD ROM LOCK WINDOWS COMPATIBLE

EVERKEY LOCKS

Call Today For A FREE DEMO 1-800-227-0644

Az-Tech Software, Inc. 201 East Franklin Richmond, MO 64085 (816) 776-2700 FAX (816) 776-8398

CIRCLE 403 ON READER SERVICE CARD

FACT:

ADD RED As A SECOND COLOR. NCREASE RESPONSE By 41%.

WHAT'S UP AT PC WORLD?

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 CadKey Topas MasterCam MicroStation Rio & others

From \$399 plus S&H (609) 390-2799

V/SA Fax: (609) 390-3750



IMAGINE THAT

One Evergreen, Seaville, NJ 08230

CIRCLE 486 ON READER SERVICE CARD

SCHOOL APPLICATIONS

School Partner

FACT: THIS SYSTEM COSTS A FRACTION OF LESSER SYSTEMS, and DOES MORE! OUR SYSTEM CAPABILITIES INCLUDE:

- · Teacher & Student Medical Records
- · Classes, Rosters, Attendance
- · Billing & Receivables
- · General Ledger, Payables, Payroll · And More

FOR: IBM Compatibles and

Networks We offer ongoing Technical Support, and openly share ideas. Summit Systems, Inc. 16 Berry Hill Rd, #121 Columbia, SC 29210 USA Fax 803-731-0349

Phone 800-228-5957 803-798-9749

CIRCULATION

√ Rate Base 901.000 - an increase of 281,000

√ Newsstand up 28%

READER RESPONSE

√ Over 1,000,000 Reader responses to ads in PC WORLD last year.

EDITORIAL PAGES

- √ More editorial pages covering more products for managers.
- √ Focused on manager's needs: how to plan, buy and use.

ADVERTISING PAGES

- √ Up 12% year-to-date.
- √ More advertisers are investing more ad pages in PC WORLD than ever before.

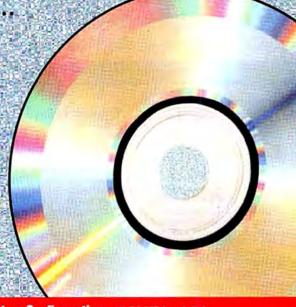
MORE MANAGERS THAN EVER

- √ 74% of subscribers are managers proficient with PCs.
- $\sqrt{646,000}$ unduplicated management readers.

INTRODUCING A NEW INTERACTIVE CD

Experience the exciting world of Multimedia at your own pace. Its power, capabilities, and potential. The Guided Tour of Multimedia lets you interactively explore:

- The Technical Fundamentals of Multimedia
- Hardware/Software Needs and Capabilities
- How to Create Multimedia Presentations
- Vast Clip Libraries of Graphics, Sound, Video
- Interactive Table of Contents, Glossary, Index



Minimum System Configuration: ■ 30 MB hard disk

PC 386SX or better

VGA display, 256 colors

■ Windows 3.1 or 3.0 w/Extensions ■ 2 MB RAM, 4 MB recommended

CD-ROM Drive

■ Sound board (optional)





VIDEO Capture/playback video



SOUND Add music & voice-over



ANHVATION makes your work fly





The Guided Tour of Multimedia comes complete with the Multimedia Roadmap book, which contains many valuable discount coupons where you can save hundreds of dollars on multimedia products from such leading manufacturers as-

The Guided Tour of Multimedia is a complete interactive resource for both beginners and professionals. This powerful CD, which has over 20 hours of content, has been compiled and developed by a team of world-renowned experts in the field

ASYMETRIX, CALCOMP, COMPTON'S NEWMEDIA, GOLD DISK, IBM, IDG/ETA, MACROMEDIA, MEDIA VISION, MICROTEK, SONY

To experience all the wonders of Multimedia, call 1-800-942-4000 This exciting product is available for \$49.95 plus applicable taxes and \$3.50 for shipping and 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

PC WORLD

PUBLISHER Richard J. Marino Assistant to the Publisher Colette Cornish

ADVERTISING SALES

Senior Vice President, National Accounts Director Bernard J. Theobald, Jr.

Assistant to the Senior Vice President Patricia Owen

Vice President, Director of Advertising Jeff Edman

Assistant to the Director of Advertising Kate Comfort Harr

EAST

Eastern Advertising Director Bob Ostrow (508/820-0440)

Administrative Assistant Ellen Sanderson

Mid-Atlantic/Manhattan John Grogan, Senior Account Manager (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)

East Michael Harwayne, Account Representative (210/587-0900)

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)

Duane Hampson, Account Representative (415/243-0500)

NORTHWEST Northwestern Advertising Director Bob Carrigan (415/243-0500)

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/Orange County) M. William Hanck.

Account Manager (714/250-8081)

Southern California/Colorado/ New Mexico/Utah/Idaho Lisa Crutchtield, Account Manager (714/250-8081)

Los Angeles, California/Arizona Neil Ferree,

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 CATALOG

(800/262-9885)
Catalog Manager Pat Fales
Eastern Account Manager Chris Kimball
Western Account Manager Dean Lucente
Coordinator Sally Naylor

PC WORLD ACTION CARDS

Account Representatives Kevin Normandeau (508/820-8113) Leslie Piper (415/243-0500)

CIRCULATION, MARKETING, RESEARCH

Senior Vice President Heather Martin Majer

Assistant to the Senior Vice President Anna Mercaldi

Subscription Director David Ball

Senior Promotion Manager Francesca Davies

Circulation Business Manager Noël White

Promotion Manager Ellen DiMatteo

Promotion Coordinator Jane Kratochvil

Renewal and Billing Coordinator David Cobb

Circulation Assistant Katherine McCarthy Subscriber Service Charles T. Powell, III Single Copy Sales Kemco Publishers Services (603/924-0224)

Marketing Manager Alan Abrams
Public Relations Manager Lec Doyle
Reprints Coordinator Scott Shores
Marketing Coordinator Sandy Wong
Administrative Assistant Krista Alvarez

Research Director Cheryl Curbow Research Manager Thomas Gewecke

PRODUCTION

Vice President, Manufacturing Linda Manes Goodwin

Senior Production Manager Nadia Maudsley

Advertising Information Manager Kevin Octavio

Assistant Production Manager Karhy Badertscher

Advertising Production Coordinator Paul O'Neil

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 Informat on Services Walter J. Clegg

Corporate Business Manager Christina Spence

Accounting/Operations Manager
Par Murphy

Accounting/Facilities Manager Michelle Reyes

Senior Financial Analyst Madeleine Buckingham

Special Assistants to the President Thomas Hsieh, Jr., Scott Laughlin

Assistant to the President Kelly Milan

Advertiser Index A-Z

Reader

Get more information—circle the appropriate number on the reader service card.

Num	nber	Number
	Acer	
66	Acma Computers, Inc	94
	Advanced Logic Research	11
207	America Online 25	1,261-262
89	Advanced Micro Devices	253
45	American Power Conversion	49
1	American Small Business Computers	218
-	Anthro Corp	
8	Arlington Computer Product	
-	AST Research	26-27
5	The state of the s	
95	Bay Technical Associates	22
63	The second secon	
17	Caere Corp	235
	Canon	
52	Central Point Software	. 112-113
53	Claris	52-53
83	Compaq	12-17
47	Compaq	. 167-174
	CompuDyne	
33	CompuServe	243
26	Computer Associates	219A
78	Computer Associates	219В
39	Computer Associates	
68	Computer Discount Warehouse	. 285-287
4	Computerworld	
92	Corel Systems Corp	
-	Corris	30
10	Dec Direct	
2		
-		
14	Dell Computer Corp	C5-C8
-		
U	Epson	82-83
1	Epson	
82	ExecuTrain	223
100		
235	Fifth Generation	18
73	First Source International	292
	Fujitsu Computer Products	
	Gateway 20(X)	
÷	Contract to the second contract of the second	

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 190 computer publications in 60 countries. Thirty million people read one or more International Data Group publishes 190 computerworld Malaysia, Computerworld Malaysia, Computerworld Malaysia, Computerworld Subject (Computerworld Malaysia), PC World Mong Kong, PC World Malaysia, PC World Mong Kong, PC World Mong Kong, PC World Mong Kong, PC World Mong Kong, PC World Mong Mong, PC World Mong, PC Wor

Index

Reader Service Number	Page Number	Reader Service Number	Page	Read Servi Num	lce Page	Rea Serv Num	rice	Page Number
- Graphix Zo	one	224 \	/alitek		Local Area Networks		Integrate	d Software
	Software Ltd 296B		Vestern Telematic	198	Protec Microsystems, Inc	53		52-53
90 Helix Softs	vare	- 1	VordPerfect122-123		Rose Electronics			
102 Hewlett P:	ckard71	238 \	Vorldwide Technologies 288		Western Telematic	-	Managem	
- IBM Corp.	115-118	258 2	Zeos International 4-7		Monitors	90		rare175
162 IBM Perso		260 2	Zeos International 8-9	400	J1777		Multimed	la
	249				In Focus Systems	107	Intel Corp	90-91
	s299A-299B		4 4 4		NEC Technologies C2-P1 nView Corp	246	Sumeria	295
	ystems	Adve	ertiser Index by		Sampo		Operating	Systems
	nputers 200-201		luct Category	200		_		
					Peripheral/Sharing Devices			k237
			ore information—circle the appropri-		Bay Technical Associates		Presentat	tion Graphics
	er298	ate ni	imber on the reader service card.		Microsoft108-109			40-41
	Inc 290-291		IARDWARE		Protec Microsystems, Inc			t122-123
The second secon	20-21				Rose Electronics			
	40-41		Boards/Cards/Chips	250	Western Telematic232		A	anagement
- Lotus	141-143	89 /	Advanced Micro Devices 253		Power Protection		and the second second	Associates219B
165 MEI/Micr	o Center	5 /	ATT Technologies39		American Power Conversion 49			Software Ltd 296B
217 Merritt Co	mputer Products 234		Communications/Fax/	-	Curtis30			211
- Microsoft.			Modems		Printers	233	Patton & Pa	atton294
 Microsoft. 	76-77	249 5	Supra Corp25	95	Bay Technical Associates		Spreadsh	eets
 Microsoft. 	108-109	154 l	J.S. Robotics, Inc 263	50	Canon	-	Lotus	20-21
			Computers	- 4	Epson	-	Microsoft	76-77
		3 /	Acer	100	Fargo Electronics, Inc		Statistics	
	196-197	66 /	Acma Computers, Inc 94	156	LaserMaster	253	SPSS.Inc.	29
	211	9 /	Advanced Logic Research11	199	Okidata121		Utilities	
	ions24	- 1	AST Research	-	Pacific Data Products 92	- 23	24000	
	outer Systems 282	83 (Compaq	184	QMS227			nt Software 112-113
	nologies	47 (Compaq 167-174		Tektronix, Inc247			ckard71
	nologies164-165	14 (CompuDyne	242	Texas Instruments			256
- Northgate	c160		Dec Direct		Scanners			
			Dell Computer Corp 146-147	50	Canon			231
	p		Dell Computer Corp	139	NISCA, Inc	-		
199 Okidata	121		Gateway 2000		Storage Devices		Windows	
222 One-Write	Plus		Gateway 200085-88	153	Fujitsu Computer Products 264			
 Pacific Dat 	a Products 92		BM Corp		MicroSolutions24			rask Force99
	atton294		Products249		Valitek242	102		
	ction 150-159	131 1	nsight Computers 200-201		Systems		Word Prod	cessing
The second second second	299	172	MIS Computer Systems 282		Edition to the second second			141-143
	Online 251,261-262	203	NEC Technologies 164-165	_	Dell Computer Corp C5-C8	-	Microsoft.	
	256	- 1	Northgate Computer		SOFTWARE		MISCELL	ANFOUS
	n Task Force99		Systems		Accounting/Financial			
	rosystems, Inc		USA Flex	222	One-Write Plus		Books/Pe	
	296A				Time Solutions			world,
	k237		nput Devices	1/3		-	IDG Books	299A-299B
	ronics		Epson 82-83		CAD/CAM		Computer	Accessories
	229		Key Tronic 107	1	American Small Business		Anthro Con	p34
		- 1	Microsoft108-109		Computers218	8	Arlington C	computer Products, 289
	Network	- 1	aptops/Notebooks		Database Management	217	Merritt Con	nputer Products 234
253 SPSS, Inc.	29	14 (CompuDyne		Computer Associates219A		Mall Orde	r
	295		Dell Computer Corp51		Computer Associates219C	47		
249 Supra Corp	25	- (Gateway 200085-88	63	Borland International 245		Computer I	
252 Symantee	231		MEI/Micro Center73		Desktop Publishing		Warehouse	
124 Tektronix,	Inc247		NISCA, Inc	17	Cacre Corp235			International 292
244 Texas Instr	uments 239		Northgate Computer	225	Serif, Inc			283
	uments 255		Systems		Graphics			uter Systems 282
	tions 125		l'oshiba	1	American Small Business			tion 150-159
	192-193		Zeos International		Computers218			284
	ies, Inc	200 /	2000 FIRST INTRODUCTOR 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	92	Corel Systems Corp257	238	Worldwide'	Technologies288
148 USA Flex	284							

Index

Reader Service Number	Page Number	Reader Service Number	Page Number	Reader Service Number	Page Number	Reader Service Number	Page Number
Online Services		680 Diamond DT 48	6DLC/40,	645 MXL-105-III, Ma	ixtor72	659 Tripp Lite BC-	100, Tripp Lite 84
207 America Online	251,261-262		ologies111	E-mail		Presentation	Carlo Corre
33 CompuServe	243	681 First Computer F	CS 486SX-33,114	729 cc:Mail for Window	us 2 0		oftware
- Dow Jones		682 Gateway 2000 4S	X-25,		nt54	Printer	itware46
207 PC World Online . 191 The Sierra Network	the state of the s	726 Hewlett-Packard		Entertainment/	'Game	658 Epson Stylus 80	00.
	18		48	600 Contraption Zack,			84
Services - Microsoft	176-177	683 Insight 486-33 M Insight Compute	Hz ValueLine,	601 David Leadbetter! MicroProse Softwa	s Greens,	728 Hewlett-Packar Hewlett-Packar	rd LaserJet 4L,
Trade Shows		684 Keydata 486SX/2		602 Links 386 PRO, Access Software	297	Project Mana	igement
- Graphix Zone		685 Micro Express M	E 486DLC/40,	603 Underworld II-Lah Origin	pyrinth of Worlds,	712 Guide Line, Gr Symantee	iide Line Maker,
- PCExpo	299	686 MIS 425SX, Micro		Image Editing		Shareware	
Training	222		ms119	647 Adobe Photoshop	2.5 for Windows.	639 Stress Free,	100
82 ExecuTrain 206 LearnKey, Inc		687 Netis N425VL, Netis Technology	/120	Adobe Systems	74		vare
		644 New 486 System	s, Packard Bell 72	LAN Operating		Spreadsheet	
Products Feature	ed	688 Packard Bell PB4 Packard Bell	25/8,120	654 LANustic 5.0, Arti Mail Order	soft	713 Improv for Win	
in Editorial	7.	689 Polywell Poly 486		670 Acma 486SX-33 VI	ECA Asses 105	Street, Street	ment293
		690 Quill Otech PCS	4925	671 ALR Flyer SD 4/25	The first of the second	Spreadsheet	-0.11 P
Get more information—c ate number on the read	of the first country for after the	Quill Computer I	Products 124	ΛLR	105	657 Forecast for Exe Intex Solutions.	œl,
		691 Silicon Valley SVO II, Silicon Valley	The state of the s	ATronics AT1-4868		606 The Judd Test: Mentrix	Lotus 1-2-3,
Add-On Board		692 Tandy 425 SX, Ra	ndio Shuelt 126	674 ATS 486-33, ATS C		User Group	111111111111111111111111111111111111111
662 Diamond Stealth F	ProVLB.	693 USA Flex 486SX		676 Blackship BLK 486 ship Computer Sys		621 Greater Clevela	and PC Users Group
Viper VLB; Diamo	ond Computer		126	679 Dell 425s/L, Dell	111	Dan Hanson	221
626 FastCache 64, Con	porite	641 WinBook, Micro		680 Diamond DT 4861 Diamond Technology		Utility	
Systems Center	216	894 Xinetron X/LAN Xinetron		681 First Computer FC		622 386Max, Qualit	as 222
655 Kingston DataCard Kingston Technolo	d, ogy84	Database Man	agement	First Computer	114		Aldridge Co 216
664 Matrox MGA Impo		608 AceFile 2.0, Ace 5	Software 198	682 Gateway 2000 4SX Gateway 2000			Publishing216 are Matters216
	89	609 Approach for Win		683 Insight 486-33 MH	z ValueLine,), HyperWare 216
625 Model S425I, Alph 627 QuickCache, Wins		653 askSam for Windo	re198	Insight Computers			indows, Lucid 216
	ns216		79	684 Keydata 486SX/25 Keydata		620 LJVGA, Ares To	echnologies220
628 Ultra 15C, UltraSto		610 DataEase Expres DataEase Int'1	s for Windows 1.0,	685 Micro Express ME Micro Express		638 Norton Utilities Symantee	6.01 NCache, 216
Backup Softwar		660 DataPerfect 2.3 fo	or DOS,	686 MIS425SX, Micro	Niche	631 PC Tools 8.0 PC	
656 Flexibak Plus, Dys	an Int'l84	607 FileMakerProfo	Windows 2.0, Claris	Information System 687 Netis N425VL.	ns 119	623 QEMM-386,	oftware216
643 RCD-202, RCD-2	00-	198	114	Netis Technology .	120		flice Systems222
	70	612 Microsoft Access Microsoft	1.0,	689 Polywell Poly 486- Polywell Compute		665 Searcher 3.0 for Professional 2.0	Windows, Searcher Cognitronix89
Computer Syste		611 Paradox for Wind Borland Int'l	ows 1.0,	690 Quill Qtech PCS-4 Quill Computer Pro		636 Super PC-Kwik PC-Kwik	5.01,
715 486/SX Dual Scan (LeaderBook Pro. P	Color C Brand 293	613 SuperBase 2.0 for	Windows,	693 USA Flex 486SX/2			, Microf Jelp 300
670 Acma 486SX-33 VI			ng202	USA Flex	126	722 Uninstall for Wi	
671 ALR Flyer SD 4/23 Model 80DW, ALI	5s R105	Database Utili 663 FileMaker Pro'Tr	S	694 Xinetron X/LANS Xinetron		632 Veache 6.00,	
672 AST Bravo 4/25s.				Mapping Softwa	are	Golden Bow Sy 635 Windows 3.1 Sn	stems
AST Research	X/33.	Desktop Publis	shing	661 Atlas GIS, Atlas Pro MapMaker; Strates		Microsoft	216
		719 Express Publishe Power Up Softwa	r for Windows 1.0,	648 Maps&Data, Mapl	11 10	724 WUGNET, Wi Group Network	ndows User
675 Auva 486DX/50 M		721 Microsoft Publish	er 1.0,	Miscellaneous		Word Process	sing
		650 PagePlus 2.0 for V		714 Office Layout 1.0, / Retail Products		716 Ami Pro 3.0,	mant 179
	stems110	720 Publish It for Win		Multimedia Sof		717 Microsoft Word	
677 CAF Gold 3D, CAF Technology	110	Development T		651 Compel 1.0, Asymo	Control of the Contro	718 WordPerfect 5.2	2 for Windows,
642 CompuAdd 450SL	C2, auter	649 Microsoft Visual C	D++ 1.0.	Personal Inform	ation Manager		178
640 Contenda, Zeos In		Microsoft	75	652 PackRat 5.0, Polaris	Software 79		
678 CUI Advantage 48	6/25SX,	Disk Drive		Power Supply			
	110	646 MiniPort 42/85, MiniStor Periphe	rals	725 Minuteman Alliano			
679 Dell 425s/L, Dell.		Minimum r cripne	MARCO STATE V C11 / 6	A425; Minuteman.	84		



Local Bus	X Ready		MPC Ready		Novell Ready		UNIX Ready		CAD Ready	1	Work Stations
80486DX2-66	80486DX2-66		80486SX-25	٠	80486DX2-66	٠	80486DX2-66		80486-33		80486DX2-50
VESA IDE	X Emulation		Upgradable	•	EISA Ethernet		16 Port EISA		VESA IDE		Ethernet
64K Cache	64K Cache		MPC Kit		64K Cache	•	64K Cache		64K Cache		64K Cache
4MB SIMM	4MB SIMM		4MB SIMM		16MB SIMM		32MB SIMM		8MB SIMM		4MB SIMM
120MB IDE	Ethernet	•	120MB IDE		660MB SCSI		1.2GB SCSI		120MB IDE		120MB IDE
1.2 & 1.44 Floppy	1.44 Floppy		1.2 & 1.44 Floppy		1.2 & 1.44 Floppy	•	1.2 & 1.44 Floppy		1.2 & 1.44 Floppy	•	1.44 Floppy
VESA VGA	VESA VGA		1MB VGA		256K VGA		256K VGA	•	VESA VGA	•	1MB VGA
14" NI VGA	17" NI VGA		14" NI VGA	•	14" Mono VGA		14" Mono VGA		20" NI VGA		14" NI VGA
101-Key KB	101-Key KB		101-Key KB	٠	101-Key KB		101-Key KB		101-Key KB		101-Key KB
Mouse	Mouse		Mouse	•	Mouse		Mouse	٠	Mouse		Mouse
DOS 5.0	DOS 5.0		DOS 5.0	•	DOS 5.0		DOS 5.0		DOS 5.0		DOS 5.0
Windows	Windows		Windows		Windows		Windows		Windows		Windows
Desktop	Desktop		Desktop	•	Tower		Tower	•	Tower		Desktop
\$2,695	\$3,695		\$2,095		\$4,695		\$6,695		\$4,895		\$2,195

MIS Computer Systems is proud to <u>enter its fifth year providing high end</u>, <u>quality systems</u> to <u>intelligent buyers</u> who are looking for <u>value</u> as opposed to the lowest possible price. The purchase of a computer system is an investment and the phrase, "<u>You get what you pay for</u>", has never been more appropriately applied than it is today in the computer industry. Give us a call right now to learn how little <u>VALUE</u> can cost.





Please call 800-733-9188

to order and for other configurations.

935 Benecia Avenue
Sunnyvale, CA 94086
FAX: (408)730-5933

MADE IN THE U.S.A.

** CALL TOLL-FREE 800-433-3726 **

** CO-PROCESSOR SALE ** INTEL 80387, 165X or 16DX: 59.00 each

INTEL 80287XL, Doesó, 8, 10, 12 MHz: 74.00
INTEL 80287XD Doesí 6, 20, 25, 33 MHz: 89.00
INTEL 80387SL for SL Based NTBKS: 89.00
CYRIX 83D87-40MHz for 40 MHz: 109.00

HP LASER 4 MEMORY 2Meg - **80.00** 4Meg - **149.00**

8Meg - 309.00
"We buy large volume of excess inventory."

Individual D-RAM Chips

INTEL Math Chips

MEM	ADV EAR	I IBM &	ADDIE			
1Megx1 1Megx4 1Megx4	60NS 4.75 24.00 25.00	70NS 4.50 20.00 21.00	80NS 4.25 18.00 19.00	100NS	8087 8087-2 8087-1 80287-XL 80387-16 DX	49.0 69.0 89.0 74.0 59.0
(Zip Pack) 256 x 4 (Video Zip)		0	15.95	12.55	80387-20 DX 80387-DX (Does All)	65.0 89.0
256x4 256 x 1 64x4 64x1	4.75 3.00	4.50 2.60	2.20 3.00	2.00	Intel SX (Does All) Intel St Mobil Intel 16SX	89.0 89.0 59.0

SIMM MODULES (Add \$5.00 for SIPP)

	40NS	53NS	60NS	70NS	BONS	100NS
1Meg x 9	69.00	54.00	38.00	37.00	36.00	34.00
4Meg x 9	-	-	164.00	139.00	134.00	-
16Meg x 9	-	- 1	-	749.00	-	-
16Meg x 9 (9 chip)	100	-	-	1239.00	-	-
16Meg x 9 (36 chip)	-	-	100	699.00	·	A
256 x 9	40	-	20.00	19.00	18.00	17.00
256 x 35 1Meg (72 PIN)	EISA	-			50.00	-
512 x 35 2Meg (72 PIN)	EISA	-		85.00	60.00	-
1 x 36 4Meg (72 PIN)	EISA	-	169.00	159.00	149.00	-
2 x 36 8Meg (72 PIN)	EISA	-	309.00	299.00	299.00	+ 11
4 x 36 16Meg (72 PIN)	EISA	-	619.00	609.00	599.00	-
8 x 36 32Meg (72 PIN)	EISA	-	. 4	1475.00	1450.00	100
15 x 36 (64Meg)	-	-	-	5900.00		-

CYRIX FASMATH PROCESSOR

AST MEMORY MODULES

MODEL	AMT, UPGRADED	AST PART #	PRICE
Advantage 12-386	4Meg Kit	500510-004	Call
Bravo 486/25, 33	2Meg Kit	500780-005	120.00
	8Meg Kit	500780-001	298.00
Bravo 488	2Meg Kit	500987-001	99.00
	4Meg	500987-002	159.00
	SMeg Kit	500987-003	318.00
	16Meg	500987-004	599.00
	32Meg Kit	500987-005	1200.00
Premium 386/25, 16 SX	1Meg	500718-001	55.00
Premium 386/33	1Meg	500718-002	56.00
Premium II	1Meg	500780-003	WPB 60.00
386SX20, 486-25, 25E, 3		500780-004	WPB 149.00
Premium Tower, 386/33TE 486/25TE, 486/33TE	5Meg	500780-001	WPB 298.00
Cupid Memory Board	0-32Meg	500818-001	Call

ZENITH MEMORY MODULES

	UPGRADED	AST PART #		PRI
7386/33, 25, 20, 33E	1Meg	ZA3800ME	modules	50.
Z386/33, 25, 20, 33E, 486/25E	4Meg	ZA3800MK		149.
Z386SX	2Meg	Z-605-1		99.

MAGNAVOX

Z66/3865X-16, 3865X-20, 4865X-20 & 386-33 all are TZPIN SIMM: 1MEG – 50.00 4MEG – 149.00 BMEG – 309.0016 BIT DELL

420, 425, 433, 450, DE, SE, TE 2/4Meg Kit - 129.00/199.00 8/16 Meg - 319.00/619.00 32 Meg - 1399.00 Call on other Dell Machines

MEMORY BOARDS

BOCA AT PLUS

16 BIT NEMORY BD. FOR 286, 386 AT + 0K-6Meg Bd. 4.0 LIM Compat. • New 5 Yr. Warr. Convent., Expnd. & Extnd. Memory + Supports DoS, 05/2, LIM/EMS & EBMS • Versable Split Memory Addressing - Operates w/CPU Speeds to 33 MHz - Supports Desynew, Muthats Aperations - 86. made by 80ca Research, AT plux 0K - \$99.00 2Meg - \$159.00 4Meg - \$249.00 8Meg - \$379.00

BOCA XT 8 BIT BUS

IBM P/S2 32BIT EXPANSION BD.

0-32Meq, Ext.-Expod. Memory Bd. for P/S2 70, 80, 90, Lim 4.0 OMeg 2Meg 4Meg 8Meg 16Meg 32Meg \$179.00 \$258.00 \$328.00 \$477.00 \$799.00 \$1.499.00

PS/2 MCA 0-8MEG EXPANSION BD.

0-6Meg Extended and/or Expanded Memory for all IBM P/S2 Models 50, 502, 60, 555X, 655X, 16 Bit, 4.0 LIM Compat. 0K - 119.00 2Meg - 190.00 4Meg - 255.00 8Meg - 410.00



IBM PS/2 SIMM MODULES

ISM PART NO.	WORKS WITH MODEL NO.	PRICE
30F5348 (512K)	30-286 30-286, 25-286, 50 MTHR BD	30.00
30F5360 (2Meg) 33G9288 (2Meg)	30-286, 25-286, 50 MTHR BU Thinkpad 300.	85.00 109.00
33G9288 (8Meg)	Thinkpad 300.	399.00
6450375 (1Meg)	80-041	79.00
6450379 (2Meg)	80-111, 311-121, 321, 061, 161	99.00
6451060 (4Meg)	80-A21, A-61, 80-A31, 80-111, 80-311	199.00
6450603 (1Meg)	35SX, 40SX, 55SX, Model-70's, P-70	54.00
6450604 (2Meg)	70-061, E61, 121, 50Z, 55SX, 65SX, P-70.	77.00
Ginada's (Fillion)	55LS, 65LS, X-Station 120 & 130, 35SX, 35LS, 40SX	67.00
6450608 (2Meg)	70-A21, A-61, B-21, B-61, 35SX, 35LS, 40SX	84.00
******	Value Point 325T	33.45
78X8955 (128K)	25	35.00
34F2933 (4Meg)	35SX, 40SX, 55SX, 65SX, 55LS, 65LS	149.00
87F9977 (4Meg)	55SX, 55LS, 65SX, 40SX, 35SX, 35LS	149 00
1057035 (512K)	P/S1-286	40.00
92F9935 (2Meg)	P/S1 & P/S1/386SX-2121	84.00
92F9694 (4Meg)	P/S1 & P/S1/386SX, Model-2121	149.00
6450902 (2Meg)	56, 57, 57SX,90, 95, P-75, 57SLC	89.00
CATALOR (Allen)	Value Point 77 486DX2, 486SX, SVR 85	140.00
6450128 (4Meg)	57SX, 90, 95, P-75, 57SLC, 56, 56SLC, P/S1, 386SX, Models-2123, 2133, 2155	149.00
	Value Point 77 4860X2, 4865X, SVR 85	
6450129 (8Meg)	35SX, 40SX	299.00
6450130 (8Meg)	56, 57, 57SX, 90, 95, P-75, 57SLC	299.00
and the founds	Value Point 77 486DX2, 486SX, SVR 85	233.00
79F0999 (2Meg)	LX40, N33SX, PS Note	99.00
79F1000 (4Meg)	LX40, N33SX, PS Note	159.00
79F1001 (8Meg)	LX40, N33SX, PS Note	299.00
07G1826 (2Meg)	N51 (all)	99.00
07G1827 (4Meg)	NS1 (ati)	169.00
07G1828 (8Meg)	N51 (all)	309.00
07G1419 (2Meg)	CL57LSX Color LpTp, Thinkpad 700, 700C	169.00
07G1420 (4Meg)	CL57LSX Color LpTp, Thinkpad 700, 700C	219.00
07G1421 (8Meg)	CL57LSX Cofor LpTp, Thinkpad 700, 700C	359.00
92F8804 (2Men)	WASSI	99.00

COMPAQ MEMORY MODULES

MODEL	AMT. UPGRADED	CMPO PART	PRICE
DeskPro 386/33, 386/33L	2Meg Module	115144-001	99.00
486/25, 486/33L	8Meg Module	116561-001	289 00
486/50L, System Pro	32Meg Module	116568-001	1500.00
DeskPro 386/33L, 486/33L	(Exp 8d)	116569-001	299.00
DeskPro 386/25, 386/20	1Meg Module	113131-001	79.00
A 11-17 - 17-18-18-18-18-18-18-18-18-18-18-18-18-18-	4Meg Module	113132-001	174.00
DeskPro 386S-16MHz	1Meg Exp Bd	113633-001	110.00
DESKI 10 3003 1011112	4Meg Exp Bd	113634-001	219.00
	1Meg Module	113646-001	75.00
	4Meg Module	112534-001	174.00
DeskPro 386/20E	1Meg Exp Bd	113644-001	119.00
DeskPro 386/25E	4Meg Exp Bd	113645-001	219 00
Destrio Sociale	1Meg Module	113131-001	75.00
	4Meg Module	113132-001	174.00
Disklass Social Social			
DeskPro 286N, 386N,	1Meg Module	118688-001	50.00
386SX/20, 386/25M, 486/3		118689-001	85.00
486S/25M, 486S/16M	4Meg Module	118690-001	149.00
Port 486C	8Meg Module	128377-001	309.00
M Series Exp 8d	0-64Meg		279.00
DeskPro 386/16	1Meg Kit	108071-001	99.00
	4Meg Kit	108072-001	269.00
	1-2Meg Exp Bd	108069-001	239.00
	4-8Meg Exp Bd	108070-001	399,00
DeskPro 286	512K Kit	113012-001	59.00
Prolinea 386	2Meg	141738-001	99.00
	8Meg	141742-001	299.00
Prolinea 486	1Meg	141682-001	55.00
Control of the contro	2Meg	141683-001	98.00
	4Meg	141684-001	159.00
	8Meg	141685-001	319.00

COMPAQ PORTABLES & LAPTOPS

LTE/286	1Meg Bd	117081-001	79.0
LTE/286	2Meg Bd	117081-002	99.0
LTE/286	4Meg Bd	117081-003	219.0
LTE/386S/20	4Meg Module	121125-002	179.0
LTE LITE/20, 25, 250	4Meg Module	129769-002	179.0
LTE LITE/20, 25, 250	BMeg Module	129769-003	349.0
LTE LITE/20, 25, 25C	16Meg Module	129769-004	699.0
LTE LITE 4/25C	4Meg Module	142337-002	219.0
LTE LITE 4/250	8Meg Module	142337-003	389.0
LTE LITE 4/25C	16Mag Module	142337-004	
			C
SLT/286	1Meg Module	110235-001	79.0
SLT/236	4Meg Module	110237-001	209.0
SLT/386	1Meg Module	118303-001	79.0
SL1/386	2Meg Module	118304-001	109.0
SLT/386	2Meg Module	118305-001	169.0
Contura 320, 325	2Meg	139497-001	99.0
manual designation	4Meg	139498-001	169.0
	Ellen	120400 001	200 6

PCMCIA VERSION 2.0 (for Palmtop & Subnotebooks)

MODEL S-RAW Cards 1MEG S-RAW Cards 2MEG	PRICE 179.00 319.00	Flash Memory OTP	PRICE Call
Palm Modem" 2400 Er HP LX 4	95 Call	Ethernet	Call
Optical Media Card HP 95LX Palmtop c	call omputers.	Dell 320 SLI, Sharp, NCR, Fojitsu	

WE WILL TRY TO MATCH OR BEAT ANY ADVERTISED PRICE

All products Brand new & guaranteed • We buy excess inventory Trademarks are registered with their respective companies.



22825 Lockness Avenue • Torrance, CA 90501

TOSHIBA LAPTOP MEMORY

MODEL	AMT, UPGRADED	MANU, PART #	PRICE
T1000SE/XE/LE	2Meg	PC14-PA8312U	75.00
T2000/T2000SX	2Meg	PC18-PA8317U	75.00
T2000SX/T1000LE	4Meg	PC-PAS314U	149.00
T2000SX/T1000LF	8Meg	PC14-PA8315U	269.00
T2000SXE/2200SX/T1800,	1850, C 2Meg	PC-PA2000U	75.00
T2000SXE/2200SX/T1800,	1850, C 4Meg	PC-PA2001U	149.00
T2000SXE/2200SX/T1800,	1850, C 8Meg	PC-PA2002U	269.00
T4400SX, SXC T6400	2Meg	PC-PA2003U	129.00
T4400SX, SXC T6400	4Meg		
		PC-PA2004U	169.00
T4400SX, SXC T6400	8Meg	PC-PA2005U	299.00
T4400SX, SXC T6400	16Meg	PC-PA2010U	599.00
T4400SX, SXC, T6400	32Meg	IVA	2999.00
T4500, T4500C	4Meg	PC-PA2012U	199.00
T4500, T4500C	8Meg	PC-PA2013U	349.00
T4500, T4500C	16Meg/32Meg	N/A / N/A	799.00/2799
T3300SL	2Meg	PC-PA2006U	99.00
T3300SL	4Meg	PC-PA2007U	169.00
T3300SL	6Meg	PC-PA2008U	229.00
13300SL	8Meg	N/A	369.00
T3300SL	16Meg	PC-PA2009U	749.00
T1200XE	2Meg	PC13-PA8306	85.00
11600	2Meg	PC8-PA8302U	85.00
T3100	2Meg	PC3-PA7135E	149.00
T3100=	2Meg	PC9-PA8340U	85.00
13100SX	2Meg	PC15-PA8308U	85.00
13100SX	4Meg	PC15-PA8310U	164.00
13200	3Meg	PC6-PA7137U	164.00
13200SX	2Meg	PC12-PA8307U	85.00
T3200SX	4Meg	PC12-PA8909	164.00
T3200SXC	2Meg	PC19-PA8318U	84.00
13200SXC	4Meg	PC19-PA8319U	
15100 15100	2Meg		164.00
	ZMeg	PC7-PA8301U	89.00
T5200/T8500	2Meg	PC10-PA8304U	94.00
T5200/T8500	8Meg	PC10-PA8313U	299.00

NOTEBOOK, LAPTOP MEMORY

ALR Venture AST Notebook Prem Exec 386SX/20/25/25L	1Meg/4Meg 4Meg	500314-003,	129 00/239 00 139 00
AST Power Exec 3/25C AST Power Exec 4/25SL	4Meg 2Meg 4Meg 5Meg 16Meg		189.00 129.00 209.00 Cali
Brocketti P310 Phys.	2Meg. 4Meg 1Meg 1Meg 4Meg	PEC 37650, 37651 23050-09100	119 00,199 00 109 00 109 00 249 00
Bondwell B310V, SX Bondwell B310V, SX Dell 212, 320N, 320N Oell 325N, 325NC Epson NB3 Epson NB3	2Meg 2Meg 4Meg 2Meg 4Meg	310-3210 A808511 A808771 A808781	119.00 119.00 179.00 129.00 219.00
Everex Tempo LX, LX20 Everex Tempo Carrier Goldstar GS520 3865X/16 Leading Edge DA T 3865X	8Meg 2Meg 2Meg 1Meg, 4Meg 1Meg	PCA 00053-0001	479.00 89.00 119.00 99.00,249.00 109.00
Leading Edge D/LT 386SX Magnavox Metalis NGR 3170	1Meg, 4Meg	3123-K104-9001	89.00,199.00
NGA 3170 NGB 3170 NGC 3170 NGC 9170 NGC Prospeed 286, 386SX-16 NGC Prospeed 386 NGC Prospeed 386 NGC Prospeed 386SX-20 NGC Prospeed 386SX-20 NGC Prospeed 386SX-20 NGC Prospeed 386SX-SX-XX	4Meg 2Meg 8Meg 1Meg 4Meg 1Meg 4Meg	3123-K116-V001 PC21-21 PC21-22 PC31-21 PC31-21 PC43-21 PC43-22 OP-410-6204 OP-410-6205	519 00 999 00 105 00 179 00 129 00 419 00 219 00 Call
NEC Ultralite III/20, 20P, 25C NEC Ultralite III/SU/25C NEC Ultralite SL/20, 20P NEC Ultralite III/25C Packard Bell 386SX, 286 Panasonic CF170, CF270, CF37/	2Meg 4Meg 6Meg 8Meg 1Meg, 4Men	PC47-21 PC47-22 PC49-21 PC47-23 286 3865X	Call Call Call Call 69.00,199.00 54.00
Saryo 17/18 NB Sharp 6781, 6881, 6785 Sharp PC-6220	2Meg	MBC-NBMEM2	109.00/209.00
Sharp PC-6220 Tandon, PC Brand, Dataworld TI Travelmate 2000 TI Travelmate 3000	2Meg, 8Meg 1 Meg 2Meg 2Meg	NB3865X-20 2568034-0001	85.00 89.00 85.00 79.00
Twinbead 486SX: DX	4Meg, 16Meg 4Meg/16Meg	2200330-1	199.00 999.00 229.00 999.00 69.00
Zeos 3865X Notebook Zenith Master Sport 3865X Zenith Master Sport 386, 286E Zenith Super Sport 286, 286E 2865, 2865 3X Alpha XX Beta Zenith Z-Mote 325L, LD	2Meg 2Meg 2Meg 1Meg 2Meg 2Meg 2Meg 2Meg 2Meg 2Meg	ZA-180-66 ZA-180-64 ZA-180-86	19,00 89,00 89,00 119,00 119,00 119,00 139,00/459,00

LASER PRINTER MEMORY UPGRADES

1	MEG	2MEG	4MEG		1MEG	2MEG	4MEG
HP 2,20,3,30,3P,2P,2P	- 2	104	164	OKG 400	200	99	
HP 4	Call	80	149	Canon LBP4	129	179	- 14
(8 MEG	- 305	3)		IBM Laser 4029	1.0	112	139
HP Paint Jet XL300				HP III SI	55		139
IDK Bd109 / 4MEG-	-258	/16 M	EG-745)	Panasonic 4455	-	119	-
Panasonic 4410/4430		119	189	NEC 90, 290	-	119	
Panasonic 4420/44501	89	119	189	NEC 95 QMS 410	***	159	240
Panasonic 4450	105	-	-	TI XL/PS17/PS35	40	129	249
Epson 6000, Action Lsr.	-	115	179	STAR LS04	129	179	269
Epson Action Laser II	Call	Call	Call	Starscript 4	129	179	269 269
IBM Laser 4019, 4019E	-	-	139	DeskJet 500, 500C	(256K)		64.00
Toshiba Page Laser 6	-	115	179	Compag Pagemar0		Call	Call
Dackard Ball DD0500		116	170	(8 MFG - Call	/ 16Me	n - Cal	I)

H.P. COMPATIBLE FONT CARTRIDGE

NO SURCHARGE FOR MASTERCARD, VISA OR DISCOVER PURIOHASE ORDERS ACCEPT-ED FROM FORTURE 2000, COVERNMENT, A INSTITUTIONS: Price a weakability subject to change. California orders and 52% scales fair. Relational orders or ordered winting parts are international orders shapped via UPS Av. API, FFO orders welcome. Outdomers are expected to pay cacinors and "other cargings of stopped that All stretch and drange, verified for transitional orders. AND REFUNDS AFFER 30 DAYS — DISCHARGES ONLY. We accept Mr. VISA, Docsover, All, prepair orders, profession orders, were brasiles. COD (cathers chick) orders, cach & caches orders, orders shapped by UPS, FEDX must be spread for ~21 MASSFACTURE PART FOR A FEDR REFERENCE ONLY. MISSRAD MOBELS 400.0

310-539-0019 FAX: 310-539-5844 WE'VE MOVEDIIIII TOLL FREE

1-800-433-3726

ESTAB. 1985 Mon-Fri, 8:00 a.m. to 5:00 p.m. PST Sat. 10:00 a.m. to 12:00 noon



IBM® PRINTERS BY LEXMARKIN

LASER PRINTERS	
LaserPrinter 4019 E 5749	þ
LaserPrinter 6 1969	þ
LaserPrinter 10 \$1129	į
NEW LaserPrinter 4039 10R \$1369	þ
NEW LaserPrinter 4039 12R 1729	þ
NEW LaserPrinter 4039 10D 11899	þ
NEW LaserPrinter 4039 12L \$2459	į
NEW LaserPrinter 4039 16L \$2799	į

PORTABLE	PRINTERS
140-1-	

Black or White 5349

EPSON LASER

EPSON

ACTION LASER	1000	 1644
ACTION LASER	1500	 1789
EPL-8000		 1849

EPSON DOT MATRIX PRINTERS

FX-810	-169	LQ-860 Cold	1554
AP 3250	\$189	LQ-1170	1589
FX-870	\$264	LQ-2550 Co	lor\$869
FX-1170	5349	DFX-5000	1269
LQ-870	5429	DFX-8000	12139
NEW LQ-5	70 +	***************************************	CALL
NEW LQ-1	070 +		CALL

Panasonic

LASER PRINTERS 1599 KX-P445 KX-P4410 1599 KX-P4451 1349 KX-P4430 1849 KX-P4455 1679 KX-P44501 1039

DOT MATRIX PRINTERS

KX-P2180	1159	KX-P1624	*324
KX-P1123	194	KX-P1695	5344
KX-P2123	1224	KX-P1654	\$514
KX-P2124i	1275	KX-P2624	\$354
KX-P2124	\$299		

CD-ROM SPECIALS

MultiMedia CD/ROM Upgrade Kit

for only...

Mitsumi

- Internal CD-ROM 350 MS ACCESS TIME
- Includes controller card. cable & device driver

Sound Galaxy Nx II

- · Supports AdLib and Sound Blaster, Covox and Disney
- Two Stereo Speakers
- 11 Voice FM Music
- Synthesizer
- Includes Software: Windat™. SoundScript, JukeBox, Sound Tracks, Galaxy Master and Windows 3.1 Drivers

~Software Bundles!~

5 Educational Titles or 5 Entertainment Titles Your Choice Only \$139

When puchased with CD-ROM Upgrade Kit



Information At Your Fingertips 24 Hours A Day

1-708-351-5419

Product Specification Monthly Specials **Tech Support Hints** Clearance Items

SILENTWRITER Model 95f

- 6ppm 2MB memory exp. to 5MB
 300 dpi, accepts model 9510 fax kit
- 35 scalable & 22 HP LaserJer fonts
 Genuine Adobe PostScript, Level 2,
 HP laserJet III w/HPGL (PCL Level 5)

Same as model 95f upgraded with 10 ppm and envelope feeder. Opt. fax upgrade available
SILENTWRITER Model 97fx

Same as model 97f upgraded with built-in plain paper send/receive fax capability1699

SILENTWRITER Model 990

- Only... 990 High performance RISC processor
- Up to 8ppm laser printer 35 scalable Adobe fonts & 14 HP
- LaserJer fonts 300 dpi • 2MB exp. to 4 MB

· First 90 days On-site Service by NEC

550 Mail-in Rebate on Canon BJ-200

BUBBLE JET PRINTERS

BJ-5	\$199	BJ-300	1329
BJ-10ex	\$244	BJ-330	\$499
BJ-200	1279*	BJ-800C	11549
		BJ-820C	11659

LASER BEAM PRINTERS LBP-4SX \$699 LBP-8SX \$1299

*After rebate. Offer Ends 5/30/93

MONITORS



2 year warranty 14" 3D \$459 349 1599

14" 2A 15" 3FGx 15" 3FGe 15" 4FGe 17" 5FG 21" 6FG NEC "OEM" Monitors 17" 5FG* . \$1129 21" 6FG* . \$1999 1609 \$719 \$1099

\$1249 \$2299





17" SyncMaster 5C \$899 FLEX VISION

14" 1024X768	. 1299
15" 1280X1024	. \$429

CTX

14" 5439-A	\$249
14" 5468	\$289
14" CPS 1461	1315
15" CPS 1560	1459
17" CPS 1760	

Proscan \$829 mag (5)



Panasonic



SONY



TOSHIBA LAPTOPS

A -
T1850 25MHz i386SX,
80MB/120MB \$1449/\$1629
T1850C 25MHz i386SX.
W/Windows & Trackball
80MB/120MB \$2099/\$2319
T3300SL 25MHz i386SL.
120MB ³ 2129
T4400C 25MHz i486SX.
120MB \$3389
T4400C 25MHz i486DX.
200MB\$4069
T4500 20MHz i486SX
80MB/120MB \$1849/\$1999
T4500C 20MHz i486SX.
120MB53729
T6400* 50MHz i486DX2.
200MB (AC Power Only) 34149
T6400C* Color, 50MHz i486DX2,
104000 COIDI, SUNINZ 1400DAZ,

*AC power only

DRIVES

200MB (AC Power Only) \$6359

Seagate HARD DRIVES

MicroSolutions 4 1

BACKPACK EXTERNAL DRIVES
Floppy Drive 3.5" or 5.25" 189
Floppy Drives require DOS 2.0 or above
Tape Drive
80/250 MB w/Data Comp 3389
Hard Drive 40 MB/100 MB \$409/\$499

Tape & Hard Drives require DOS 3.0 + TAPE BACK-UP



Ask about special on tape caddy.

JUMBO 120 120MB storage capacity INT. SYSTEM \$149 EXT. SYSTEM \$239

JUMBO 250 250MB storage capacity INT. SYSTEM 1209 EXT. SYSTEM 1295

DATA CARTRIDGES

DATA CARTRIDGES			
DC2000 40/80MB	\$16.99 ea.		
DC2000 Form			
DC2080 80/160MB	\$21.95 ea.		
DC2080 Form			
DC2120 120/250MB	\$23.95 ea.		
DC2120 Form.			
DC6150 250/500MB	\$21.49 ea.		
DC2060 60MB Form			
DC6250 250/500MB	\$25.49 ea.		
DC6525 350/700MB			

MODEMS

Haves

OPTIMATM 24 + FAX96 11	39
OPTIMA™ 96 + FAX96 13	79
OPTIMA™ 144+ FAX144 13	889
SMARTCOM EXEC	69
POCKET EDITION™ 2400 1	19
II SRobotics	

THE PERSON NAMED IN COLUMN 2 I	
	1169
Sportster 9600 FAX (ext)	\$179
Sportster 14.4 FAX (int)	1189
Sportster 14.4 FAX (ext)	
World Port 14.4 V.42 bis (ext)	\$399
Courier V.32bis FAX (int)	\$399
Courier V.32bis FAX (ext)	\$439

COMPAQ SYSTEMS

COMPAG



VIDEO CARDS

COMPAQ DESKPRO 486/33M
120MB 129298 12,199
120MB/w 129296 12,399
COMPAQ DESKPRO 50M 12,549/13,239
COMPAQ DESKPRO 50M (W)
120MB/340MB 12,769/13,369
COMPAQ DESKPRO 66M (W)
13,649

0.4		
6	ISA Graphic Cards	
144	Stealth 24 - 1MB 15	
DIAMOND	Stealth Pro - 2MB 535	



16-bit SVGA Accelerator Card for Windows - 1MB 109

GRAPHICS ULTRA+

ProDesigner II/s - 1MB ... \$149
Fahrenheit 1280 - 1MB ... \$179
ORCHID Fahrenheit VA - 1MB \$209

H-P FAX MACHINES

HEWLETT PACKARD

HP FAX-200 Plain paper fax 1959 HP FAX-310 Plain paper fax 1279

USA| FLEX ORDER 800-876-5606

FAX (708) 351-7204 Government/Ed. Sales 1-800-374-9904 Government/Ed. FAX (708) 351-9871

Habla Espanol 1-800-723-5500 / 1-708-924-6780 24 HOURS

Pour les Francophones 1-800-723-2256 / 1-708-582-6179







COMPUTER DISCOUNT WAREHOUSE



AN IMPORTANT

ABOUT COMPUTER DISCOUNT WAREHOUSE

E-MAIL MESSAGE

FACT: CDW® has doubled the quantity of products it now carrries to 15,000.

BENEFIT: Now there are twice as many reasons for you to buy your Computer Hardware, Peripherals and Software from CDW®.



WHY PAY RETAIL? CDW® SELLS SOFTWARE **FOR LESS!**



MICROSOFT **ACCESS** for Windows ONLY

85.42

25719

5TH GENERATION DIRECT ACCESS	62.07
5TH GENERA TION FASTBACK PLUS V3.1	
5TH GENERATION FASTBACK WIN	91.81
ADOBE PHOTOSHOP FOR WIND V2.5	
ADOBE WIN TYPE MGR V2.01	61.90
ALDUS PAGEMAKER V4.0	
AUTOMAP ROAD ATLAS	55.42
APPROACH WIN COMP UPG	90.84
LANTASTIC WIN	146.97
ARTISOFT ARTICOM MODEM SHARING	204.96
ASYMETRIC DAYBOOK PLUS V1.5	38.33
AUTODESK AUTOSKETCH WIN	162.10
AUTOSKETCH V3.0	85.53
BANNER BLUE ORG ADV V6.0	60.13
BERKELEY AFTER DARK WIN	27.64
BITSTREAM FACELIFT WORDPERFECT	59.39
BLOC PUBL FORMTOOL GOLD	56.90
BORLAND PASCAL OBJECTS V7.0 3.	317.70
BORLAND TURBO PASCAL V7.0	96.25
QUATTRO PRO 4.0 WIN COMP UPG	87.25
BORLAND BRIEF V3.1	
BORLAND C++ 3.1 WIN/DOS	313.30
BORLAND C++ APP FRAMEWORK V3.1	467.74
BORLAND DBASE IV VI.5	
BORLAND DBASE COMPILER V1	316 13
BORLAND DBASE IV 2.0 LIC/NODE	272.77
BORLAND DBASE IV 2.0 UPG	
BORLAND PARADOX 4.0	501.42
BORLAND PARADOX 4.0 UPG	171.52
BORLAND PARADOX 4.0 NODE	
BORLAND QUATTRO PRO 4.0 WIN/DO	
BORLAND TURBO C + + DUAL V3.0	66.24
BORLAND TURBO C++ WIN V3.1	
BORDERBUND WIN PRINTSHOP DELUXE	47.00
BRODERBUND PRINT SHOP DELUXE	
CAERE OMNIPAGE PROFESSIONAL V2	
CENTRAL POINT VI.4 ANTIVIR	97.04
CENTRAL POINT PC TOOLS V8.0 3	105.45
CENTRAL POINT PC TOOLS VALUE	
CALERA WORDSCAN PLUS	
CNS ACT WIN	224.67
CNS ACT SOFTWARE 2.1	
CA CLIPPER V5.2	452.80
COREL DRAW COMPETITIVE UPG COREL SYSTEMS DRAW V3 0	158.31
COREL ARTSHOW 3 1992 CD	25.00
COREL SCSI SOFTWARE DRIVERS ON	
DAC EASY ACCOUNTING V4.3	90.34
DCA CROSSTALK 16 VERSION 3.8	108.62



WordPerfect for Windows 5.2 Upgrade ONLY 571.13 26514

DCA CROSSTALK WIN V2.0	69.64
DELRINA DOSFAX PRO	
XTREE WIN	
XTREE GOLD V2 55 5 25/3 5	86.80
GAZELLE QDOS III 5 25/3 5	
GENERIC CADD V6.0	248 55
GENERIC CADD V6.0 HEWLETT PACKARD DASHBOARD WIN	44 30
HAYES SMARTCOM WIN IBM OS 2 V2.0 3.5 OPERATING SO INTEL LANDESK MANAGER V1.0 WIN	90.95
IBM OS 2 V2 A 2 6 OPERATING SO	128.05
INTEL LANDESK MANAGER VLOWIN	591 38
INTUIT QUICK PAY DOS/WIN 2.0 D	38.34
INTUIT QUICKEN WIN V2.0	
INTUIT QUICKBOOK	
INTUIT BUNDLE QUICKBOOK & QUIC	100.49
INTUIT QUICKEN 6.0	
IRMA III EMULATION SFTW	222 34
KODAK PHOTO CD ACCESS	29.40
LASERTOOLS TRUETYPE WORDPERFECT	29.40
LOTUS OS/2 123 V2.0 SINGLE W/D	
LOTUS OS 2 FREELANCE GRIPHICS UC NO DOCS	268 22
LOTUS CC:MAIL 10 USER PACK	216.12
LOTUS CCMAIL TO USER PACK	E25 10
LOTUS AMI-PRO NODE WIN	
LOTIES V2 A LIDG	02.04
LOTUS V3.4 UPG LOTUS 123 V2.4 UPG LIC PAC	92.54
LOTUS 123 V2.4	218 80
LOTUS 123 2.4 SERVER	389.03
LOTUS 123 V2 4 NODE	
LOTUS 123 2.4 UPG RADE KIT	02.04
LOTUS 123 WIN	
LOTUS 123 WIN NODE	205.07
LOTUS 123 WIN UPGRADE	293.02
LOTUS AMIPRO 3.0 COMP UPG	
LOTUS AMI PROFESSIONAL 3.0	
LOTUS AMI PRO VER UPG 3.0	
LOTUS FREELANCE V2.0 OS/2	226.26
LOTUS MAGELLAN	£3.30
LOTUS ORGANIZER V1.0	
LOTUS SMART SUITE BUNDLE 123W	434.42
LOTUS WORKS V3.0 DUAL MEDIA	
MECA MANAGING YOUR MONEY V9.0	
MERIDIAN CARBON COPY PLUS V6.1	
MERIDIAN CARBON COPY WIN	
MICROGRAFX ABC FLOWCHARTER V2	20.43
MICROSOFT COBOL V5.0 UPG	
MICROSOFT COBOL VS.0	534.92
MICROSOFT V6.1 MACRO ASSEMBLER	122 62
MICROSOFT OFFICE UPG	
MICROSOFT VISUAL BAS WIN	76.14
	116.71



LOTUS IMPROV for Windows ONLY

\$89.99 27585





MICROSOFT DOS V 6.0 Upgrade ONLY

547.75 27696

POWERUP CALENDAR CREATOR PLUS	45.11
POWERUP CALENDAR CREATOR • WIN	45.29
DATASTORM PROCOMM PLUS V2.01	69.67
DATASTORM PROCOMM PLUS WIN	86.02
DUAL ITAS 386 MAX VII D	59.39
QUARTERDECK DESQVIEW.X QUARTERDECK DESQVW 386 V2.4	153.45
QUARTERDECK DESOVW 386 V2.4	118.87
QUARTERDECK QEMM V6.0	59.34
QUARTERDECK QEMM GAME PACK	73.09
RIX SOFTWARE WINRIX	180.28
S-P HARVARD GRAPH DOC PK 1DOC	31.25
SPC HARVARD CRAPHICS 30	345 81
SPC HARVARD GRAPHICS 3.0 NODE	355.58
CDC HADVADD CDAPHICS WIN VI 03	227.60
SPC HARVARD GRAPHICS WIN V1.03 UPG	307.03
SPC PFS PRO WRITE V2.2	
SABER LAN WORKSTATION	
SABER LAN WORKSTATION NODE LIC	
SHAPEWARE VISIO VI.0 WIN	
SPINNAKER PFS WIN WORKS	42.17
STORAGE DIMENSIONS SPEEDSTOR	
STACKER V3 0 WIN/DOS	88.39
SYM PC ANYWHERE HOST & REMOTE	
SYMANTEC PC ANYWHERE HOST & RE	
SYMANTEC 2.1 ANTI VIRUS	
SYM NORTON B/UP V2.0 WIN 3.5	90.77
SYMANTEC NORTON DESKTOP WIN 2.0	
SYMANTEC NORTON DESKTOP V2.2 W	103.74
SYMANTEC DESKTOP WIN	104.78
SYMANTEC NORTON COMMANDER V3.0	90.24
SYMANTEC NORTON UTILITIES V7.0	104.78
SYMANTEC PC ANYWHERE 45 REMOTE	52.82
SYMANTEC PC ANYWHERE 4.5	101.04
SYMANTEC PC ANYWHERE WIN	
SYMANTEC PC ANYWHERE NODE	
SYMANTEC Q&A 4.0	
TOUCHSTONE CHECK IT PRO DUAL	57.83
WORDPERFECT & 1 UPG	
WORDPERFECT DOS NODE W/DOC	100 57
WORDPERFECT WIN 5.2 NODE W/DOCS	
WORDPERFECT PRESENTATION V2.0	
WP OFFICE 3.1 ADD LIC NO MEDIA	
WP DOS/WIND/OS2 NODE W/O MANUA	153.45
WORDPERFECT LETTER PERF ECT	153.45
WORDPERFECT OFFICE V3.1 DUAL M	
WORDPERFECT PRESENTATION UPG TO V2.0	70.44
WORDPERFECT COMP UPG V5.2	
WORDPERFECT DATAPERFECT 2.2 UPG	95.10
WORDPERFECT UPG KIT 5.1 TO 5.2	
WORDPERFECT VER 5 1	755.91

WHY WAIT? CALL COMPUTER DISCOUNT WAREHOUSE NOW!

CDW EXTENDED HOURS fes-7:30-7:30 CDT Mon-Frt. /9:00-8:00 CDT Sat FREE TECH SUPPORT for Customers

WE SELL NAME BRAND ITEMS FOR LESS!

(708) FAX 291-1737 ©1993 CDW* Computer Centers, Inc

COMPUTER DISCOUNT SERVICING YOUR PC NEEDS SINCE 1982-DON'T ACCEPT ANY IMITATIONS.

PIXAR TYPESTRY WIN . POLARIS PACKRAT V4.5

D & B Rated 3A1 Duns 10-762-7952



PCW682

No Surcharge For Credit Cards





COMPUTER DISCOUNT WAREHOUSE



Canon BJ-200 BubbleJet

Personal Printer

PC Magazine says, "...many users will be hard-pressed to see any difference between this and laser printed pages without resorting to a magnifying glass." December 22, 1992

✓ Multi-Purpose Feeder Holds 100 Sheets Letter/Legal Paper and Feeds

Them Automatically / 49KB RAM / 8KB Cache / Parallel Interface / Operates at 42 dbA or Less / Canon Native. Epson* LQ and IBM X24E Emulations / Weighs 6.6 lbs 2 Year Limited Warranty

NETWORKING PRODUCTS

CDW® Price

Canon



CDW® SERVICING YOUR COMPUTER **NEEDS SINCE 1982**

Intel Ether Express" 16, 16TP &16C LAN Adaptors

✓ SoftSet⁻ Autoconfiguration ✓ Installs and Configures in Less than 5 Minutes / On-board, On-Network, and Responder Diagonstics / Supports Twisted-Pair and Thick-Wire Ethernet Cabling / Two Data Transfer Modes-Shared Memory or I/O Data Transfer



\$119.33 CDW 20754 CDW® Price....

PRICES HARDWARE, SOFTWARE & PERIPHERALS AT

THOMAS-CONIGID 5043T 10BT Ethernet, 5046T 10BT PS/2 Ethernet, 5055 8 Port 10BT Concentrator 4 Port Passive Hub 4035 4MBPS Toke Ring Adapter 6242TP+ 8BILTP Arcnet, 6242 16-Bit Arcnet, Coax, TP, TP+ 6242 Arcnet 8-Bit. 176.47 6151-11 16 Port Smart Hub...... 6151 16 Port Arcriet Smart Hub 4045 16/4 Token Ring XT/AT 405.23 349.50 969.18 100 MBPS TCNS Smart Hub 6 Coax. NNOVELL NOVELL Netware V4.0. 469.50 999.73 1999.78 NOVELL Netware V3.11, 5 User 3.5 552.17 NOVELL Netware V3.11, 5 User 3.5". NOVELN teknare V3.11, 20 User 3.5". NOVELL Netware V3.11, 20 User 3.5". NOVELL Netware V3.11, 50 User 3.5". NOVELL Lite Winter DOS. NOVELL Lite Winter DOS. 1252.17 1752.17 399.77

199.65

1713.33 3498.20 4951,66

ETHERNET Interface Connector (NE1000)	129.44
ETHERNET Board (NE2000)	136.06
ETHERNET Esa (NE3200)	687.50
ARTISOFT	
AE1/T 10 Base T Adapter, 8-Bit ARS-190	109.52
AE2/T Ethernet ISA Adapter, 16-Bit ARS-170.	179.58
AE3 Ethernet Adapter	219.26
Articom Modern Sharing	204.96
Central Station	399.66
NOS AL Software V5 ()	66 50
NOS AI 12 User	621.07
E143 Ethernet Adapter Kit	184.79
LANtastic Ethernet Starter Kit	443.31
LANtastic AE2 Ethernet Starter Kit for Windows	
LANtastic 10 Base T Starter Kit	589.20
LANtastic 2Mbps Adapter	129.54
LANtastic for Windows	149.17
CALL FOR ADDITIONAL ARTISOFT PROD	OUCTS

NOVELL Lite Add-On Kit.

NOVELL SFT III V3 11 5 User NOVELL SFT III V3 11 10 User NOVELL SFT III V3 11 20 User NOVELL SFT III V3 11 50 User

SMC	
SMC 3402TP Transceiver AUI/TP	129.62
SMC Arcnet Passive Hub	69.88
SMC Intelligent 8 Port Coax	399.99
SMC Ethernet 16 Bit Combo 6 Pack	788.88
SMC 3402F Transceiver AUI/Fiber	339.70
SMC Ethercard Plus Elite 16E 6 Pack	.689.09
SMC PS/2 Arcnet 310 Board	138.79
SMC 10BT EISA BusMaster 2 Channel	609.55
SMC 3512 TP 12 Node Concentrator	599.18
SMC 3402 TransceiverAUUBNC	137.60
Active Hub 8 Port Coax	229.88
Active Hub 8 Port Twisted Pair	345.68
3008 Coax 8-Bit Ethernet	89.82
3008 TP 10 BaseT 8-Bit Ethernet	99.53
3016 TP 10 BaseT 16-Bit Ethernet	125 50
PC 600FS Coax Arcnet File Server 16-Bit	
PC 650WS TP Archet Workstation 16-Bit	110.00
PC 650FS TP Archet File Server 16-Bit	119.00
TO BOUT O IT MICHEL PRE Server 16-Bit	199.25

I WAITE OF I	_,,,,,
NETWORKING PROD	HOTS
PC 600WS Coax Arcnet Workstation	16-Bit119.88
SMC PC130 8-Bit Arcnet Coax	68.50
SMC PC130E 8-Bit Arcnet Coax	99.00
SMC PC270 TP Arcnet Eisa 3200 Arcnet Twisted Pair	109.33
Eisa 3200 Archet Twisted Pair	736.08
SMC 8-Bit 10 Base T Ethernet Elite SMC Ethernet Plus/A PS/2 Coax Elite	200.10
SMC 16-Bit Ethernet Plus Coax Elite	129.10
SMC B.Rd Ethornal Plus Coay Elde	99.29
SMC 8-Bit Ethernet Plus Coax Elite SMC Combo Ethernet TP, Coax, AUI	Fide 155.57
3Com'	L=10(00.0)
3COM 3C503 TP 10 Base T 3COM 3C503-16 Etherlink II 16 bit 3COM 3C507 Ethernet Card	229.88
3COM 3C503-16 Etherlink II 16 bit	163.84
3COM 3C507 Ethernet Card	279.61
3COM 3C503 Etherlink	188.24
3COM Ethernet Repeater	829.03
Xircom	
PCMCIA Ethernet 10 BT Ext. Ethernet LAN Adapter-RJ45AUI/6	274.52
Ext. Ethernet I AN Adanter-R M5A116	INC 393 92
PE210 BX LAN Ethernet II/Thick	285.98
PT216B3 16/4 Taken Filing DB9	
Arcnet Pocket Adaptor Coax/RJ45	239 50/234 77
Ethernet Pocket Adaptor Thin Coax/10B	T200 55/720 55
Ethernet Pocket Print Server	242 50
Financial Control Plan Survey	70.00
Parallel Port Multi	530.22
TAPE, REMOVABLE & F	LOPPY
COLORADO MEMOR SISTEMS PR	
COLORADO 4GB SCSI Power Tape	
COLORADO Jumbo 120	155.37
COLORADO Jumbo 250	219.32*
COLORADO Trakker 120MB Portable I	Back-up 355.00
COLORADO Trakker 250MB Portable I	Back-up .419.21
Call For Accessories And In	terfaces
I-MEGA	
21 MB Floptical Insider Diskette Drive	339.00
21 MB Floritoni Ext Dissorte Denn	379 10
Tape 250, 250MB Tape Back-up Bernoulli PC Powered 90 Pro	199,10
Bemoult PC Powered 90 Pro	489.25/ 589.57
Bernoulli Transportable 90 Pro	639.81
Bernoulli Transportable 150 Pro	859.25
Bernoulli Insider 90 Pro	549.47

Bemoulli Insider 90 Pro	549.47
^	
SUMMIT.	
SUMMIT 120MB Int	199.99
SUMMIT 250MB Int	199.34
SUMMIT 250MB Int SUMMIT 305MB, Internal IDE 10MB/min	259.90
MICROSOLUTIONS	
External 100MB HD	499,06
External 200MB Portable HD	582.95
Backpack External Floppy 3.5"	189,41
Backpack CD ROM	229.12
Backpack External Floppy 5.25*	189.41
External 80-250MB Tape Backup	379,30
Mountain.	
MOUNTAIN TD250 Internal Tape Backup	
MOUNTAIN 120MB External Tape Drive	
MOUNTAIN 250MB Internal Backup	
MOUNTAIN 304MB Internal IDE Backup	
MOUNTAIN 250MB External Backup	
MOUNTAIN 2.0 Gigabyte External Filesafe	
MOUNTAIN 4.0 Gigabyte, Int. 4mm DAT	
Sidecar 305MB Portable Tape Backup	
Call For PS/2 Drives, Controllers, Acce Kits and Tapes	essory

IRWIN	
IRWIN A120PC-120 MB Internal IRWIN A250PC-250 MB Internal IRWIN A120E-120 MB Hgh Speed External IRWIN A120E-350 MB Hgh Speed External Call For Controllers, Accessory Kits and	209,89 289,13 319,68
*While Quantities Last	
No Surcharen For Cradit Care	de l

Means LOWER Net Cost To You!

NETWORKING PRODUC	TS
IBM TOKEN RING	
16M 16/4 PS/2 MCA	609 11
IBM 16/4 XT/AT	498.27
IBM 16/4 Multi Access Unit MAU	432.26
INTEL NETWORKING	
INTEL Token Express EISA 16/4	599.88
INTEL Ether Express 16-Bit Coax	119.53
INTEL Ether Express 16-Bit TP	119.33
INTEL Tower Express XT AT 16/A	
INTEL Ether Express EISA 32-Bit.	397.30
INTEL Etner Express 16bt TP 5 pk.	499.43
BORLAND (Base IV LAN Pas	626.37
BORLAND Quattro Pro Network Node	244.30
CC Mail Products	CALL
HARVARD GRAPHICS LAN Pack	
LOTUS 1-2-3, 2.4 Server	558.66
LOTUS 1-2-3, 2 4 Network Node	339.47
LOTUS 1-2-3, 3.4 Server	459.18
LOTUS 1-2-3 3 4 Network Node	
MICROSOFT Word 5.5 Network Node	
MICROSOFT Excel Network Nodes	
WORD PERFECT Office 5-User V.3.01	
WORD PERFECT Office 20PK V.3.01	923.08

TERMINALS
WYSE 50 Amber or Green349.15
WYSE 60 Amber or Green279.92
WYSE 160/30 Amber or Green
WYSE 185 VT320 Amber, Green or White 327.60
WYSE 150 Amber, Green or White 265.45
WYSE 325 Color 325ES Law Emission . 519.40 / 549.39
MULTIMEDIA, SOUND, CD's, FAX
Advanced Digital Systems PC PrimeTime389,14
Advanced Digital Systems VGA to TV Elite 267.21

MULTIMEDIA, SOUND, CD's,	PAA .
Advanced Digital Systems PC PrimeTime	389,14
Advanced Digital Systems VGA to TV Elite	267.21
Advanced Digital Systems Video Clipper	359.11
ARTISOFT, Wired for Sound	
ATI Stereo FX Sound Card	89.76
COMPLETE PC Communicator Data, Fax, V Mail., 13	39.56**
CD-ROM Software 5 CD's Bundle, Call For Titles.	129.18
COREL SYSTEMS Anshow	179.25
COREL SYSTEMS Arehow COREL SYSTEMS Draw CD 3.0	419.29
CREATIVE LABS Int. CD-ROM Upg Kit	388.33
CREATIVE LABS Sound Blaster	76.93
CREATIVE LABS Sound Blaster Deluxe	129.18
CREATIVE LABS Sound Blaster Pro MC	
CREATIVE LABS Sound Blaster Pro 16 Bit	229.23
CREATIVE LABS Sound Blaster Professional	179.28
CREATIVE LABS MultiMedia Starter Kit	449.82
CREATIVE LABS MultiMedia Int. Upgrade Kit	
CREATIVE LABS Video Blaster	
CREATIVE LABS Video Blaster Windows	338.29
HP Plain PaperFax 200/310 968/	
NTEL Smart Video Recorder	
KEYTRONICS 101 - Keyboard	
LOGITECH SoundMan	177.83
MICROSOFT Beethoven's 9th For Windows CI	49.50
MICROSOFT Bookshell For Windows	
MICROSOFT Multimedia Dev. Kit Windows	309.40
MICROSOFT Programmer's Library	249.75
MICROSOFT Windows Sound System	
MICROSOFT Works For Windows CD	
ORCHID Sound Producer	

* After Manufacturer's \$150 End-User Rehate

175.50

PRACTICAL PERIPHERALS FAX ME.

SIRIUS Publishing PC Karaoke SONY Desktop Libraries, Int. & Ext...

And mandacturer 3 3130 End-0301 Neodic		
CD-ROM & OPTICAL DR	VES	
HITACHI 3700	409.3	
HITACHI 1700SA Externit	467,4	
MAGNAVOX IN MPC CD ROM	329.0	
NEC CDR 38 External Portable	379.4	
NEC CDR 74-1 External	589.3	
NEC CDR 74 Multi-Media Bundle	819.3	
NEC CDR 84-1 Internal	529.9	
PANASIONIC LESO10 Worm Editorial	2199.9	
PANASONIC LE7010 Ext. 1 Gb Emissible Optics	2599.2	

CD-ROM & OPTICAL DRIVE	S	
SONY CDU-7205N External CD-ROM	453.10	
SONY CDU-535 Internal CD-ROM	279,10	
SONY CDU-54101 Internal SCSI CD-ROM	418.32	
SONY SMO-S501 650M6 Erasable Optical	2595,42	
TEXEL CD ROM Int 265 ms/ Complete Kit	439.27	
TEXEL CD ROM Ext 265 ms/ Complete Kit	515.08	
TEXEL Ext 265 ms/ Business Bundle Muti-Media.	995.77	
TEXEL Int 265 ms/ Business Bundle Multi-Media	893.21	
TEXEL Int 265 ms/ Consumer Bundle 2 . Multi-Me		
TOSHIBA 3301 External	509.64	

PLOTTERS, DIGITIZERS & SCANNERS

HURTA

KURTA 12 x 12 XLP/12 x 18 XLP 199.50/ 489.29 **KURTA 12 x 17** 538.27

CalComp

CALCOME	12 x 12 w/16 But	279.92
CALCOME	12 x 18 w/16 But.	559.77
	2024/2036 Pacesetter	
CALCOME	Classic 4036	CALL
CALCOME	Design Mate 3024	CALL

Summaglaphics immagraphics Summa III 12 x 12 253.60

agraphica Summa III 12 x 18. a Grid III 18 x 24..... IH INSTRUMENT

HOUSTON INSTRUMENTS DMP-81 HOUSTON INSTRUMENTS DMP-161 2619.49

PACKARD

3265.88 / 4168.25 1309.25 / 3009.70
6029.35
724.10/2529.36
1439.10
Scanner 837.99 Scanner 1088.40

VIDEO PRODUCTS	
VGA & SUPER VGA MONITORS	
MAGNAVOX Super VGA 1024 x 768 .39mm	259.2
MAGNAVOX Super VGA _28mm 7CM9089	309.0
MAGNAVOX 78M749 Mono 14* VGA	109.50
MAGNAVOX 17" CM9217, 31mm	749.5
MAGNAVOX 20 CM64, 20 Inch	
MAG Innovision MX15F 15* 1280 x 1024	819.2
MAG Innovision MX17F 17* 1280 x 1024	
NEC Multisync 3FGX/4FG	
NEC Multisync 5FG/5FG1247.93	/2298.5
NEC Multisync 2A	338.3
NANAO 17' 1280 x 1024 28 mm FST	
PANASONIC C1381I, 1024 x 768, 14",	325.7
PHILIPS 1438, 141, 1024 x 768	
PHILIPS 1557,15*, 1024 x 768, .28	499.5
RELISYS, 14', 28, 1024 x 768, '	279.4
SEIKO CM1760CR	
SONY 1430 14" 1024 25mm Digital SONY 1730/SONY 2030 CAL	. 599.9
VGA & SUPER VGA DISPLAY CARE	
(Y) (D - D - 0 ())	SOR A

ATI Local Bus Pro 2 MB	508.49
ATI EISA GRAPHICS ULTRA Pro 2 MB	
ATI GRAPHICS ULTRA +1 MB/ 2 MB 288.2	7/318.55
ATI GRAPHICS ULTRA Pro 1 MB/ 2 MB 426.9	
ATI MCA GRAPHICS ULTRA Pro 2 MB	
ATI GRAPHICS VANTAGE 1MB	174.24
ATLINTEGRA	79.38
ATT 8514 ULTRA 1MB	
ATI VGA Wonder XL24 1 MB	
DIAMOND Speedstar Pro Local Bus	
DIAMOND Speedstar Pro VGA	136.64
DIAMOND Speedstar Stealth VESA Local	
DIAMOND Speedstar 24X 1 MB	157.50
DIAMOND Viper w/2MB	414.21
HERCULES Graphite 1 MB	274.29
ORCHID Prodesigner IIS 1 MB	145.45
ORCHID Farenheit 1280 Plus, 1MB	
ORCHID Farenheit VA 1MB 1280 x 1024	205.32

CDW® means Service CDW® means Savings CDW® means Business CDW® means Experience CDW[®] means Technology ▶ CDW[®] means Networking ▶ CDW[®] means Computing

FREE TECHNICAL SUPPORT FOR CDW® CUSTOMERS. (708) 291-7575

WE SELL NAME BRANDS FOR LESS!

1993 CDW Computer Centers, Inc.

LOOK FOR SUPER SAVINGS ON SOFTWARE. REFER TO PREVIOUS PAGE



COMPUTER DISCOUNT WAREHOUSE



EPSON ACTION LASER 1500

Laser Printer

- ✓ PCL 5FX/LQ/GL Emulation
- 14 Bitmap, 134 Scalable Fonts

- Cartridge / HP Compatible Font Cartridge Slot ✓ Parallel

Warranty

TOSHIBA

✓ 6PPM ✓ 68000CPU/16.7 MHz ✓ 150 Sheet In/ 100 Sheet Out ✓ 300 x 300 DPI with RIT ✓ Optional 250 Sheet Tray ✓ One Element Imaging and Serial Interfaces / 2 MB. Expandable to 5 MB / 9"H x 14.5"W x 18"D, 22 lbs / 2 Year

CDW Price \$729.42 CDW 28767

EPSON

N° Sells For Less

AND SERVICES YOU BETTER

Texas Instruments TM4000 WinDX2/50



174.98 416.94

✓ 486DX2/50 MHz ✓ 8MB RAM 164 Gray Scales. Simultaneous LCD and CRT Display ✓1MB Video RAM / Nicad Battery / TI Utilities. Including Battery Pro, Large Cursor, Power Management Windows 3.1 Optimized in Bios and DOS 5.0 Included ✓ MicroSoft BallPoint Mouse ₹5.6 Pounds

200 MB Hard Drive. \$2998.14 CDW 25274

PRICES HARDWARE, SOFTWARE & PERIPHERAL

TOSHIBA	
4400C DX 25MHz, 4MB 200HD 3319.00 Coir 3 4400SX 25MHz, 2MB, 120HD, (CD 6400 46650 DX2 200HD, Gas Plasma 6400 46650 DX2 200HD, Color 11850 SX25, 4MB, 60HD, (CD 1252.56 Color 11850 SX25, 4MB, 120HD, (CD 1376.44 Coir 1450 46850 AMB, 120HD, (CD 1376.44 Coir 14500 46850 AMB, 120HD, (CD 1376.44 Coir 14500 46850 AMB, 120HD, (CD 1376.44 Coir	1999.00 2329.69 3898.12 5796.23 1826.88 1951.15 2489.98 3659.32
POWEREXEC EL 3/25 60HD/ 126HD 1263.39/ POWEREXEC EL 3/25 CADON NO MD POWEREXEC 3/25S, 44M8, 160HD, Color POWEREXEC 3/25S, 44M8, 160HD, Color POWEREXEC 3/25S, 44M8, 160HD/ 50 HD 1336.43/ POWEREXEC 3/25S, 44M8, 160HD/ 50 HD 1336.43/ POWEREXEC 4/25S, 44M8, 160HD/ 50 HD 1336.43/ POWEREXEC 4/25S, 44M8, 160HD/ 50 HD 1336.43/ POWEREXEC 4/25S, 44M8, 160HD/ Premmia 4/35D 8MB 3/40HD Premmia 4/35D 8MB 3/40HD Premmia 4/35D 8MB 3/40HD Premmia 10wer 15A SE 4/33 8MB 1 Premy Brava 3/33 4MB 120HD Brava 4/25S, 4/MB 120 HD Brava 4/25S, 4/MB 120 HD Brava 4/25S, 4/MB 120 HD Brava 4/35, 4/MB 120 HD	1768.42 1815.43 2947.92 1768.59 1515.00 3115.33 2099.29 2479.41 2898.53 3198.50 2526.39 969.28 1049.10
Canon	
INNOVA 486DX/33 Desktop 4 MB 210HD INNOVA 486DX/66 Desktop 4 MB 245HD INNOVA 3865X25 Notebook 4 MB 120HD FX Modern	1498.14 1929.32 1549.00
DTK Gràfika 386/33 DX, No HD, 4VB, VGA, 2 Ftgo 200-0 893, 95 / 46/33 DX, Town No HD, 8VB, VGA, 2 Ftgo 200-0 1330, 23 / 46/033 DX, No HD, 8MB, VGA, 2 Ftgo 200-0 1299, 68 / 48/65 DX2, Towes, 20(HD, 8MB, 2 Ftgo, DOS, Wn	1103.50 1728.41 1694.95 2346.59
PowerMate 425 120 HD, 4 MB, SVGA PowerMate 433 120 HD, 4 MB, SVGA PowerMate 466 240 HD, 4 MB NEC Ready 4565V/25, 4 MB, 170 MB 2 Piccpies NEC Ready 4560V/25, 4 MB, 170 MB 2 Piccpies NEC Ready 4560V/25 MB, 170 MB, 2 Piccpies NEC Ready 4560V/25 MB, 120 HD, Versa 466/25C Color 4 MB, 180 HD, Versa 466/25C Color 4 MB, 180 HD, Versa 466/25C Color 4 MB, 180 HD	1069,74 1349,64 1949,58 1179,62 1479,29 2099,90 2679,39 3977,22 3579,16
TEXAS INSTRUMENTS	
486 WIN 5X25, 120HD, 4 MB VGA, 486 WIN DX2-50 200HD 486 WIN DX25, 200HD, 4MB, VGA	1945.48 1029.76 1069.15 3637.12
HARD DRIVES	
Maxtor	
7120A 130MB IDE PO-12S1023MB 13MS, 3.5° FH, SCCI-2 P1-17S1503MB 13MS, 3.5° FR, SCCI-2 LXT535S 535MB 13MS, 3.5° FH SCSI-2 7345A 340MB 13MS, 3.5° HH SCSI-2 7213S 212MB 15MS, 3.5° HH SCSI-2	206.76 229.64 488.12 959.06 496.55 297.40 694.40 297.95
MCP1684-7 345MB HH. MCP1884-7 345MB ESDI MCP1586-15 676MB ESDI MCP1586-15 1345MB SCSI MCP1924-2076MB 14MS 5-25° FH, SCSI-2. MCP2105-560MB 10MS 3-5° HH, SCSI. MCP2112A 1000MB, 10MS 3-5° HH, IDE. MCP2112A 1000MB, 10MS 3-5° HH, SCSI-2. MCP154B 206MB, 14MS 5-25° FH, SCSI-2. MCP154B 468MB, 16MS 5-25° FH, SCSI-2.	899.44 1019.86 1227.30 1699.42 2485.88 1089.93 1569.59 1288.22 1966.94 1174.64
CONNER	
CP3000 40 MB, 38MS, 3.5° HH, IDE CP30104H, 123 MB, 19MS, 3.5° HH, IDE CP30264E, 84 MB, 19MS, 3.5° HH, IDE CP30264E, 123 MB, 19MS, 3.5° HH, IDE CP30546 450MB, 10MS, IDE CP30540 540MB, 10MS, 3.5° HH, IDE CP30540 540MB, 10MS, 3.5° HH, IDE CP30540 340MB, 10MS, 3.5° HH, IDE CP30540 540MB, 10MS, 3.5° HH, IDE CP30540 521MB, 14MS, 3.5° HI, IDE CP30264 251MB, 14MS, 3.5° HI, IDE CP30264 251MB, 14MS, 3.5° HI, IDE	

Ultrastor 34F Local Bus SCSI Controller Ultrastor 12F ESDIPROPRIO Controller 166.86 Ultrastor 12F ESDIPROPRIO Controller 166.86 CUAINTUM LUS Nardsard IIXI 150 MB LUS Hardsard IIXI 150 MB LUS Hardsard IIXI 150 MB ELUS Hardsard IIXI 150 MB ST 1	HARD DRIVES & CONTROLL	ERS
FUND	Ultrastor 34F Local Bus SCSI Controller Ultrastor 12F ESUF/Roppy Controller Ultrastor 24F EISA SCSI Controller	298.24 166.86 399.85
STATEMENT OF THE STATEMENT OF S	Quantum	
ST35/JAX 42MB 28 MS 1* IOE 198.4 ST3102A 106/MB 189.525* MFM 228.41 ST3144A 130/MB, IDE 16MS 229.51 ST2511 40 MB, 28 MS, 525* MFM 228.41 ST3144A 130/MB, IDE 16MS 35* JH-IDE 366.40 ST1239A 211/MB, IDE 439.94 ST148DA 426 MB IDE 439.94 ST148DA 426 MB IDE 89.95 ST32343 20 MB, IDE 439.94 ST148DA 426 MB IDE 89.95 ST476EF 76MB 50S; 1213.64 ST1420A 1050/MB, S25* JH-I, IDE 869.27 ST3283A 338/MB, I6MS, 525* JH-I, IDE 869.27 ST3283A 338/MB, I6MS, 525* JH-I, IDE 869.27 ST3283A 338/MB, I6MS, 525* JH-I, IDE 869.27 ST326A 100 MB 50S; 1213.64 ST1420A 1050/MB, I5MS, 525* JH-I, IDE 1059.80 ST1624A 668 MB SCSI 1213.64 ST1420A 1050/MB, I5MS, 525* JH-I, IDE 1059.80 ST1625A 100 MB, I5MS, 525* JH-I, IDE 1059.80 ST34A 100 MB, I5MS, 525* JH-I, IDE 1059.80 ST34B50A 1042/MB, I5MS, 525* JH-I, IDE 1059.80 ST34B6A 1042/MB, I5MS, 1042/MB, ISMS, IDE 1059.80 ST34B6A 1042/MB, I5MS, ISMS, IDE 1059.80 ST34B6A 1042/MB, I5MS, 1042/MB, ISMS, IDE 1059.80 ST34B6A 1042/MB, I5MS,	FLUS Hardcard EZ 127MB	203.70 259.20 539.45 319.14
\$\frac{1}{2}\$1 40MB. 28 MS, \$25 MFM \ 228.41 \ \$\frac{1}{2}\$34.40 (200MB). IDE. I6MS \ 219.51 \ \$\frac{1}{2}\$34.21 (200MB). IDE. I6MS \ 219.51 \ \$\frac{1}{2}\$34.21 (200MB). IDE. I6MS \ 219.51 \ \$\frac{1}{2}\$34.21 (200MB). IDE. I6MS \ 219.51 \ \$\frac{1}{2}\$34.22 (200MB). IDE. I6MS \ 219.51 \ \$\frac{1}{2}\$34.21 (200MB). IDE. I6MS \ 219.51 \ \$\frac{1}{2}\$34.21 (200MB). IDE. I6MS \ 219.52 \ \$\frac{1}{2}\$34.21 (200MB). IDE. I6MS \ 219.52 \ \$\frac{1}{2}\$34.20 (200MB). IDE. I6MS \ 219.52 \ \$\frac{1}{2}\$4.20 (200MB). IEMS \ 5.25 \ H+. IDE \ 869.20 \ \$\frac{1}{2}\$14.20 (200MB). IEMS \ 5.25 \ H+. IDE \ 869.20 \ \$\frac{1}{2}\$14.20 (200MB). IEMS \ 5.25 \ H+. IDE \ 3.20 \ \$\frac{1}{2}\$14.20 (200MB). IEMS \ 5.25 \ H+. IDE \ 3.20 \ \$\frac{1}{2}\$14.20 (200MB). IEMS \ 5.25 \ H+. IDE \ 3.20 \ \$\frac{1}{2}\$14.20 (200MB). IEMS \ 5.20 \ H+. IDE \ 3.20 \ \$\frac{1}{2}\$14.20 (200MB). IEMS \ 3.20 \ \$\frac{1}{2}\$20 (200MB). IEMS \ 7.20 \ \$\frac{1}\$20 (200MB). IEMS \ 7.20 \ \$\frac{1}{2}\$20 (200MB). IEMS \	STREAM ADME TO ME IT THE	120.02
ST11202A 668 MB SCSI	ST306A 84MB 18MS, 3.5° HH, IDE ST3120A 106MB ST2511 40 MB 28 MS, 5.25° MFM ST3144A 130MB, IDE, 16MS	194.84 189.94 228.41 219.51
DOT MATRIX & LASER PRINTERS 1745.00	\$11239A 211MB, IDE \$11239A 211MB, IDE \$11480A 426 MB IDE \$12383A 338MB, 16MS, 525* HH, IDE \$12383A 338MB, 16MS, 525* HH, IDE	439.94 819.37
CAINON CAINON CAINON CAINON CANON BJ00 Bubble Jet	ST41200N 1050MB	1309.29
CANON BJ10EX/BJ20 Bubble Jet 248,40 / 299,68 CANON BJ200 Bubble Jet 279,12* CA	DOT MATRIX & LASER PRINT	
No. 166 03	Canon	
No. 166 03	CANON BJ10EX/BJ20 Bubble Jet248.4 CANON BJ200 Bubble Jet CANON BJ300 /BJ330 CANON LBP4SX Laser 4PPM	0 / 299.68 279.12* 332.20 689.14
No. 166 03	*After Mfr.'s \$50 End-User Rebate, Ends	5/30/93
DFY 5000 123.00 DFX 5000 136.03 Action Laser 1000 GPPM PCL 2 MB 729.42 EPL 6000 Laser 1500 GPPM PCL 2 MB 729.42 EPL 6000 Laser 1500 GPPM PCL 3 MB 729.42 EPL 6000 Laser 1500 GPPM PCL 3 MB 729.42 EPL 6000 Laser 1500 GPPM PCL 3 MB 729.42 EPL 6000 Laser 10 Pages Per Minute 1077.13 NEC Standard 18 PS 19		
DFY 5000 123.00 DFX 5000 136.03 Action Laser 1000 GPPM PCL 2 MB 729.42 EPL 6000 Laser 1500 GPPM PCL 2 MB 729.42 EPL 6000 Laser 1500 GPPM PCL 3 MB 729.42 EPL 6000 Laser 1500 GPPM PCL 3 MB 729.42 EPL 6000 Laser 1500 GPPM PCL 3 MB 729.42 EPL 6000 Laser 10 Pages Per Minute 1077.13 NEC Standard 18 PS 19	FX870 259.74 LOB70	435.00
APCSG 15-30 APCSG 188-13 Action Laser 1900 GPPM PCL3 2MB 723-32 EPL 6000 Laser 1900 GPPM PCL3 2MB 723-32 EPL 6000 Laser 1900 GPPM PCL3 2MB 723-32 EPL 6000 Laser 19 PSG 1900 599-30 NEC Sinchwriter II 97 399-32 72000 24-pm 219-38 PSG 24-pm 322-58 PSG 24-pm 219-38 DOC-17 4000 289-51 ML 393 - Color 959-30 ML 184 Turbo 215-33 ML 590 419-30/559-52 ML 320 299-12 OL400 5590,00 ML 321 417-08 OL510 599-50 ML 322 417-08 OL510 599-50 ML 323 199-37 4430 Laser 199-11 123 199-37 4430 Laser 199-11 123 199-37 4430 Laser 199-12 1124 284-25 1624 339-93 1150 160-92 2824 399-48 1125 299-12 230-99 440 User Press 168-53 165-1 399-37 4430 Laser 199-12 1749-78 TI MicroWriter PST7 /PS35 869-19 / 1128-57 TI MicroWriter Basic SPPM 174-95 Dataproducts 960 RISC PS 9PPM 1419-95 Dataproducts 960 RISC PS 9PPM 199-51 H-P Deskjet SSO (Desker Portable 699-12 / 395-11 H-P Deskjet SSO (Desker Portable 699-12 / 395-11 H-P LaserJet II PM-P Laserjet II PRIS 398-579-10 H-P LaserJet II PM-P Laserjet II PRIS 398-579-10 H-P LaserJet II PM-P Laserjet II PRIS 398-579-10 H-P LaserJet II PM-P Laserjet II 199-90 PACIFIC DATA 1-MB to 7P III/II/IIII PRIS 399-10 (222-222-222-232-13) H-P LaserJet II PM-P LaserJet		1278.00
NEC		.188.13
NEC Sientwriter ili 97 P6200 24-pin 399.28 P6200 24-pin 1475.29 P6200 24-pin 399.28 P6200 24-pin 219.88 P6200 24-pin 219.88 P6200 24-pin 399.28 P62	Action Laser 1000 6PPM PCL4 Action Laser 1500 6PPM PCL5 2MB	729.42
Section 197		1077.13
Siechwiner II 97 P6200 24-pm 399.92 P3200 24-pm 219.88 P3300 24-pm 239.88 P320.589.59 P320.589.599.59 P320.589.599.59 P320.589.599.599.599.599.599.599.599.599.599	Sententer (95F1119 33** P6300	599.50
Color Colo	Silentwriter II 97	1475.29 219.88
M.320 299.12 OL400 569.00 M.380 209.00 OL830 999.96 M.380 209.00 OL830 999.96 M.380 209.00 OL830 999.96 M.393+ 919.20 OL840 1069.12 Panasonic 1123 199.47 4450 Laser 569.56 1123 239.09 4410 Laser 569.56 1123 239.09 4410 Laser 569.56 1213 239.09 4410 Laser 569.56 1213 239.09 4410 Laser 569.56 1213 239.09 4450 Laser 1099.12 1749.78 TI MicroWriter Basic SPPM 639.35 TI MicroWriter PST7 /PS35 869.19 1128.57 TI MicroWriter PST7 /PS35 869.19 TI Mic	OKIDATA	069.21
M.321 417.08 OLB 10 509.15 M.393 + 919.20 OLB 30 999.96 ML393 + 919.20 OLB 40 1069.12 Panasonic 1124	Mt.184 Turbo 215,33 Mt.590 .419.	20/569.52
Panasonic 1124 284.25 1624 339.93 1123 199.47 4450 1309 599.93 2180 169.92 2824 399.93 2180 169.92 2824 399.93 1634 230.99 4450 1309.94 1635 1309.94 4450 1309.94 1635 1309.95 4450 1309.95 17 MicroWriter Basic SPPM 639.35 17 MicroWriter PS17 /PS35 869.19 / 1128.57 17 MicroWriter PS17 /PS55 869.19 / 1128.57 17 MicroWriter PS17 / PS55 869.19 / 1128.57 18 MicroWriter PS17 / PS55 869.19 / 1128.57 18 MicroWriter PS17 / 119 /	ML321	909.15
1124 1 284 25 1624 339,93 1123 199,47 4430 Jacon 899,95 2180 160,92 2824 399,48 2180 2180 160,92 2824 399,48 2181 290,99 4410 Jacon 979, 818,95 1634 539,86 4450 Jacon 979,87 1654 539,86 4450 Jacon 979,87 1655 Jacon 979 1655 Jacon 979 1655 Jacon 979 179,76 179,		1069.12
2180 166.92 2824 386.48 2123 29.99 4410 Laser 1099.12 223.99 4410 Laser 1099.12 4455 Laser PS 539.86 4450 Laser 1099.12 4455 Laser PS 539.86 4450 Laser 1099.12 4455 Laser PS 539.86 4450 Laser 1099.12 774.97.8 TI MicroWritor PS17 /PS35. 869.19 / 1128.57 TI MicroWritor PS17 /PS55. 869.19 / 1128.57 TI MicroWritor PS17 /PS55. 1479.55 Laser 1099.19 / 128.57 TI MicroWritor PS17 /PS55. 1479.55 Laser 1099.19 / 128.57 TI MicroWritor PS17 / 1499.55 Laser 1099.19 /		
109-12 1749-75 1749-	1123 199.47 4430 Later	869.95
TEXAS INSTRUMENTS 1749.76 1749	2180 160,92 2624 2123 239,09 4410 Lister Physics	618.95
TI MicroWinter Basic SPPM. 1 MicroWinter PS17 (PS35		1749.76
TI MicroWriter PS17 /PS35. 869.19 1128.57 TI Microlaser TurboPlus PS 1479.55 TI Microlaser TurboPlus PS 1479.55 TI Microlaser TurboPlus PS 1479.55 CPI JETMEMORY 1MB for HPIIP/III/IIIID 75.56 Dataproducts 960 FISC PS 9PPM 1419.95 149.05 149.05 149.05 149.05 149.05 149.05 149.05 149.05 149.05 149.05 149.05 149.05 149.05 159.06 159.	TEXAS INSTRUMENTS	
CPI_JETNEMORY_IMB_ter_HPIIP_IIIIIID CPI_JETNEMORY_IMB_ter_HPIIP_IIIIIID CPI_JETNEMORY_IMB_ter_HPIIP_IIIIIID Dataproducts 960 RISC_PS_9PPM 1419.95 Dataproducts 966 RISC_PS_9PPM 1935.15 H-P_Desket_S06_Desket_PG_PRIMS_395.50/799.00 H-P_Desket_S06_Desket_PG_PRIMS_395.50/799.00 1935.15 H-P_Desket_S06_Desket_PG_PRIMS_395.50/799.00 1939.16	TI MicroWriter PS17 /PS35	639.35 / 1128.57 .1479.55
H-P LaserJet 4 «COAN Decome 701 Parasie 318.40 / 29.92 «ODAN TEO SI Parasie 180 SI Seral 299.28 / 229.22 «ODANTEO SI Parasie 180 SI Seral 299.28 / 229.22 PACIFIC DATA 3 Sin 1 Cart LAS3 245.00 PACIFIC DATA 1 MB for 2P Ill/IIID/IIIP 79.46 SEIKOSmart Label Printer i Pro CALL / CALL **Aher Man/acturies \$256 End User Restate Ends 4/21/93 IF YOU FIND A BETTER PRICE CALL US	CPI JETMEMORY 1MB for HPIIP/III/IIID	75.60
H-P LaserJet 4 «COAN Decome 701 Parasie 318.40 / 29.92 «ODAN TEO SI Parasie 180 SI Seral 299.28 / 229.22 «ODANTEO SI Parasie 180 SI Seral 299.28 / 229.22 PACIFIC DATA 3 Sin 1 Cart LAS3 245.00 PACIFIC DATA 1 MB for 2P Ill/IIID/IIIP 79.46 SEIKOSmart Label Printer i Pro CALL / CALL **Aher Man/acturies \$256 End User Restate Ends 4/21/93 IF YOU FIND A BETTER PRICE CALL US	CPI JETPAGE for HP IIP/IID/III Postscript Dataproducts 960 RISC PS 9PPM.	1419.95
H-P LaserJet 4 «COAN Decome 701 Parasie 318.40 / 29.92 «ODAN TEO SI Parasie 180 SI Seral 299.28 / 229.22 «ODANTEO SI Parasie 180 SI Seral 299.28 / 229.22 PACIFIC DATA 3 Sin 1 Cart LAS3 245.00 PACIFIC DATA 1 MB for 2P Ill/IIID/IIIP 79.46 SEIKOSmart Label Printer i Pro CALL / CALL **Aher Man/acturies \$256 End User Restate Ends 4/21/93 IF YOU FIND A BETTER PRICE CALL US	Dataproducts 965 RISC PS 9PPM	1935.15
H-P LaserJet 4 «COAN Decome 701 Parasie 318.40 / 29.92 «ODAN TEO SI Parasie 180 SI Seral 299.28 / 229.22 «ODANTEO SI Parasie 180 SI Seral 299.28 / 229.22 PACIFIC DATA 3 Sin 1 Cart LAS3 245.00 PACIFIC DATA 1 MB for 2P Ill/IIID/IIIP 79.46 SEIKOSmart Label Printer i Pro CALL / CALL **Aher Man/acturies \$256 End User Restate Ends 4/21/93 IF YOU FIND A BETTER PRICE CALL US	H-P Deskjet 550C/Deskjet Portable699.1 H-P Paintjet/Paintjet 300XL	2 / 395.11 / 2259.18
H-P LaserJet 4 «COAN Decome 701 Parasie 318.40 / 29.92 «ODAN TEO SI Parasie 180 SI Seral 299.28 / 229.22 «ODANTEO SI Parasie 180 SI Seral 299.28 / 229.22 PACIFIC DATA 3 Sin 1 Cart LAS3 245.00 PACIFIC DATA 1 MB for 2P Ill/IIID/IIIP 79.46 SEIKOSmart Label Printer i Pro CALL / CALL **Aher Man/acturies \$256 End User Restate Ends 4/21/93 IF YOU FIND A BETTER PRICE CALL US	H-P Deskjet 500 Color H-P LaserJet IIIPH-P Laser 4SI 879.10	517.39
COLAR December 100 SI Sensibility 100 SI SENSOR SI SI	The Company of the Co	
PACIFIC DATA IS IN 1 Cast. LADISHIP 79.46 SEIKOSmart Label Printer I Pro. CALL / CALL **Aher Manufacturier's \$250 End User Rebate Ends 421:93 IF YOU FIND A BETTER PRICE CALL US	KODAK Dicente 701/ Parallel 318.40	229.22
IF YOU FIND A BETTER PRICE CALL US	PACIFIC DATA 25 in 1 Can. LAS3 PACIFIC DATA 1 MB for 2P III/IIID/IIIP	245.00
IF YOU FIND A BETTER PRICE CALL US	SEIKOSmart Label Printer / Pro CAL **After Manufacturer's \$250 End-User-Robata Ends	L / CALL
The state of the s		

ERALS AT	
MODEMS & COMMUNICATIO	1
16 8 6 14 4 Counter Dual Std External 16 8 8 14 4 Counter Dual Std External	
14.4 Sportster External 14.4 Gourier V.32 bis External	
194.4 Sportster W. Pax External 16.8 HST Courier Ext Fax. 9600 Sportster w/Fax External LAN Modern V.32 BIS Ethernet 9600 V.32 Wardoport External	1
Worldport 14 4 V 42 BIS External Worldport 14 4 Fax Modern	1
Hayes	
ACCURA 144 - FAX144 ACCURA 98 - FAX96 ACCURA 2400B:2400 59.10	
OPTIMA 14.4 + Fax14.4	
OPTIMA 9500 V.32/+Fax96 339.50 OPTIMA 2400/ +Fax96 112.34 Pocket Edition	1
PRACTICAL	
14.4 V.3Z BIS. Snd/Rcv FAX Internal 14.4 Snd/Rcv Fax Mini Tower 14.4 Snd/Rcv Fax Pocket 9600 Snd/Rcv Fax Mini Tower Fax Me Rcv Fax cannage for HP Lasers	
intel	
SatisFAXtion 100 Int 2400 Data 9600/4800 Fax SatisFAXtion 200 Int 2400 42 Data 9600 Fax SatisFAXtion 300 Int 14.4 Data 9600 Fax SatisFAXtion 400 Int 14.4 Data 14.4 Fax SatisFAXtion 400E ext 14.4 Data 9600 Fax MULTI-TECH	
MULTI-TECH MT932BA 9600 MULTI-TECH 14.4 Ext.Fax/ Modern V.32 BIS MULTI-TECH MT696EA	3
MATH COPROCESSORS	3
INTEL 3870X 16/20/25/33 74.95 INTEL 387SX 16/20/25/387SX 33 74.95 INTEL 287XL/267XLT 78.00 INTEL 487SX/387SL Mobile 118.44 INTEL Rapid CAD For All 396 DX's CYRIX FashMath SX 16/20/25	1
CYRIX FasMath 287 8-20MHz. CYRIX FasMath DX33 MHz DX40 MHz 83.47	
BATTERY BACKUP AND	
AMERICAN	
Smart 1250 729.87 BACK UPS 900	

CYRIX FanMath 287 CYRIX FanMath DX33	8-20MHz MHz/DX40 MHz 8	75.40 3.47 / 89.06
BATTERY E		
A	MERICAN	
Smart 1250	.95 Smart 600 .25 Smart 900 	399.10 549.55
BC-250 99 BC-500 175 BC-600 LAN 246 BC-1250 LAN 475 OMNI 600 LAN 346 LapPower DC/AC 125	1.55 BC-500 LAN 1.13 BC-900 LAN 1.27 OMNI 450 LAI 1.69 OMNI 900 LAI	189.77 348.51 N. 269.17 N. 495.50

100	MICE	100/
APPOINT Thumb	elina Trackball	59.27
LOGITECH Foton	nan Pius.	539.30
LOGITECH Mous	eman Cordless	79.33
LOGITECH Scanl	Man 32/Scanman 256	. 129.55 / 225.25
LOGITECH Sens	Trackmanll/Portable	74.99 / 95.50
MICROSOFT Moi	use Bus or Serial No S	thw 95.50 / 79.80
MICHOSOFT Mo	use w.Windows 3.1	144.95
MICROSOFT Ball	Pont Mouse	109.50
MICROSOFT S	erial, No Software	79.80
ZNIX Super Mous	se II w/Windows 3.1	75.75

KINGSTON MEMORY	
EPSON EPI 7000 512K	61,3
EPSON ACTION LASER 2-8MB	134.0
AST BRAVO LC 32MB	1192.6
AST BRAVO 386SX/20, 386SX/25, 2MB. AST Premium, Power II, 1MB WPB. AST Premium, Power II, 4MB WPB. AST Premium 386C 4MB.	113.9
AST Premium, Power II, 1MB WPB	59.9
AST Premium, Power II, 4MB WPB	180.9
AST Premium 386C 4MB	227.8
COMPAO DESKPRO/ProSignia COMPAO DESKPRO/386/20E & 25E 4MB . COMPAO DESKPRO 386SX16 4MB .	187.1
COMPAQ DESKPROI386/20E & 25E 4MB	261.3
COMPAO DESKPRO 386SX16 4MB COMPAO DESKPRO 386SX20E 4MB COMPAO DESKPRO 386SX16 4MB	274.7
COMPAD DESKPRO 386SX20F 4MB	214.4
COMPAQ DESKPRO 386SX16 4MB	
COMPAQ DESKPROPPOSignia 8MB Module COMPAQ DESKPROPPOSignia 8MB Module COMPAQ DESKPROPPOSignia 8MB Module COMPAQ DESKPROPPOSignia 18MB Module COMPAQ DESKPROPPOSignia 3MB Module COMPAQ PAGEMARQ 20 2MB COMPAQ PAGEMARQ 15 & 20 MMB COMPAQ PAGEMARQ 15 & 20 MMB COMPAQ PAGEMARQ 15 & 20 MMB COMPAQ DESKPRO 388/16 8MB Exp. Bd COMPAQ OSKPRO 388/16 8MB Exp. Bd COMPAQ CONTURA NOTEBOOK 2MB COMPAQ CONTURA NOTEBOOK 2MB COMPAQ CONTURA NOTEBOOK 4MB COMPAQ LITE 4MB CREDIT CARD COMPAQ LITE 4MB CREDIT CARD COMPAQ DESKROP 388/16 SIZKB VIDEO COMPAQ DESKROP 388/33 4MB COMPAQ PROLINEA 486/33 4MB COMPAQ PROLINEA 3/2ZS 8MB HP LASERJET 18 IID 2MB HP LASERJET 18 IID 2MB HP LASERJET 18 IID 2MB HR LASERJET 18 IID 2MB	379.9
COMPAO DESKPRO/ProSignia 16MB Module	1249.9
COMPAQ DESKPRO/ProSignia 32MB Module	2448.9
COMPAN PAGEMARO 20 2MR	113.9
COMPAO PAGEMARO 15 & 20 4MB	168 6
COMPAO PAGEMARO 15 & 20 RMB	298 7
COMPAN PAGEMARO 15 & 20	578 3
COMPAN & Social BD W/22M	1973 3
COMPAN DESVERO SERVE BUR E- DA	500 2
COMPAC CONTURA NOTEROOV 2018	107.2
COMPAG CONTURA NOTEBOOK 2MB	201.3
COMPACIONIONA NOTEBOOK 4MB	201.3
COMPACIFIE AMB CREDIT CARD.	209.3
COMPACITIE BMB CHEDIT CARD	469.8
COMPACI DE 8MB 4/66/512KB VIDEO	87.1
COMPACIPHOLINEA 486/33 1MB.	69.5
COMPAC PROLINEA 486/33 2MB	119.6
COMPACIPROLINEA 486/33 4MB	187.6
COMPAQ PROLINEA 486/33 8MB.	379.3
COMPAO PROLINEA 3/2ZS 2MB	119.6
COMPACIPROLINEA 3/2ZS 8MB	381.9
HP LASERJET 2P/III 1MB. HP LASERJET II & IID 2MB HP LASERJET 2P/III 2MB MODULE HP DESKJET 500 & 500C 256KB.	78.4
HP LASERJET II & IID 2MB	118.7
HP LASERJET 2P/III 2MB MODULE	109.3
HP DESKJET 500 & 500C 256KB	93.8
HP LASERJET 3SI 4MB	168.2
HP LASERJET 3SI 4MB HP LASERJET 4 1MB	59.3
HP LASERJET 4 2MB HP LASERJET 4 4MB HP LASERJET 4 8MB	99.5
HP LASER IFT 4 4MB	99.5
HP LASER IFT 4 RMR	348.4
HE PAINT JET XI 300 4MB	261.3
HP PAINTJET XL300 4MB HP PAINTJET XL300 8MB	462 3
TEXAS INSTRUMENTS MICROLASER 1MI	59.3
TEXAS INSTRUMENTS TMANOO LAPTOP AM	B. 234.5
TEXAS INSTRUMENTS MICROLASER 1MI TEXAS INSTRUMENTS TM4000 LAPTOP 4M TEXAS INSTRUMENTS MICROLASER 4MB	234.5
IBM PS/2 MOD 70-E61 1MB	67.0
IBM IBM MOD 30 2MB	113.9
TOM TOM MOD 30 2MD	113.9
IBM PS/2 MOD 70-061 2MB	96.20
IBM PS/2 MOD 70 4MB	299.5
IBM PS/2 MOD 55SX 4MB	179.9
1BM PS/2 MOD 50 2MB,	241.2
IBM 4-16MB BD MOD 55S	299.5
IBM PS/1 2MB MEMORY UPGRADE	99.5
IBM PS/1 386SX 4MB UPRGRADE IBM 386 VALUE POINT 4MB	179.9
IBM 386 VALUE POINT 4MB IBM 486 VALUE POINT/PS1 4MB IBM 486 VALUE POINT/PS1 16MB	179.9
IBM 486 VALUE POINT/PS1 4MB	209.2
IBM 486 VALUE POINT/PS1 16MB	739.4
	430.0
NEC SILENTWRITER 2MB	108 3
NEC SW MOD 95 2MB	108.9
NEC SILENTWRITER 2MB NEC SW MOD 95 2MB NEC 2MB ULTRALITE III/SL20	1120
OKI LASER 400 2MB OKI LASER 800 2MB OKI LASER 800 2MB OKI LASER 800 2MB UPGRADE OKI LASER 840 2MB PANASONIC 4410, 4430, 2-4MB	127.3
OKI LASER 800 2MB	127.3
OKI LASER 810 2MB UPGRADE	194.3
OKI LASER 840 2MB	147.4
PANASONIC 4410, 4430, 2-4MB	125.7
TOSHIBA 2MB 2000SXE	119.0
TOSHIBA 2MB 2000SXE TOSHIBA 4MB 2000SXE	179.0
TOSHIRA 3300SI 2MR	119.0
TOSHIBA 3300SL 2MB TOSHIBA 3300SL 4MB TOSHIBA 3300SL 6MB	169.0
TOSHIBA 3300SL 4MB	284.9
TOSHIBA 4400SX 16MB	859.4
TOSHIBA 4400SX 16MB UPGRADE	212.2
TOSHIBA 4400SX 4MB UPGRADE TOSHIBA 4400SX 6400 8MB UPGRADE TOSHIBA 5200 2MB MODULE	213.0
TUSHIDA 44005X 6400 BMB UPGHADE	445.3

INTEL Overdrive 486/25DX / 486/33DX..479.66 / 639.55 INTEL Overdrive 486/SX/25Mrtz /20 Mtz 449.20 /329.44 INTEL Overdrive 486/SX/25Mrtz /20 Mtz 449.20 /329.44 INTEL Overdrive 486/S3SX / 19.49 INTEL OVERDRIVE / 19.49 INTEL OV

FAX (708) 291-1737

CDW Carries Over 15,000 Computer Products At Discount Prices. If You Don't See It, Call!

WHY WAIT? CALL COMPUTER DISCOUNT WAREHOUSE" NOW!

CDW EXTENDED HOURS

MOST ORDERS RECEIVED

Y 7:30 P.M. C.D.T. SHIP SAME DAY



1993 CDW Computer Centers, Inc.

WE SELL NAME BRAND ITEMS FOR LESS!

FAX (708) 291-1737

Credit card charges are not submitted until time of shipment

COMPUTER DISCOUNT
WAREHOUSE**
SERVICING YOUR PC NEEDS
SINCE 1812 - DON'T ACCEPT
ANY IMITATIONS.

D & B Rated 3A1 Duns 10-762-7952

No Surcharge For Credit Cards



LIFETIME * WARRANTY 00% GUARANTEED CALL FOR LATEST SIMM PRICES SIMM-SIPP MODULES FAST HARD CYFIX

80 EXECUTE: 9 1400 C

90 EXECUTE: 9 1400 C

90 EXECUTE: 9 1500 C

90 EXECUTE: 9 1500 C

90 EXECUTE: 1 1 135 256K X 9-100NS SIMM 145 256K X 9-80NS SIMM CALL 4MB X 9-BONS SIMM-PC DELIVERY. 54 00 56 00 4M8 X 9-70NS SIMM 4M8 X 9-60NS SIMM 1M8 X 9-100NS-9 CHIP 145 256 X 9-80NS SIMM 33 256 X 9-70NS SIMM 22 256 X 9-70NS SIMM 23 1MB X 8-80NS SIMM 24 1MB X 8-80NS SIMM 25 4MB X 8-80NS SIMM 26 1MB X 9-10NS SIMM 27 1MB X 9-10NS SIMP 28 1MB X 9-80NS SIPP 28 1MB X 9-80NS SIPP 12 TMB X 9-60NS SIPP CALL DRIVE CALL 12 256X X IF HOOMS SIFE GREAT 11 256K X 9 MONS SIPP IMB X 9-80NS 3 CHIP SIMM IMB X 9-80NS 9 CHIP SIMM IMB X 9-70NS 3 CHIP SIMM CALL CALL SUPER CALL 255X X 9-70NS SIFP SERVICE CALL 256K X 9-60NS SIPP 84.00 84.00 79.00 70.00 70.00 80.00 AND IMB X 9 70NS 9 CHIP SIMM IMB X 9 60NS 3 CHIP SIMM 256 x 36 + 1MB PRICES 3027-33 33M/C IIT CALL RESIDUE 20 ZAMPE NE SENTENCE SE ZAMPE SE Z CALL 512 X 36 - 2MB 3027-40 40MHZ 81 IOW IMB X 9-60NS 9 CHIP SIMM IMB X 9-53NS 3 CHIP SIMM 35875X-15 19M-0 IT SERVEN PRACT IT CALL 2 V 76 HARD SCALL **PRICES** WATCH IS NOW! CALL 4 X 36 + 18MB CONTROL ON THE PARTY OF THE PAR MINTED METTER (1994)

A TOTAL CONTROL TO THE CONTRO -NEC LAPTOP & 175 AT&T LASER 755 756 1363 NOTEBOOK SAFAR ASALTS
THAT AC STATE
THAT AC STATE
AND CA DEAD
EXPRISED
THAT AC STATE
THAT
THAT AC STATE
THAT
THAT AC STATE
THAT
THAT
THAT
THAT
THAT
THA PRINTER MEMORY Quantum 1 105 100 M m THE PERSONS FUÏITSU | The content of the TANTOLOGY 1 PT
TANTOLOGY 1 PT
TANTOLOGY 1 PT
TANTOLOGY 1 PT
TANTOLOGY 2 PT
TANTOL PALTON AN THE TYPE

PALTON AN THE TYPE

STORY AND THE TYPE

STORY AND THE TYPE

STORY AND THE TYPE

THE TY 70 10 Mapdor 285 125 ■ Seagate m 142 MICROPOLIS **EPSON** SILICON 107 See Act of Sec. 199.

Well Wood March 1 179.

Well Woo PERTATELED GRAPHICS CCNNER AST Comment CHI 198-17

Land Comment CHI 198-17

Land Comment CHI 198-17

Land Comment CHI 198-18

Land Chi 198-18 WESTERN **OKIDATA** DIGITAL MALE SCALE S 15 and 15 ANT-16751 1 15 ANT-16754 1 15 ANT-16754 1 15 ANT-16754 1 15 ANT-16755 1 **★**Apple TENTH Canon MASTORPHITTON

MATTERPORT DAY

MATTERPORT DAY (74.4 - 47.10) 4.711 (74.6 - 197.0) 5.2744 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | 1.95 (7.97.1 | OUTETT PETER PETER PETER STALL DELL Inches bears & one scale 200 1713 2000 1813
200 17132 200 171 TOSHIBA WITES SAFETY OF THE SAFETY OF COMPAG THE STATE OF THE S EVEREX 13 and Procession 1 (1) of the Procession 2 (1) of the TEMPO 12 CESS
200 WIS No. 1
200 WIS No. 1
200 WIS No. 1
200 WIS No. 1
200 WIS No. 2
20 40 380 580 730 730 115 n 1111 DESCRIPTION OF MAGNAVOX 700 360 1700 140 DOTTO DO MET NUST 298.

200.3

200.3

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0

200.0 125 125 162 20 THE RECORD SA SERVICE AND ADDRESS OF THE PROPERTY OF THE PROPE 175 625 (hp) ALR SUN **Panasonic** D 131, D 278, D 39 pt and tree D 200 pt and tree BROTHER SPACECHARDO DE
ANO MEZ FRAGO
SAN MEZ FRAGO
SPACECHARDO DE
SPACECHARDO DE ME.A. 27 APS 105 E.C. MINATO 106 E.C. MINATO 107 E.C. 110 ACER 50 Mark 10 h.A. 127

Mark 11 h.A. 127

Mark 12 h.A. 140

Mark 12 h.A. 165 SHARP AND STATE OF THE S QMS THE PLANT TO BE A STATE OF THE PLANT TO BE A STA PC AZES

MAST MODE CACCES

ZERNATE LASTES

MAST TO JUPINO

JURINE RAMIN STOR

JUNE CO NA

JUNE CO NA 1400 1 100 SAME AT ACTUAL SAME AT ACTUAL SAME AT ACTUAL SAME AT ACTUAL 170 100 173 **EXPANSION BOARDS** LOCAL BUS MOTHER BOARDS **DYNAMIC RAMS** CACHE RAMPAT: " use is to the other through the order (***) the compute feel making as written as eithers the report Support strends or UN 12 counted assessment county. Plat: " In a 1641 of memory with cut place and been the other through the counter that the counter that the place of the other through the support to UN 12 separate feel. \$145 1MB X 1-100NS 1MB X 1-80NS 1MB X 1-70NS 1MB X 1-60NS 256K X 1-150NS 256K X 1-170NS 256K X 1-100NS 386/486 3.95 4.20 4.25 4.70 1.50 1.55 1.70 \$199 249 210 260 349 490 540 743 385DX-33-64K CACHE W.CPU 385DX-33-756K CACHE W.CPU 385DX-40-54K CACHE W.CPU 64K X 4-100NS 2.10 ONE BOARD SOLUTION
386:486-54K Cache no CPU \$200
4860:35-64K Cache wCru
4860:35-64K Cache wCru
4860:35-64K Cache wCru
4860:35-64K Cache wCru
4860:35-64K Cache wCru 64K X 4-80NS 2.25 64K X 1-150NS 1.50 AST Rampage Plus /2MB \$169 64K X 1-120NS 1.75 1 & 4-BONS DIPP 21.00 FOR MEMORY PRODUCTS NOT LISTED, CALL FOR PRICES AND AVAILABILITY
PURCHASE ORDERS FROM GOVERNMENT AGENCIES - UNIVERSITIES - FORTUNE 2000 FIRMS - CALL 1-215-922-4650

NEVER A SURCHARGE ON CREDIT CARDS OPEN SATURDAY 10 - 6

ORDERS ONLY TOLL FREE
FAX
2-4640

1-800-457-6937

1-215-922-6 Water VISA TECHNICAL SUPPORT 215-922-4640 1-215-922-0116 ORDER TOLL-FREE FROM ANYWHERE IN THE USA OR CANADA. CALL FOR CURRENT PRICES AND VOLUME DISCOUNTS. PRICES AND AVAILABILITY SUBJECT TO CHANGE. ORDER LINES OPEN 6 DAYS MINIMOM ORDERS 50,000/USA SHIPPING & HANDLING-AIR \$12.00-AIR OVERHIGHT \$18.00-COD ADD \$4.00-PAR RESIDENTS ADD 75. SALES TAX PHERADIO ORDERS CALL FOR CONFIRMATIONALL RETURNS REQUIRE RMA# AND ORIGINAL INVOICE CANCELLED ORDERS AND RETURNS FOR CRICD TS USBECT TO 25% RESTOCKING CHANGE -RETURNED MERCHANDISE MUST BE IN NEW CONDITION AND RECEIVED WITHIN IN DAYS FROM INVOICE DATE, SORRY, NO REFUNDS AFTER IN DAYS, STUPPING AND HANDLING CHANGES NOT RETURNABLE HIRRIFICATIONAL ORDERS WELCOME PD. 5 ACCEPTED FROM GOVERNMENT ARE FROM FOR THE RESPICTIVE OF THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THIRD PRITY ALL TRADEMARKS ARE THE PROPERTY OF THE RESPECTIVE COWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THIRD PRITY ALL TRADEMARKS ARE THE PROPERTY OF THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THIRD PRITY ALL TRADEMARKS ARE THE PROPERTY OF THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THIRD PRITY ALL TRADEMARKS AND THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THIRD PRITY ALL TRADEMARKS ARE THE PROPERTY OF THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THIRD PRITY ALL TRADEMARKS AND THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THIRD PRITY ALL TRADEMARKS AND THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THIRD PRITY ALL TRADEMARKS AND THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THE PROPERTY OF THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THE PROPERTY OF THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THE PROPERTY OF THE RESPECTIVE OWNERS. ALL WORLDWIND TECHNOLOGY PRODUCTS ARE THE PROPERTY OF THE RESPECTIVE OWNERS. ALL WORLDWIND THE RESPECTIVE OWNERS. ALL WORLDWIND THE RESPECTIVE OWNERS. ALL WORLDWIND THE PROPERTY OF THE RESPECTIVE OWNERS. ALL WORLDWIND THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY O

WORLDWIDE TECHNOLOGIES

ATT ON MITTHER BOARDS **
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 Product Review"...You can be confident that what you order will work as soon as it arrives!"
- PC Computing Phantom Shopper "...Courteous service and terrific technical support!"

HEWLETT-PACKARD

Laserjet IV w/Toner \$1389
Laserjet IIP+ w/Toner \$809
Laserjet IIIP w/Toner \$889
Laserjet IV SI w/Toner \$3149
Laserjet 4M\$1979
1MG Upgrade \$69
2MG Upgrade \$99
4MG Upgrade \$149
Deskjet 500/500C, \$399/509
Deskjet 550C \$709
Pacific Page/XL \$269/\$699
Pacific Data 25 in 1 Font . \$239

Panasonic_a

		(
11241 .	\$269	2624 .	
2023	\$199	4410 .	. \$599
2123	\$229	4430 .	. \$859
2124	\$299	44501	\$1059
2180	\$179	4451 .	\$1379
1624	\$329	4455 .	\$1679
4410/4	4501 2	MG	\$129

Canon Innova Notebook 386SL-25

Mhz, 80 MG \$1359

Canon

BJ-	IUE	Α.							Ф	23	9	
BJ-2	20E	X							\$	35	9	
BJ-2	200								\$	27	5	
BJ-	300								\$	32	5	
BJ-S	300	C	a	r	t.					\$1	9	
BJ-3	330								\$	48	9	
BJC	-80	0						5	1	46	9	
BJC	-82	0		,				5	1	59	9	
LBP	-45	X							\$	66	9	
LBP	-85	X		*			,	\$	1	28	9	

BJ-200



*After \$50.00 Rebate - Until 5/30!

EPSON PRINTERS

LX810\$169	LQ570 \$235	LQ1170 \$569	DFX5000\$1259	Action 3250 \$189
FX870\$259	LQ870 \$425	LQ2550 \$849	DFX8000 \$2129	Action 1000 \$619
FX1170 \$345	LQ1070 \$339	EPL8000 \$829	Stylus 800 CALL	Action 1500 \$749
	NO SURC	HARGE FOR CHAR	GE CARDS!	

\$609

OKIDATA

ML320 \$299	ML393 \$909
ML321 \$419	3410\$1199
ML380 \$209	OL400 \$549
ML520 \$369	OL810 \$909
ML590 \$419	OL830 . \$1129
ML591 \$569	OL850. \$1259
OL400 2N	IB\$129

TEXAS INST. 🥸

TM 4000/WINSX 120	\$1949
	\$2479
TM4000/WINSX Color .	\$2649
LASER PS17	\$1029
LASER PS35	\$1159
LASER PS35 Turbo	\$1399

NETWORKING

Netware 2.2 5 User \$479
Netware 3.11 5 User \$569
Netware 3.11 10 User \$1289
Netware 3.11 50 User \$2599
Lantastic 10BPS Starter \$449
E143 Ethernet \$185
NE1000 Ethernet \$99
NE2000 \$135
Ethercard +/+16 \$119/\$139
3 Com EtherLink II \$185
Intel Ether 16 \$115
Intel Ether 16-5 Pak \$479
Intel Ether 16-20 Pak \$1759
Intel Ether EISA 32 \$509
Intel Token Express \$479
Irma Board 3\$399

SCAN. & DIGIT.

NEC

P3200/3300 \$225/\$325
P6200/6300 \$399/\$599
P9300 \$825
Model 95 Pscrpt Laser . \$1349
Model 95FX Laser \$1649

MONITORS



3 FGX

4 FG		٠.		4		٠		+			٠	٠		. 9109
5 FG		Ċ,											i	\$1245
5 FGE .														\$1059
6 FG								+					,	\$2249
	٨	11	7		:	u	F	31	15	:	н	ı		
EGA												•		. \$239
Diamon	d	S	C	a	ır	1	4	5	3	33	3(. \$429
Diamon	d	D	-	_	6	1	7							\$1050

HL6955 20"	_	2.0			-	-	٠.	
PAN	٧A	S	OI	V	C			
1381 VGA 1	02	4×	76	36	3 .			. \$319
1395 VGA 1	02	4×	76	36	1.			. \$429

		SAMSU	ING	
14"	Sync	Master	2	\$249
			15	
17"	Sync	Mactor	4	\$750

1991 VGA 1280×1024 .. \$1539

VIDEO BOARDS

TIPES BONIES
ATI VGA Wonder 1MG . \$139
ATI Graph Ultra + 2MG . \$299
ATI Graph Prof 1 MG \$409
ATI Graph Prof 2 MG \$479
Sound Blaster Prof \$169
1024 VGA 16 Bit 1 MG \$79

MODEMS

Hayes Accura 96/Fax \$219
Hayes Accura 14.4/Fax . \$245
Hayes 2400 Optima \$119
Hayes Optima 96 \$309
Hayes Optima 14.4 \$359
Hayes Optima 14.4/Fax . \$369
Hayes Ultra 96 \$539
Hayes Ultra 14.4 \$589
Practical Per. 2400 Int \$69
Practical Per. 2400 Ext \$99
Practical Per. 9600 Int \$169
Practical Per. 9600 Ext \$179
Practical Per. 14.4 Int \$185
Practical Per. 14.4 Ext \$199
US Robotics 9600 \$489
US Robotics Dual Std \$709
US Sport 14.4 Ext. Fax . \$199
US Sport 14.4 Int. Fax \$179
1.4

intel.

SatisFAXtion MODEMS	
100 2400/9600 Fax	\$99
200 2400 V.42/9600 Fax.	\$269
300 14.4/9600 Fax	\$275
400 14.4/14.4 Fax	\$369
	\$379
Faxability Plus/OCR	\$159

CHIPS

256K/1 MG Chips each \$3/\$5
256K/1MB Simms \$15/\$39
4MB Simms \$139
Epson Action 2 MG \$109
HP 2MG Upgrade \$99
HP 8MG Upgrade \$269
Intel ISA 2 MB \$299
OKI Laser 2MB \$129
intal

80287-10XL/XLT \$7	9
80387 SX-16/20/25 \$7	5
80387 SL \$7	5
80387-16/20/25/33\$8	5
Overdrive SX20/25 \$309/\$42	5
Overdrive SX33 \$54	9
Overdrive DX25/33 \$425/\$54	a

SOFTWARE

Aldus Pagemaker \$489
Corel Draw \$369
Lotus 123 2.4/3.1 \$325/\$389
Microsoft Excel Wndws . \$299
Microsoft Windows 3.1 \$69
Microsoft DOS 5.0 \$79
Microsoft DOS 6.0 \$69
PC Tools 8.0 \$119
Quicken \$49
Word Perfect 5.2 \$259
Word Perfect Windows . \$259

DRIVES & TAPES

Ext. 1.2 for PSII \$159
Toshiba 31/2" 1.44 \$69
Colorado Jumbo 120 \$145
Colorado Jumbo 250 \$199
Colorado Trakker 120 \$339
Colorado Trakker 250 \$395
lomega 250 \$199
Irwin 120/250 \$169/\$199
Irwin Parallel 250 \$409

AMERICAN UPS 250 \$109 600 \$259 400 \$159 900 \$375 450 \$189 1250 \$729

CD ROM OPTICAL DISKS NEC CD Express \$409 Sony CDU 535 Int. . . . \$279 Sony 7205N Ext. \$455 Sound Blaster Media ... \$499 Toshiba 3301 Ext. \$499

SEAGATE HARD DISKS	
\$229	
\$299	
\$179	
\$189	
\$299	

PLUS HARD CARD

40 MB/50 XL \$299/\$229 127 MB/240 MB . . . \$309/\$519 **CONNOR HARD DRIVES**

120 MB/174 MB \$219/249 209 MB/540 MB ... \$299/\$899

Prices and availability orders accepted without notice. Purchase orders accepted from Qualified Customers.

HOURS C.S.T.
7:30 - 7:30 pm · Mon.-Fri.
9:00 - 5:00 pm · Saturday

Product/.inc. 1970 CARBOY
MT. PROSPECT, IL 60056

Prices and availability subject to change without notice. Purchase orders accepted from Qualified Customers.

FOR ORDERS & QUOTES: 800-548-5105



SHIPPING 708-228-9748 TECHNICAL ASSISTANCE 708-228-1470 We Export! FAX 708-228-0516

FOR OPTIMUM SOFTW PRESS PLAY C

Put the experts to work with Software Training Videos for Windows, Excel, WordPerfect and more.

OVER 70 TITLES TO CHOOSE FROM - CALL 1-800-937-3279 EXT. 10

Windows 3.1

Tom Sheldon guides you through the basics of Windows operation, including terminology, global commands, and starting applications. Tom also demonstrates how to use the many powerful applications and accessories including Paintbrush, Notepad, Write and more, Learn shortcuts not found in the manual, sections, on macros, PIF files, object linking to expand your knowledge.

Beginning Windows 3.1 \$49.95 Windows 3.I Applications \$49.95 Windows Adv. Tips & Tricks \$49.95 **Optimizing Windows** \$49.95

Combination Special Beginning, Applications, Advanced Tips & Tricks, & Optimizing Windows videos



Tom Sheldon author of Windows 3 Made Easy and Windows: The

Complete Reference.

Windows Primer Videos

See Daniel do Windows! Teach Daniel, Teach.

Here's a video for the technically impaired. Daniel Will-Harris tenderly holds your hand through a basic understanding of Windows & how to use it's applications. It's



Introduction to Windows 2 hrs Windows Applications 90 m.

Combination Special **Both Tapes**

00

Daniel Will-Harris author of WordPerfect: Desktop Publishing in Style, and Ventura Tips & Tricks.



\$29.95

\$29.95

Excel 4 N

Basic instruction of Beginning, Intermediate, & Advanced tapes are taught by Dr. Robert Voss. These tapes will help the user understand the operation of this fabulous Windows spreadsheet/database program.

Beginning Excel for Windows \$49.95 Intermediate Excel for Windows \$49.95 Advanced Excel for Windows \$49.95

Reed Jacobson, a certified Microsoft "Partner", teaches the more advanced features of Excel.

Combination - 3 tapes

Names, Arrays, & References \$49.95 Processing Data Files \$49.95



Combination Special

\$29.95



Robin Stark leads users through the basic and advanced features of 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.3.I, Win, &2.4 \$49.95 Intermediate Lotus I23 v. 2.4 \$49.95 Advanced Lotus 123 v.3.1, Win, &2.4 \$49.95 Update from DOS to Lotus for Windows \$49.95

Combination Special 2 tapes - Beginning & Advanced v. 3.I or Windows



author of Using

Windows 3.1 &

Using Excel 4



Robin Stark University of California training specialist and author of The Encyclopedia

of Lotus 123



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 the same day as received with Credit Card guarantee.

Check or Money Order: Business Checks and Money Orders are shipped same

day. 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: For USA orders include the following shipping charges: UPS Ground S5.00, UPS Blue S8.00, Overnight S20.00, Regular U.S. Mail or Canada S8.00. Additional charges for International shipping. Utah residents add 6.25% sales tax. FAX or mail orders to: LearnKey, Inc. 93 S. Mountain Way Dr. Rm. 10

Phone 801-224-8210 FAX 801-224-8211

Orem, UT 84058

ARE PERFORMANCE YOUR VCR!

Other Software Training Videos Available from LearnKey

WordPerfect Videos

Learning WordPerfect couldn't be easier! Karen Acerson, Carolyn Dillon, and Daniel Will-Harris are the expert instructors of this popular and powerful software. These tapes are a great addition to any training program. DOS and Windows versions available.

Beginning WordPerfect 5.I	\$49.95
Interm. WP for Windows	\$49.95
Advanced WordPerfect	\$49.95
WordPerfect Update (DOS)	\$49.95
WordPerfect Tips & Tricks	\$49.95
WordPerfect Macro Magic	\$49.95
Perfecting the Office	\$49.95
WordPerfect DTP	\$49.95

Combination Special Includes: 7 Videos ☐ DOS or ☐ Windows





Karen Acerson author of WordPerfect: The Complete Reference and WordPerfect: From 5.0 to 5.1.

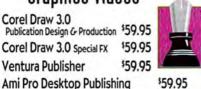


Supercharging DOS	
Applications under Windows	\$49.95
Discover DOS	\$49.95
Using DOS 5.0	\$49.95

Daniel Will-Harris **Graphics Videos**

Corel Draw 3.0 Publication Design & Production \$59.95 Corel Draw 3.0 Special FX \$59.95 Ventura Publisher

Word Desktop Publishing



\$59.95 \$59.95

Netware 3.X

Tim Gendreau, Certified NetWare Level II instructor takes you from the basics of networking to advanced security techniques.

NetWare Basics 70 Min.	\$125
Setting-up NetWare Security 60 MIC.	\$125
Menu & File Server Utilities I works	
Menu & File Server Utilities 2 67 MR.	\$125
NetWare Printing 83 Min.	\$125
Login Scripts 74 Min.	\$125
Custom Menus 33 Min.	\$125
Combination Special \$ 0	700

Includes: 7 Videos

NetWare 3.X Installation 69 Min. \$125 Installing WP on a Network KINA **\$25**

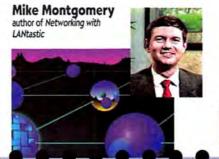


Tim Gendreau Certified NetWare Level II instructor has taught hundreds of professionals the features & power of NetWare.

LANtastic Videos

Getting Started sown	\$59.95
Management & Security 20 Min.	\$59.95
Server Config. & Perf. 50 Min.	\$59.95
Network Printing 35 Min.	\$59.95
Networking Windows 60 Min.	\$59.95

Combination Special All Five LANtastic Series tapes



Harvard Graphics

Mike McClure teaches basic and advanced techniques for creating powerful Harvard Graphics presentations, DOS 3.0 & Windows I.I Versions

Beginning Harvard Graphics \$59.95 Advanced Harvard Graphics \$59.95



Mike McClure Harvard Graphics expert designer and master teacher.



WordPerfect Legal Series Carolyn Dillon teaches basic and

more efficient. 2 hrs. each

Carolyn advanced WordPerfect 5.I techniques Dillón that will help any legal office become

> \$59.95 Legal Office Basics Legal Short Cuts \$59.95 **Document Assembly** \$59.95 Building a Forms Library \$59.95

Combination Special

Includes all 4 Videos 20% off regular price



1-800-937-3279 EXT.10

Circle 206 on reader service card

FIRST SOURCE INTERNATIONAL PRESENTS MORY AND MUCH MORE

Personal Computer Memory

IBM	A COUNTY OF THE PARTY OF THE PA	
PS/1 286, 386SX	Car.	
2MB 92F9935	\$89 4MB 92F9694 \$145	í.
PS/1 Consultant , Es	sential & Expert models 143, 144 &	
	odels except Cxx series	
4MB PN NA	\$159 16MB PN NA \$579	1
PS/2 25/286, 30/28	36, & memory adapter 1497259	
2MB Kit	30F5360\$79	
PS/2 355X; LS, 405X,	502, 555X; LS, 655X; LS, 70, & XStation	
1M8 6450603	\$49 2MB 6450604 \$75	
	21; B61, PS/1 Consultant , Essential &	
Expert models x11, x	r13 & x14, PS/Valuepoint Cxx series	
2MB	6450608 579	
PS/2 355X; LS, 405X,	, SSSX; LS, 6SSX; LS, XStation, PS/	
Valuepoint Cxx series	s & adapter board 34F3011 or 34F3077	
4M3	34F2933 or 87F9977 \$145	1
PS/2 355X; LS, 405X,	PS/Valuepoint Cxx series	
8MB	6450129 \$299	
PS/2 90 XP, 95 XP, P	P75 (pairs), 56, 57 (all), PS/1 Pro M212	3
21/IB	6450902\$85	,
	P75, 56, 57 (all), PS/1 Consultant ,	
	nodels x11, x13 & x14, PS/1 Pro N2123	
	tion/POWERserver 220 series	
	\$149 BMB 6450130 \$299	1
	or 50, 50Z, 55SX, 60, 65SX	
2-8MB W/2MB		1
Expansion boards fo	or all models 70 & 80	
2-14MB W/2MB	34F3077 \$329	1
Compaq		
ProLinea 3/25s; 3/25	525	
2MB 141738-00	11 \$89 8MB 141742-001 \$285	
ProLinea 4/25s, 4/3	3, 4/50	
4 4WD 484E92.00	4 CCC 2MB 484697.004 CDG	

\$179

1MB 141682-001 \$55 2MB 141683-001 \$89 4MB 141684-001 .. \$159 8MB 141685-001 .. \$309 DeskPro 386-20, 20e & 25

DeskPro 386s/16 **4MB Module** 112534-001 DeskPro I Series, 286N; 386N; 386X/20; 20N SystemPro LT Series, ProSignia PC Server 486/33; DX2/66 Portable 486c & M Series expansion boards 4MB 118690-001 ... \$155 8MB 112877-001 ... \$315 roSignia PC Server 486/33; DX2/66

113132-001

16MB 149320-001 .. \$999 32MB 149147-001 . \$2439 Tomb 149320-007 ... 5999 32MB 149747-007 .52439
SystemPro XI (486-50) ... 5799 32MB 136817-001 . \$1599
DeskPro 386-33, 486-33, 8. SystemPro
2MB 115144-001 ... \$99 8MB 116561-001 ... \$289

DELL Power Desktop 325D, 325P, 333D, 333P, 435P, 486P & 486D 1MB 310-2505 559 4MB 310-2507 5149 Powerline Workstation 420; 25; 33; 50; 450DE/2 & 466DE ZMB 310-2466 \$99 4MB 310-2467 \$179 8MB 310-2468 \$319 16MB 310-2469 \$629

Zonith

Z-300/400 Series Z-420/SX, Z-425/SX, Z-433/DX, Z-433/SX
4MB ME-100 \$159 16MB ME-90 \$599
Z-Server 425SE, 433DE, 450DE
4MB ME-432 \$169 BMB ME-102 \$319
Z-Station 325Sh; Sn, 420SEh; Sh; Sn; 25Sh; 33Deh; Dh; SOXEn
1MB ME-70\$49 4MB ME-100\$149
Zenith Z-386/20; 25; 33 & 33E
1MB ZA3800ME \$49 4MB ZA3800MX \$149
Zenith Z-386SX/20, 286LP+, Z-LS
AND WA 2 COT 4 COA

Zenith 486/33ET; 25E 4MB ZA420 . \$189 16MB ZA4200M8 \$619 AST

2MB 500710-004 \$99 8MB 500824-002 .. \$319 Advantage! Plus 486DX/33; DX2-50; DX2-66

4MB 500510-008 .. \$179 8MB 500824-001 .. \$319
Advantage! 3865X/20; 25, Advantage! Pro SX/25, Bravo 3/35s 2MB 500962-001 \$75 8MB 500962-002 .. \$339 tage! Pro 486DX/33; SX/25, Bravo LC 4/25s; 33; 33s; 50d; 66d

4MB 500987-002 \$139 16MB 500987-004 \$499 ım 386/25; 33; 33T, Premium II 3865X/16; 20; 25 w/WPB 500780-003; 002 _______

mium 4/25; 33TE, Server SE 4/33 2MB W/WPB 500718-004; 780-005 ZMB W/WPB \$119 Premium 386/33T, 386SX/16, Premium II 386SX/20; 25

335, 4/50d: 66d, Premium 386/33TE, 486/25; 25E; 25TE; 33; 33E; 33TE, Premium II 386/25; 33, 486/33; 5X/20 Premium Server SE 4/33 SME W/WPB 500780-001 Hewlett-Packard Vectra OS/16S; 20PC, RS/20; 20C; 25, 25C D1542 or 1642A . Vectra 386/16N, 386/20N, 386/25N PC

2MB D2406A \$79 8MB D2404A \$279 Vectra 486PC; 486/25T; 486/35T; 4865/20; 486/25N; 486/ 33N; 486/50N; 486/66N 2MR 02381A 589 8MB D2152A Vectra 386/25; 486/25U; 486/33U; 486/50U; 486/66U \$309 2MB D2381A \$89 BMB D2152A Vectra 486/25N; 486/33N; 486/50N; 486/66N D2676A ...

NEC PowerMate 286/12: SX/16 & SX/20 2MB Kit OP-410-8103 . 599 verMate 5865X/20i; 20vi; 16i; 25i; 486/50i; 486/33i OP-410-2101 \$279 PowerMate 386/33E & 486/25E

OP-410-5101 Laptop & Notebook Memory

AST		Texas Instru	ments
PowerExec 3/25SL, 3/25SL-C and EL	4M8 \$179	TravelMate 3000 (all models)	2MB 579
	8MB \$649	TravelMate 4000 (all models)	4MB \$199
america de North Constitution (no tra	16MB \$1249	TravelMate WinSLC/25	2MB \$79
Premium Exec 286, 386SX/20; 25; 25C	4MB \$129	Toshibo	
Compa	C	T1000SE/LE/XE; 2000, 2000SX; SXe,	2MB \$79
Contura 3/20, 3/25, 3/25c	4MB \$169	T22005X and T1800 Satellite Series	4MB \$159
100000000000000000000000000000000000000	8MB \$309		SMB \$289
LTE 3865/20	4MB 5189	T1200XE, 1600, and 3100E	2MB\$89
LTE Lite 20; 25; 25c, 25e	4MB \$159	T3100SX, 3200SX, and SXC	2MB \$89
Lancard Control Control	8MB \$359		4MB \$149
Me	16MB \$1299	T3200	3MB \$149
LTE Lite 4/25c	4MB \$219	T3300SL	4MB \$169
44	8MB \$359		8MB \$469
SLT 286	4MB \$259		16MB \$815
SLT 386s/20	4MB \$179	T4400 and T6400 (all models)	4MB \$169
IBM	Ship was a second		8MB \$309
ThinkPad 500	2MB \$159		16MB \$615
	SMB \$429	TS100	2MB \$89
PS/2 CL57SX, ThinkPad 700 and 700C	4MB \$219	TS400, TS200; TS200C and T8500	2MB \$89
13,23,21,24,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1	8MB \$369		BMB \$279
NS1 Notebook (All)	2MB \$179	Zenith	
	4MB \$249	Z-Note 320L 320Lb, 325L 325Lc . C-1	2MB \$169
LAOSX, N33SX and PS/Note 182	4MB \$135	27.5	8MB \$369
LAOSX and PS/Note 182	8MB \$285	Z-Sport 4205, 4255	4MB \$189
PS/Note N4SSL	2MB \$136	Z-Sport 3255	2-6MB \$139
NEC		2 16111111111	4MB \$249
Ultralite & Cellular Workstation 286F	4MB \$369	MastersPort 386SL, SLC, SLe	2MB \$99
UltraLite & Cellular Workstation SX/20	2MB \$179	MastersPort 386SX	2MB \$109
Oldatite & Celimar Horistation SA/20	8MB \$599	SupersPort SX; 286e; SlimsPort	2MB \$139
UltraLite III, SL/2SC	2MB \$119	SupersPort 286e: SlimsPort	4MB\$279
VILLALITE III, SUZSC	4MB 5119	We also carry a large inventory of memor	unaradar for other
UltraLite SL/20, SL/20P	2MB \$119	name brand laptop and notebook syste	
VILLEDIE SEZ ZU, SEZ ZUP	6MB \$289	our sales staff for information on your	
	omp 2289	our seles start for intormation on four	specific induct.

Laser Memory

Hewlett Packard LaserJet IIIsl, 4, 4M & X1300	IBM Laser 4029 All Models
4MB C2065A \$149 8MB C2066A \$299	4MB 1183335 \$12
Hewlett-Packard LaserJet IIP, III, IIIP, IIID	Canon LBP-4, 4Lite, 4Plus
2MB 334758 \$99 4MB 334778 \$159	1MB S63-2230 \$119 2MB N/A \$16
Hewlett-Packard LaserJet II & IID	Canon LBP-III & BIII Plus
2MB 33444B \$99 4MB 33445B \$159	2MB 563-2350 \$249 3MB 563-2360 \$29

CPU Upgrades

Upgrade your system to 386 or 486 power!



ngston processor upgrades Improve the performance of DOS 5.0, Windows, OS/2 and other business, graphic and CAD/CAM programs without purchasing a new

SX/Now!	
25MHz (SX) \$199	53MHz (SX) \$215
SLC/Now!	
20MHz (SLC) \$129	33MHz (SLC) \$215
50MHz (SLC)	
486/Now!	
25MHz (SX) \$429	33MHz (DX) \$635
MICTOMASTER	
25MHz (SX)5829	33MHz (DX) \$1299
With 4MB add \$149	With 8MB add \$285
ATMaster	
25MHz (SX)\$999	33MHz (DX) \$1439
With 4MB add \$149	With 8MB add 5285

Fax Modems

COMPUTER PERIPHERALS, INC.



\$199

PC Magazine says, "The Viva's datatransfer performance was excellent!" PC Magazine December 8, 1992

VVVa internal M

Megahertz Megahertz

For AST, Compag, IBM, Sharp, TI, Toshiba, Zenith and many other Laptop and Notebook Systems.

PCMCIA 2.0 Internal FAX/Modems 14,400bps FAX/Modem, Autosync 24/9600bps FAX/Modem Internal FAX/Modems w/MMP-5 & V.42/V.42bis 14,400bps FAX/Modem, Autosync 24/9600bps FAX/Modem \$219 External Pocket Modems for any RS-232 Serial Port 14,400bps FAX/Modem, Autosync ... 24/9600bps FAX/Modem \$579

Video Cards

Diamond Computer Stealth Pro 1MB \$249 Stealth Pro 2MR

SIMM Modules

1	Industry Standard 30-pin SIMMs	9
1	1MB x 9-70 or BOns, Fast Page Mode	
۱	4MB x 9 70 or 80ms, Fast Page Mode	\$129
۱	36-Bit, 72-Pin SIMMs	
- 1	512K x 36-70 or 80ns (2MB)	579
	1MB x 36-70 or 80ms (4MB)	\$145
П	2MB x 36-70 or 80ns (8MB)	\$289



- 100% compatible in form, fit, & function
- All products user installable
- Installation instructions included
- Toll-free technical support
- Thousands of items in stock
- Manufacturer's warranties
- Corporate PO's, APO/FPO's welcome
- Government and Educational pricing
- International orders welcome
- Special volume pricing
- 24-hour fax line
- Same day shipping
- Overnight delivery available
- No surcharge on credit cards

CALL FOR ANY MEMO We stock upgrades for over 1700 computers and printers GRADE NOT LIST







TOLL FREE FROM THE UNITED 800/647-9866

INTERNATIONAL

714/588-9866 FACSIMILE

714/588-9872

Business hours:

Monday - Friday, 8am-5pm, P.S.T. Saturday, 9am-3pm, ORDERS ONLY



Mail or fax orders to: First Source International, Inc. 7 lourney Aliso Viejo, CA 92656

Terms and Conditions: Memory products are third party, manufacture numbers are for your convenience. Preight charges are non-refundable. A EMA number is required for all returns. All non-detective returns, composed, relaxed, or cascelled orders, will be subject to a 20% restorbin fee. Prices and availability are subject to domain without notice. Purchase prices at the time or order are final. First Source international cannot be ile for errors in typography or photography. He will beat an

We'll meet or beat any advertised price!

CALL THE UPGRADE EXPERTS TOLL FREE 800/647-9866

The Bottom Line: Keep It Simple, Smarty

n animated character in the dazzling tutorial for Improv says, "There's only one problem to solve. Calculating the bottom line." Improv, Lotus's ingenious reinvention of the spreadsheet, eliminates the complexities of spreadsheet life. Guide Line, Symantee's answer to the obscurities of project management software, is also easy to use. Autodesk's Office Layout package greatly simplifies the management of office space and furnishings. And the trackball on PC Brand's new Leader-Book Pro is simply mahvelous! (So's the color monitor.)

The bottom line? Each product promises to increase my productivity by making things less complicated.

Improv for Windows

Improv is so simple to use, it's surprising no one thought of it before. More than just a reinvention of the spreadsheet, Improv gives you a new way to handle and manipulate data. If you deal with numbers at all—especially if you've never used a spreadsheet program—you will want Improv.

Yes, there are still rows, columns, and cells in a ledger-sheet-like layout. But that's where the resemblance to your average spreadsheet ends. All cells are named in English, and you refer to the data they contain by the name of the cell or item. An item can be named "miles per gallon," and you can assign a formula to it, also in English—for example, "miles per gallon = miles/gallons" instead of "A1=B1/C1."

You can locate formula or logic errors by reading your own words, not obscure cell references. What's more, being able to track the links among your numbers with plain English means you're likely to think more logically about how your figures are laid out and how they should be calculated and interpreted. All the

By Thom Foulks

calculations used on a given worksheet are shown in a scrolling display at the bottom of your screen.

Improc will allow you to manipulate your worksheet in almost every conceivable way. It lets you drag items around the sheet wherever you want without losing the relationships among them. You can apply

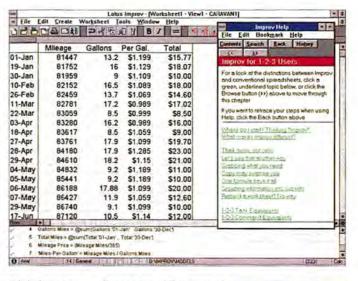
the same formula to multiple item locations with just a couple of mouse clicks: There's no retyping, no copying.

Learning to use *Improv* is a delight, thanks to the interactive tutorial that serves as an introduction to the program. *Improv*'s tutorial is the most impressive graphical demonstration I have seen on a PC.

Such software power, of course, must be matched with hardware: At minimum, *Improv* requires a 20-MHz 386 PC with 4MB RAM (Lotus recommends a 33-MHz 386 with 6MB RAM), a VGA monitor, and a mouse. If you haven't upgraded to this kind of horse-power yet, *Improv*'s simplicity and dynamic display powers will make you happy to do so. *Improv*'s list price is \$495, but you should look for introductory offers. Most assuredly, *Improv* is a Foulks Favorite.

Guide Line and Guide Line Maker

A couple of years ago, when I attempted to use a project management program, I got stumped on one of the first questions: Did I want a Gantt chart or a PERT chart? I knew that either would let me see the entire project in chart form, but I didn't know which one I wanted, and the software wouldn't let me proceed until I chose. Talk about



frustrating. All I wanted was a schedule—I didn't want a college degree in scheduling.

Symantec is seeking to change that situation by introducing two new products that work as Foulks's Favorite
is Improv, Lotus's
brand-new approach
to spreadsheets.

front ends to any of four popular project management packages: Symantee's Time Line 1.0 for Windows, Time Line 5.0 for DOS, On Target, and Microsoft's Project for Windows.

The \$149.95 Guide Line is a package of 16 ready-to-use guides for common projects, such as putting together a marketing plan, setting up a network, or relocating an office. Guide Line can be purchased alone and is bundled with the \$699 Time Line for Windows.

The \$499 Guide Line Maker is a project development tool that helps you build other more specific guideline project models. When you use either product with a project management package, you can develop a full-blown project schedule that displays all the resources, time dependencies, and charts you need.

Using a LAN installation guideline, I developed a workable Gantt chart installation schedule for a ten-station local area network in about 15 minutes.

BUSINESS FIXTURES

The Guide Line template asks you questions—in this case, how many workstations, length of the cable, and so on—with predictable options to be checked if you want to include them. Guide Line then produces a template file. To build a complete schedule, you must feed the file into one of four project management packages Guide Line supports. You can also import an existing project management schedule and convert it to a template for distribution.

Office Layout

Using a CAD (computer-aided design) product to lay out an office floor plan isn't a new idea, but drawing a symbol for every stick of furniture is tedious. Autodesk makes this otherwise complicated project a lot easier with a specialized \$149 version of its top-drawer *Generic CAD* program. *Office Layout* has a greatly simplified user interface, predrawn office equipment symbols, and an equipment inventory system.

You start by drawing your office walls, using a crossbar cursor to indicate their location, with a real-time display of your layout's dimensions. Office Layout knows how to draw doors and their swing paths—just point to a door's location and choose its width. Then you select from more than 200 office object symbols—chairs, desks, desktop equipment, and portable partitions—experimenting with their placement on screen. I've already begun looking at various redesigns of my office.

The inventory system is particularly useful and gives Office Layout an edge over regular draw programs in creating floor plans. As you choose and rearrange symbols in your office design, you also specify size, price, occupant, and so on, so that your plan holds the data for inventory summaries automatically. That data can be exported to Improv or any other spreadsheet program.

Although Office Layout gives you highly graphical representations with on-screen display measurements that go all the way down to 1/16 inch, it does not use the Windows interface. That, according to the Autodesk folks, means Office Layout can run on an XT equipped with a hard drive and a graphics card. (I looked at the product on my 33-MHz 386 machine with 8MB RAM, so screen response was impressively snappy and crisp, even on zooms to desk-drawer detail.)

486/SX Dual Scan Color LeaderBook Pro

Evaluation units of notebook computers have wandered in—and out—of my office for months, and all have lacked one critical

POWER TIP no. 288

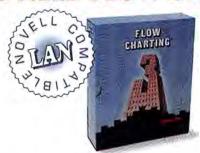
Creative Comments in WordPerfect for Windows

If you want multiple paragraphs in a WordPerfect for Windows comment, don't create the comment in the comment dialog box. Instead, type it in as normal text in the document area. When complete, block the comment and select Tools • Comment • Create. The highlighted text will become a comment, but one with hard returns.

George Salvador Houston, Texas

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

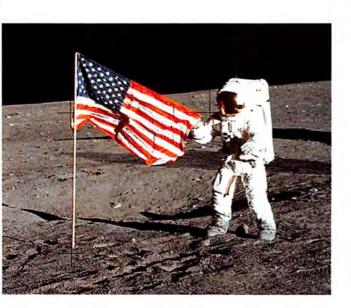
Novell is a registered trademark of Novell, Inc.



Excellence in charting the flow of ideas!

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

YOU PURCHASED A CD ROM DRIVE TO EXPLORE NEW FRONTIERS ...





WHY NOT START WITH THE LAST TWO.

SPACE

A visual history of manned space flight, this CD ROM contains mission profiles, time lines, and histories by acclaimed author Anthony R. Curtis. Also included are 450 megabytes of narrated QuickTime movies on such programs as Mercury, Gemini, Apollo moon launches, the Shuttle program, and Space Station Freedom. Special



sections cover topics such as space-based science experiments, spacewalks, and life in zero gravity. Macintosh and Windows versions available. \$49.95

OCEANLIFE

Navigate the life-filled reefs of the southwestern Pacific and discover more than 40 species of exotic tropical fish native to the islands of Fiji, Tonga and Vanuatu. Ocean Life is a QuickTime-based field guide, complete with movies, text, and maps. Based on the field work of Robert F. Myers Ph.D. As a bonus we have included

the original high resolution QuickTime files for use in your own presentations. Macintosh and Windows versions available. \$39.95



SUMERIA

For more information or for mail orders, direct your requests to: Sumeria, Inc., 329 Bryant Street, Suite 3D, San Francisco, CA 94107.

All orders payable in U.S. dollars. Add \$2.50 per CD for shipping and handling. Foreign orders add \$5 per CD for shipping and handling.

For phone orders please have your Visa or Mastercard ready. Fax orders can be made by calling 415.904.0888. California residents add applicable sales tax. Please allow 4 to 6 weeks for delivery.

To Order, Call 415.904.0889

BUSINESS FIXTURES

element: a functional pointing device. I've been desperate for something to use instead of a mouse, especially when I'm cruising at 35,000 feet or I'm in a cab that's stuck in traffic. My lean-and-mean mobile work style rules out any of those plug-in, cable-dangling, clamp-on units. So far, all the built-in pointing devices I've ever tried have been too small, with tendencies to jiggle and overspin.

Just when I was about to give up, enter

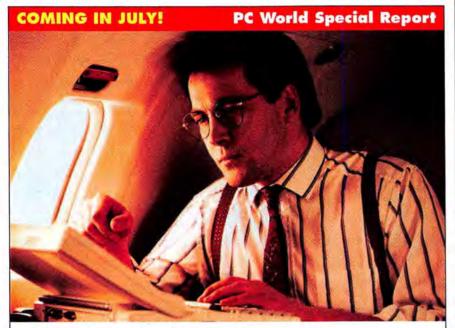
PC Brand with the 486/SX Dual Scan Color LeaderBook Pro. The 6.6-pound portable LeaderBook Pro has a solid, comfortable, centrally mounted trackball that can be manipulated by either hand, or both if you so desire. (Imitation remains the most sincere form of flattery: PC Brand freely admits that the broad platform that holds the trackball was "borrowed" from Apple Computer's highly successful PowerBook series of portables.)

Also lacking in many portables is a screen that doesn't strain your eyes. PC Brand's "dual scan" LCD scores again. Its passive-matrix design makes two simultaneous vertical sweeps across the 9.5-inch diagonal surface. The company says this produces a 20-to-1 contrast ratio rather than the 13-to-1 ratio common to most other passive-matrix designs: The result is a brighter picture. The colorful screen is indeed quite comfortable to view in room light, so you don't have to squint.

My unit, complete with 4MB RAM and a 120MB hard disk, carries a \$2595 price tag. A 2400/9600-bps fax-modem is available for \$199, and a proprietary 4MB RAM expansion module costs \$300. (Monochrome models of the LeaderBook Pro series are priced as low as \$1795.) I'd be happy to pay that just for the trackball.

- Guide Line, Guide Line Maker Symantec Corp.; 800/441-7234, 408/253-9600
 Reader service no. 712
- Improv for Windows Release 2.0 Lotus Development Corp.; 617/577-8500 Reader service no. 713
- Office Layout 1.0 Autodesk Retail Products; 800/228-3601 Reader service no. 714
- 486/SX Dual Scan Color LeaderBook Pro PC Brand Inc.; 800/722-7263 Reader service no. 715

Thom Foulks is a contributing editor for PC World.



Business Traveler's Guide to Mobile Computing

Our editors have been on the road again, preparing a special 20-page 'hands-on' report on the realities of Mobile Computing for business travelers. In it, you'll find these valuable articles:

- PC World examines the 'air-go-nomics' of using notebook computers aloft.
- Buyer's Guide to 22 notebook computers you can take with you.
- A survival guide with tips for successful computing 'on the road' in hotels, airports and other offices.

Don't miss this important section!

PC World - July issue



POWER TIP no. 289

Faster Finds in Excel

Excel's Formula • Find feature helps you find a string in a worksheet. But if you're looking for the right instance of that string, calling up Formula • Find over and over, even with the <Shift><F5> hot key, can be a drag. In these cases, Formula • Replace is a lot quicker. Just type the string into the Find What box and click Find Next. If the first find isn't what you're looking for, click Find Next again. Just don't click Replace or Replace All. When you find the cell you want, click Close.

Rex Farrance Associate Editor

MOUSE XMS HIGH DOS

INITIALIZE HMA WINDOWS 640K

386SX PAGEFRAME CACHE LIM EMS

DPMI

CD ROMS UMB 386MAX

DITATITYAS



ntroducing 386MAX Version 7.

If you use DOS applications under Windows, you know how quickly memory gets used up. Which is why you should explore new 386MAX® Version 7, the most effective memory manager in the universe.

That's because new 386MAX is so well integrated with the workings of DOS, you actually get better, more flexible DOS under Windows than with DOS alone. Including up to 736K of conventional memory in each

DOS session thanks to our powerful new Windows features. That's 100K more than you'll get even with the improved memory management built into new DOS 6. Plus, new 386MAX makes it easy to get top performance from each DOS application in Windows by guiding you effortlessly to the optimum configuration for your system.

MEMORY

We even make DOS itself better, especially if you move to new DOS 6. By freeing up extra memory for applications, and for using more of the 200K of the built-in DOS 6 utilities. By giving you more intelligent, more automated memory management features, including new QMT, the easy, reliable way to test the integrity of your memory.

And by providing new MultiConfig Maximize which, unlike DOS 6, ensures fully optimized memory in a number of different boot configurations.

> So if you're looking for a memory manager that really shines, there's no need to search the galaxies. Instead, get new 386MAX 7 for any 386, 486 or Pentium"-based PC for just \$99.95. Or get BlueMAX™ 7 for genuine IBM brand PCs at just \$124.95.

Call toll-free today to order direct, or for our special limited time \$29.95* memory

> manager upgrade offer. 1-800-473-0486.

The Intelligent Memory Manager™

Circle 236 on reader service card

VGA MOUSE TSRs HIGH DOS EGA INITIALIZE DPMI MODEMS



RAM



PAGEFRAME

© 1993 Qualitas. Qualitas, 7101 Wisconsin Avenue, Suite 1386, Bethesda, MD 20814. All company and product names are trademarks or registered trademarks of their respective owners. System requirements: Any 386, 486, or Pentium micro-processor based PC or PS/2, min. 256 KB of extended memory, DOS 3.3 or higher, high density floppy disk or hard disk drive. "plus \$6.95 shipping & handling in the processor of the statement of the st in continental U.S.

<u>Flow</u> charting

Easier and Faster than ever before!

HavenTree has cranked up the power on EasyFlow with a release that lets you create your own shapes, offers a host of new text handling features, exports charts in a wider variety of graphics formats than any other flowcharting program and supports more printers and plotters than any other DOS-based competitor. We've even given our already highly intelligent line router an IQ boost. These new and improved features, combined with those listed below, make EasyFlow the World's #1 flowcharter.

- · Create new shapes or modify existing ones.
- Automatic off-page connectors and adjacent-page mapping help make complex charts easier to read.
- Automatic page borders and numbering.
 - Automatic text formatting.
 - · Context-sensitive help.
 - Support for LIM expanded memory.
 - Runs on your network.
 - Exports charts to ASCII, CGM, DXF, EPS, GEM, PCX, HPGL, SYM, TIFF and WPG file formats.
 - Charts compatible with EasyFlow Mac version.
 - Improved color output HP DeskJet 500C, HP PaintJet, Epson LQ2550.
 - · Tutorial included.

Introducing EasyFlow
8.0
(for DOS)

EasyFlow is also available for the Mac

See your dealer today or call now:

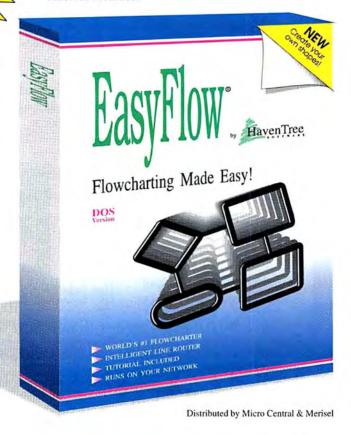
1-800-267-0668 ext.47

(In Canada: 613-544-6035)



HavenTree Software Limited P.O. Box 470-M. Fineview, NY 13640-0470 AD0007-930107

Circle 179 on reader service card



Underground, in a Maze, and on the Green

he popular *Ultima* fantasy series has gone underground. No, you don't have to lurk around the bus station to buy the latest version. Adventurers continue to roam the highways and villages of Britannia in *Ultima VII—The Black Gate* (reviewed here in January). But would-be wizards and coffee-break sword fighters get an opportunity to explore the subterranean depths with *Underworld II—Labyrinth of Worlds*.

The plot? Okay, you've saved Britannia eight times already, but suddenly a huge black-rock gem encases the castle of Lord British, and the hapless deadbeats who live there need you to beat back the bad guys one more time. You find yourself exploring dark corridors, gathering spell-casting runes and magic potions, wielding medieval weaponry and armor, and enjoying stylized conversations with seers, sorceresses, and sidekicks. The scope of this adventure is astonishing. Each of the eight facets of the black-rock gem opens onto a different plane of reality: prison towers, ice caverns, distant cities, exotic worlds, and alien dimensions.

Underworld II employs a distinctly different graphical approach, too. Instead of the familiar spy-eye viewing angle where you float just over someone's head, you see *Underworld* from the hero's or heroine's point of view.

A well-designed, mouse-based interface lets you move through the dungeons as smoothly as if you were walking. Simply swing your cursor to the side to change directions, or raise it toward the top of the screen to run faster. And you can throw away that graph paper, courtesy of an auto-map that records your explorations automatically. Combat is equally intuitive. Aim your weapon with the mouse, hold down the right button to gather power, and release the button to thrust or parry.

By Michael Goodwin

On-screen icons allow you pick to up and manipulate objects, although these controls are awkward to use.

If you're looking for a radical reinvention of swords and sorcery fantasy, better look elsewhere: Labyrinth of Worlds is basically a retread of Dungeons and Dragons. But its size and splendor make for a rewarding adventure.

Egg-Zackly Right

At first *Contraption Zack* looks simple: It's your first day as a repairman at Gadgetco, but already you're in a world of trouble. There are major malfunctions everywhere, and your fellow workmen have "borrowed" your tools. Your job: Show 'em who's boss!

Zack is built around an elaborate sixlevel, 60-room maze, but getting through it requires much more than just drawing a map. The heart of Contraption Zack is a series of logical puzzles. None of the puzzles requires special equipment, but their very simplicity is what makes them so maddening-and so irresistible. You know there's a way to get through the doorway to the next room. If the blue button lowers the blue cones but raises the yellow cones, maybe you can pass the yellow cones first and then....The modular design is also appealing: Once you've beaten one puzzle, you can save the game and go to the next when you're ready.

Graphics are relatively crude—much like an arcade game—and the interface is a bit clunky. Cursor keys move Zack, but sometimes a horizontal key moves him diagonally—and vice versa. Not all the malfunctions are in Zack's puzzle world: The <Esc> key is supposed to display the main menu, but in my experience it didn't always work. Still,



an elegance to the game's underlying design makes up for flaws in its controls. *Contraption Zack* is highly appealing, particularly for short coffee breaks.

Straight Into the Trees

It must be the year for golf; quite a few PC golf simulations are reaching the stores. In addition to Fuji Golf (part of Micro-

soft's Entertainment Pack 3, reviewed last month), there's David Leadbetter's Greens from MicroProse and Links 386 Pro from Access.

Greens is supposed to help you improve your game with play-by-play advice from big-time golf instructor Leadbetter, who says cryptic things such as, "Remember-never up, never in" when you miss a putt. He also reminds you of the importance of proper stance, tee height, club selection, ball spin, and so on. To swing, you click your mouse three times-once to start your backswing, once to start your downswing, and once to choose the instant of contact with the ball. While I find it hard to believe that anything you do with a mouse and your PC will have the slightest effect on what you do with a golf

Underworld II
welcomes you to the
chambers of Lord
British. The icons on
the lower right let
you pick up objects
and use them.



LINKS 386 PRO SHOWS UP TO FOUR VIEWS. Here, two righthand frames depict the green and a spy-eye shot of the hole.

club on the fairway, I don't imagine this simulation will do your game any harm.

Once you manage to hit the ball, you're rewarded with an incredible array of real-time visuals that follow it as it flies toward the green—or, in my case, straight into the trees. The "camera" angles are marvelous. This part of *Greens* is major fun. You can choose to play against one or more comput-

er-generated opponents, on one of six courses, and in 11 different kinds of games. You can even play against another human being via modem, assuming that you both have copies of the software.

Links 386 Pro from Access shares some important features with Greens: You click your mouse to hit the ball, for example. But in most ways it takes a different approach. No on-screen pro gives you advice, and there's less attention to the-

oretical niceties of form. But the biggest distinction is graphical. *Links* shows you the golf course—including trees, grass, sky, and buildings—at virtually photographic resolution. Moreover, you can display four views at a time, including a high-angle overhead shot from which you can zoom in.

The downside to all of this photo-realism is that it's slow. Links 386 Pro can take as

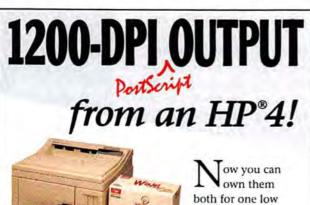
long as 30 seconds to repaint the screen after every shot. Nevertheless, when you tee off on *Links*' gorgeous super-VGA rendering of Hawaii's Mauna Kea course (sold separately), you may decide that its breathtaking beauty more than makes up for the slow-motion graphics. Anyway, golfers aren't supposed to be in a hurry.

 Contraption Zack \$39.95; Mindscape; 800/845-8698

Reader service no. 600

- David Leadbetter's Greens \$59.95;
 MicroProse Software; 410/771-1151
 Reader service no. 601
- Links 386 Pro \$69.95, Mauna Kea Championship Course \$29.95; Access Software Inc.; 800/800-4880
 Reader service no. 602
- Underworld II—Labyrinth of Worlds \$79.95;
 Origin; 800/245-4525
 Reader service no. 603

Michael Goodwin is a contributing editor for PC World. He can be reached as MGOOD-WIN on PC World Online (see page 10 for more information).



LaserJet® 4 + WinJet™ 1200 =

Both for just \$2295!

- 1200-dpi, Camera-Ready Output.
- PostScript*Language Compatibility.
- The Fastest Windows Printing.
- ◆ 50 TrueType" Fonts.
- · No More Font Downloading.
- Revolutionary Host-Based Design

LASERMASTER®

ow you can own them both for one low price. When you combine the new LaserJet 4 with LaserMaster's WinJet 1200 upgrade, you get camera-ready copy plus a host of other amazing features.

Call for the participating dealer nearest you.

800-365-4646 (dept. 33P)

2. 1993 LaserMaster Corporation. LaserMaster, the LM logo, and Winjet are trademarks of laserMaster. All other products are trademarks of their respective holders. Prices available in the U.S. only and subject to change, For European information, call (31) 2503 22000 or (31) 2503 31240.

\$50,000 World Class Contest

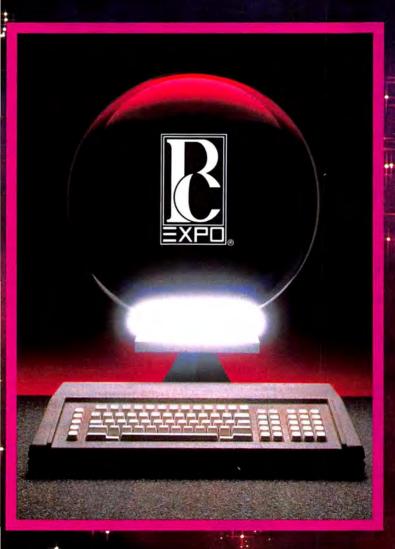
Oops, you went too far!



Turn back to page 95 and cast your vote for the chance to win a super 486 desktop system and other top-rated hardware and software products FREE!

You pick your dream system-we give it away!

KEY INTO THE FUTURE...



AT PC EXPO TODAY

ravel into the next decade as PC EXPO embarks on an entirely new era of computing. You'll journey into the future of Windows, pen-based computing, multimedia and open systems. You'll tour the more than one-half million square feet of exhibition space showcasing a universe of the latest programs and services. And you'll explore a galaxy of new products that link today's information services with tomorrow's innovative technologies.

Catch a glimpse of the future at PC EXPO

JUNE 29, 30 & JULY 1, 1993

JACOB K. JAVITS
CONVENTION CENTER

11th Avenue at 34th Street New York City

For more information call today! 800-829-3976 ext. 9216

PC EXPO IN NEW YORK

It's the one computer trade event guaranteed to leave you light years ahead of your competition.







& Get Smarter Here!

Look for IDG Books

B. DALTON BARNES & NOBLE BOOKSTOP/BOOKSTAR CROWN/SUPER CROWN COMP USA ENCORE SOFTWARE ETC. WALDENBOOKS WALDENSOFTWARE

lected Titles Available at:

BIZMART OFFICE DEPOT OFFICE MAX STAPLES

Alaska

FAIRBANKS Baker & Baker Booksellers Two locations

Big City Books Arizona

PHOENIX Fast Micro, Inc.

NORTHERN CALIFORNIA

BERKELEY Cody's Books MICROWORLD Moe's Bookstore Whole Farth Access CAMPBELL The Booksellers CAPITOLA Capitola Book Cafe CHICO Computer Warehouse Tower Books CITRUS HEIGHTS Computers 4 Less D+G Computers
Tower Books #323
CONCORD Tower Books Whole Earth Access A Clean Well Lighted Place For Books Stacey's DAVIS The Avid Reader U.C.D. Bookstore **EMERYVILLE Diesel A Bookstore**

LARKSPUR A Clean Well Lighted Place For Books MENLO PARK Keplers Books & Magazines MILL VALLEY Depot Bookstore & Cafe MILPITAS Town Center Book Gallery MONTEREY

Pioneer Bookstore-Cal State

HAYWARD

Hayward

PC People MORGAN HILL Town Books of Morgan Hill MOUNTAIN VIEW Printers, Inc. OCEANSIDE

Computer Books For Less

PALO ALTO Printers, Inc. Stacey's Bookstore PETALUMA Buerg Software & Computers REDWOOD CITY Computer Attic SACRAMENTO Hornet Bookstore

Tower Books **Whole Earth Access** SALINAS Computer Works SAN FRANCISCO

Franciscan Shops Stacey's-**Embarcadero** Stacey's-Market Street Whole Earth SAN JOSE Spartan Shops San Jose State

Whole Earth Access

SAN MATEO Tower Books Whole Earth Access SAN RAPHAEL **Books Revisted** Whole Earth Access SANTA CRUZ Bookshop Santa Cruz SANTA ROSA Bits & PCs Monterey Bay Computer Works

SONOMA
The Sonoma Computer Store STOCKTON mputer Wareho

Perfect Computer Center University of the Pacific SUNNYVALE **Action Computer and Surplus** VACAVILLE

SOUTHERN CALIFORNIA

ALHAMBRA Alhambra Bookstore ARROYO GRANDE **Books West** BAKERSFIELD **Books West** BURBANK P.C. Book Nook CLAREMONT Huntley Bookstore ESCONDIDO PC Warehouse Computers FULLERTON Titan Shops-Cal State Fullerton GLENDALE Computer Palace IRVINE Irvine Sci-Tech Books **U.C.I.** Bookstore

LOMPOC **Books West** LOS ANGELES A.S.U.C.L.A. Bookstore **OPAMP Technical Books** U.S.C. Trojan Bookstore MORENO VALLEY Minco Computers
PASO ROBLES

Barger Computers Cal Tech Bookstore **Vroman's Bookstore** RIVERSIDE **Cardinal Computers** U.C.R. Bookstore

SAN DIEGO Aztec Shops Ltd. Byte & Floppy Computers Byte Gallery Datel Computers **MicroCity Computers** San Diego Technical Books 8.M.T. Computers SAN LUIS OBISPO **Books West Earthling Bookshop** SAN MARCOS Computer Depot SANTA ANA A.C.P. Super Store

Chaucer's Rookstone Earthling Bookshop UPLAND

SANTA BARBARA

Software Centre International

Colorado

DENVER **Tattered Cover** ENGLEWOOD SoftPro Books COLORADO SPRINGS Mckinzey-White Booksellers

Connecticut

HARTFORD Huntington's Bookstore MANCHESTER Reed's Rookstore NEW HAVEN Yale Coop STORRS U Conn Coop

Delaware

NEWARK University Bookstore

District of Columbia

Relter's Scientific & Professional

Florida

BOCA RATON I lherties

Georgia

ATLANTA Chapter Eleven Books Engineer's Bookstore Georgia Tech Bookstore Oxford Bookstore MARIETTA Micro Center

Hawaii

HONOLULU Honolulu Book Shops, Ltd.

Illinois

CHAMPAIGN Pages For All Ages CHICAGO Kroch's & Brentano's **Junction Book Store**

NEW ENGLAND

All locations: **Royal Discount Bookstores**

Massachusetts

BOSTON **Boston University Bookstore** Museum of Science Waterstone's BROOKLINE **Brookline Booksmith** BURLINGTON SoftPro Books CAMBRIDGE Accessories Plus Harvard Coop MIT Coop Quantum Books Wordsworth WALTHAM

Maple Book Co.

Tatnuck Booksellers & Sons

MINNEAPOLIS Baxter's Books Odegard Books

Missouri

ST. LOUIS Software Plus The Library, Ltd.

New Mexico

ALBUQUERQUE Page One Newsstand

New York

ALBANY **Book House of Stuyvesant Plaza** HUNTINGTON **Book Revue NEW YORK** Barnes & Noble/E. 18th St. Classic Bookshop Computer Book Works Cooper Square Books New York University Book Center

New Jersey

CLINTON **Clinton Bookshop**

Ohio

COLUMBUS Micro Center MAYFIELD HEIGHTS Micro Center SHARONVILLE Micro Center WESTERVILLE Micro Center

Oregon

CORVALLIS **OSU Bookstores** FLIGENE Libra Books/Book Mark PORTLAND **Powells Technical Bookstore** Tower Books SALEM Jacksons Books

Pennsylvania

KING OF PRUSSIA Gene's Books PHILADELPHIA **Quantum Books** ST. DAVIDS Micro Center

Rhode Island

PORTSMOUTH Mac & PC Shop PROVIDENCE **Brown University Bookstore** Software Center of Rhode Island

Texas

Taylors All stores

Virginia

FAIRFAX Micro Center

Washington

BELLEVUE Tower Books SEATTLE Elliot Bay Book Co. **Tower Books**

Wisconsin

APPLETON Conkey's Bookstore MILWAUKEE Harry W. Schwartz Bookshop

CANADA

All locations: **SMITHBOOKS** Coles Bookstores The Book Company ALBERTA All locations: **London Drugs** Overwaitea/SaveOn Foods **EDMONTON Edmonton Computer Books** Audrev's Books Softwarehouse (West) Inc. Greenwood's Bookshoppe Ltd. CALGARY Calgary Computer Books The Knowledge Source

British Columbia

All locations: **London Drugs** Overwaltea/SaveOn Foods VICTORIA Munro's Book Store VANCOUVER Siliconnections Books Granville Book Co.

Saskatchewan

REGINA **Book & Brier** Golden Mile Plaza

Manitoba

WINNIPEG Copperfield's Computer Books

Quebec

MONTREAL Camelot Info-Place VIIIe Marie Camelot Info-Place Phillips Coles 100

Ontario

TORONTO **Arkon Electronics** University of Toronto Bookstore World's Biggest Bookstore Classroom Computers Computronix Data Center Odyssey Computer Books & Software

Nova Scotia

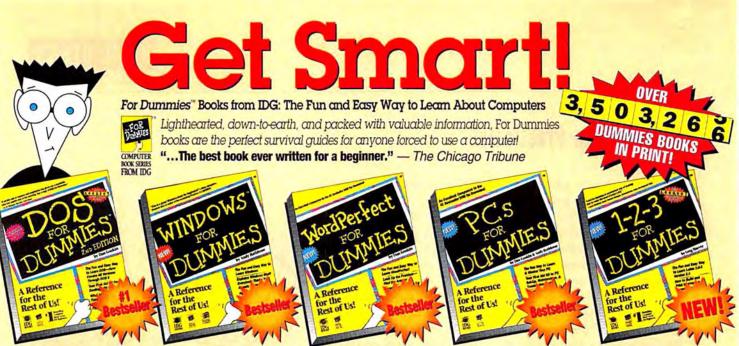
HALIFAX The Book Co. Roswell Computer Books

The Book Co.



The World of Computer Knowledge

Look for IDG Books at these fine stores, or for more information call 1-800-762-2974



DOS For Dummies, 2nd Ed." by Dan Gookin

1-878058-75-4 \$16.95 US/\$21.95 Canada Windows For Dummies" by Andy Rathbone 1-878058-61-4

\$16.95 US/\$21.95 Canada

WordPerfect For Dummies by Dan Gookin

1-878058-52-5 \$16.95 US/\$21.95 Canada PCs For Dummies" by A. Rathbone & D. Gookin 1-878058-51-7

\$16.95 US/\$21.95 Canada

1-2-3 For Dummies" by Greg Harvey 1-878058-60-6 \$16.95 US/\$21.95 Canada

Get Smarte



PC World DOS 6 Handbook. 2nd Edition

by John Socha, Clint Hicks, & Devia Hall

Master DOS with this complete tutorial and reference to DOS Versions 2-6. Features a complete DOS Command Reference, plus expert advice on the new DOS 6 features. Includes over a dozen DOS utilities on disk, including Norton Commander Special Edition.

1-878058-79-7 \$34.95 US/\$44.95 Canada, includes one 3 1/4" disk

PC World Microsoft Access Bible

by Cary Prague & Michael Irwin Let database experts Cary Prague and Michael Irwin give you the key to Microsoft's hot new database for Windows! A complete tutorial and reference with lots of expert tips and techniques. Includes a complete, customizable database application on disk.

1-878058-81-9 \$39.95 US/\$52.95 Canada, includes one 3 1/2" disk

Hard Disk SECRETS

by John M. Goodman, Ph.D. Cure hard disk problems before they start with this indispensable book/disk. Features 100s of hard disk survival tips and SECRETS, with up-to-date coverage of DOS 6 and SpinRite 3.1. Includes FREE disk of hard disk utility software, hand-picked by the author.

1-878058-64-9 \$39.95 US/\$52.95 Canada, includes one 3 1/4" disk

DOS 6 SECRETS

by Robert Ainsbury Optimize DOS 6 for maximum performance with this treasure chest of SECRET DOS workarounds, tips, & hands-on solutions. All new coverage of DOS 6 file compression, disk optimization, defragmentation, and memory management. Includes two 3 1/2" disks of "Bob's Better Than DOS" shareware -over 25 utilities!

1-878058-70-3 \$39.95 US/\$52.95 Canada, includes two 3 1/4" disks

The World of

Computer

BOOKS Knowledge

Let IDG's Authorized Editions show you how to make the most of your computer. Find them at your local book or computer store or call: 1-800-762-2974.

In Canada, call Macmillan of Canada at 416-293-8141.

For Dummies and SECRETS" are trademarks of IDG Books Worldwide, Inc.

155 Bovet Road San Mateo, CA 94402

IDG Books Worldwide

415 312-0600

Uninstallium Practicalus

emember the good old days?
Every DOS program came with a convenient, free, easy-to-use uninstall routine—DEL *.*. A really complicated operation might've involved removing a directory and deleting some lines from your AUTOEXEC or CONFIG files, but that was as difficult as it got.

Well, Bunky, if you've switched to Windows, you know those days are over. Many Windows applications install themselves into half a dozen new directories scattered across your hard disk, add a heap of new DLL files to your WINDOWS directory, and insert dozens of new lines into WIN.INI.

Hope, I'm glad to say, has sprung, in the form of some smart utilities that'll rid your computer of unwanted Windows programs—along with their bazillion unidentified support files. And as a fringe benefit, you'll get a better grasp on how Windows works.

The highest marks go to MicroHelp's The UnInstaller, a brilliant utility that cleans up after an application as it removes it. When you select a program, detailed analysis lets you know where the program and help files reside, if the program has its own INI file, and which Program Manager icons exist. The \$79 UnInstaller also ferrets out DLLs and items added to WIN.INI. Then with just a click of the mouse, they're gone. Adios. Hasta luego.

Windows Without a Clue

Because I don't have a clue about half of those files in my Windows directory, I was reticent about using The UnInstaller, afraid I might unintentionally delete something I need. Not a chance—The UnInstaller has more safeguards than a monitor has pixels. For example, it has a reassuring "Confirm all Deletions" choice and it's smart enough to stop you from uninstalling

By Steve Bass

essential Windows programs like PIFEDIT or WINFILE. After it's done, The UnInstaller can report on what items it removed and what you didn't allow it to remove. Using The UnInstaller's browse mode, I was able to get rid of more than 5MB of long-unused Windows programs that I'd forgotten I even owned. Now if the utility could only remove the excess DLLs left from applications I erased before I got The UnInstaller.

and are willing to do more work to earn it, you can use *Uninstall for Windows*. You must run this program before and after you install a new *Windows* app, letting it take a snapshot of your entire system. The program can then compare the "old" system to the "new" so you'll know what's changed. *Uninstall for Windows*, available as UN4WIN.ZIP on PC World Online and other on-line services, isn't

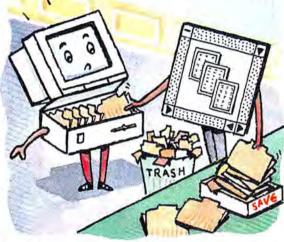
particularly elegant. But it's only \$19,

and it's try-before-you-buy shareware.

If you're looking for a bargain,

A Back Door to Windows

Using The UnInstaller had an unexpected advantage: It gave me a glimpse into the inner workings of Windows. I now know, for example, which DLLs are shared by multiple programs and how many programs create their own INI files. This sparked my curiosity. To learn more about Windows (and do some safe tinkering) I started playing with a pre-release copy of Windows User Group Network's System Engineer, an incredibly comprehensive utility that lets me snoop into-and modify-just about every part of Windows. Among other things, I was able to explore my Windows communications setup, tweak my 386 memory settings, and even set a log to record the last 100 changes to my system. Being a bit fainthearted, I was glad that System Engineer has an option to let me experiment without any



chance of doing harm.

If System Engineer had nothing but its help and tutorial files and its ability to troubleshoot a problem, it would still be worth the price. The Help system includes not only a comprehensive glossary and flowchart of Windows functions, but took me on an amazing tour of System Engineer's own options. And as for troubleshooting, the WUGNET program easily helped me solve a problem I had been experiencing with the mouse when

WHERE TO BUY

Uninstall for Windows \$19, It's Your Money Inc.; CIS 72621,2222; America Online "IYM."

Reader service no. 722

The Uninstaller \$79, MicroHelp Inc.; 800/922-3383, 404/516-0899, 404/516-1099 (fax). Reader service no. 723

System Engineer \$49.95 (free with WUGNET membership), Windows User Group Network; 215/565-1861, 251/585-7016 (fax). Reader service no. 724

I was in windowed DOS programs.

It's June, time for garage sales and weeding the yard. With programs like these, you can clean your Windows too.

Contributing Editor Steve Bass is the president of the Pasadena IBM Users Group. He can be reached as PCW STEVE, on PC World Online (see page 10 for more information).



\$99. NO, IT'S NOT A TYPO.

(SORRY COMPAQ.)

SAVE \$200

DELL PERFORMANCE SERIES 333s/L BUSINESS LEASE: \$37/MO.

Contrary to many systems you see advertised for under \$1,000, ours comes complete with a VGA color monitor (14", 640 x 480, .31mm). Plus and 80MB hard drive. Plus 2MB RAM. Plus one diskette drive. Plus MS-DOS, Microsoft* Windows 3.1, and a mouse. Plus 3 ISA expansion slots. Plus 256KB video RAM. Quite a few pluses, wouldn't you say?

CALL AND ORDER TODAY, OFFER EXPIRES 6/30/93.

There's no mistake about it. For a limited time only, you can get



the fastest Dell 386SX made for under \$1,000. (That means you'll save up to \$200.) And it comes complete with a VGA color monitor.

What's more, you also get guaranteed on-site service, and technical support 24 hours a day, 7 days a week-with guaranteed telephone response in under five minutes. All of which shouldn't surprise you since we were the winner of the latest Dataquest Customer Satisfaction Survey, helping us to become the world's third largest industry-standard PC company.

Speaking of fast, take advantage

of our quick shipment program. That way you can receive your new system within three days of ordering it.

So call and order today. Offer expires 6/30/93. Which is one thing in this ad Compaq will be happy to hear.

D&LL 800-433-7309

WHEN CALLING, PLEASE REFERENCE #11DAZ.
HOURS: 7AM-9PM CT MON-FRI,
BAM-4PM CT SAT, 10AM-3PM CT SUN.

WE'RE MAKIN THEY'RE CHECK

	DELL 425s/L	COMPAQ ProLinea 4/25s
UPGRADEABLE TO PENTIUM	1	
TECHNOLOGY		
FLASH ROM BIOS		
FLASH ROM EMBEDDED	V	
DIAGNOSTICS		
128KB EXTERNAL CACHE OPTION		
MODULAR CHASSIS DESIGNED FOR	1	
EASY SERVICEABILITY		
64MB MAXIMUM RAM		
ON SYSTEM BOARD	•	
LOW PROFILE CHASSIS WITH 3 DRIVE		
BAYS AND 3 ISA EXPANSION SLOTS	•	
GUARANTEED" NEXT-BUSINESS-DAY		
ON-SITE SERVICE		
	1	1
UP TO 1MB VIDEO RAM		



"Guarantees available in USA only for registered owners of Dell Performance Series systems purchased after 7/1/92. For a complete copy, please call our TechFax™ line at 1-800-950-1329 or write Dell USA L.P., 9505 Arboretum Bled., Austin TX 78759-7299. Attention Guarantees, "Sonce Dacquest, Inc. 1992. "Prices valid in U.S. only. Some products and promotions rost available in Canada or Messico. "Leasing arranged by Leasing Group, Inc. 40n-site service provided by BancTee Service Corporation. On-site service may not be available in Certain remote areas. The Intel Inside logo is a registered trademark and 1886, 1486 and Pentium are trademarks of Intel Corporation. MS-DOS and Microsoft are registered trademarks of Microsoft Corporation. Dell disclaims proprietary interest in the marks and names of others. €1993 Dell Computer Corporation. All rights reserved.

GALISTAND INGITTWICE.

Buy any Dell system and we'll install your software right at our factory. It's called Dell ReadyWare." With 20 diskettes and 2 hours to load and configure just one system, imagine the time you'll save and the hassles you'll avoid. In fact, we have over 50 competitively priced popular software applications to choose from.

Just order MS-DOS 6.0, Microsoft ReadyWare Windows 3.1 (for Windows applications), and your ReadyWare choices when you order your Dell Performance Series system.

We'll install as many applications as you need for just \$15. So make a note of it.



THE DELL 333s/L i386" SX 33MHz SYSTEM \$999"

BUSINESS LEASE: \$37/MO.
2MB RAM

BOMB (17ms) HARD DRIVE

3 ISA EXPANSION SLOTS
256KB VIDEO RAM
VGA COLOR PLUS
(14", 640 x 480, .31mm)
ONE DISKETTE DRIVE
(3.5" or 5.25")
MS-DOS 6.0

*WHILE SUPPLIES LAST.

MICROSOFT WINDOWS 3.1

MOUSE



THE DELL 450/L i486 DX2 50MHz SYSTEM

\$2,299

BUSINESS LEASE: \$85/MO.

4MB RAM

230MB (17ms) HARD DRIVE

FLASH ROM EMBEDDED DIAGNOSTICS

3 ISA EXPANSION SLOTS

UPGRADEABLE TO
PENTIUM TECHNOLOGY

ACCELERATED LOCAL BUS
VIDEO WITH 1MB VIDEO RAM

ULTRASCAN 14C MONITOR

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

ONE DISKETTE DRIVE

(3.5" or 5.25")

MS-DOS 6.0



THE DELL 450/M i486 DX2 50MHz SYSTEM

\$2,499

BUSINESS LEASE: \$92/MO.

4MB RAM

170MB (17ms) HARD DRIVE

128KB EXTERNAL CACHE
FLASH ROM EMBEDDED DIAGNOSTICS
6 ISA EXPANSION SLOTS

UPGRADEABLE TO
PENTIUM TECHNOLOGY

ACCELERATED LOCAL BUS
VIDEO WITH 512KB VIDEO RAM

ULTRASCAN 14C MONITOR [14", 1024 x 768, 28mm, NI) ONE DISKETTE DRIVE (3.5" or 5.25") MS-DOS 6.0



THE DELL 466/ME i486 DX2 66MHz SYSTEM

\$3.599

BUSINESS LEASE: \$130/MO.

8MB RAM

450MB (12ms) HARD DRIVE
128KB EXTERNAL CACHE
FLASH ROM EMBEDDED DIAGNOSTICS
2 ISA EXPANSION SLOTS
4 EISA EXPANSION SLOTS
UPGRADEABLE TO
PENTIUM TECHNOLOGY
ACCELERATED LOCAL BUS VIDEO
WITH 1MB VIDEO RAM
ULTRASCAN 14C MONITOR
(141: 1024 × 768. 28mm. NI)

(3.5" or 5.25")
MS-DOS 6.0



THE DELL 425s/L i486 SX 25MHz SYSTEM

\$1,599

BUSINESS LEASE: \$59/MO.

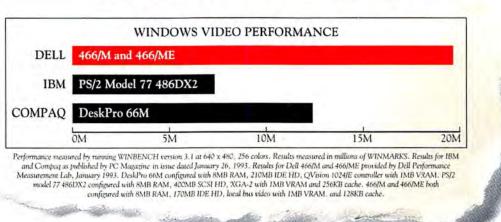
4MB RAM • 170MB (17ms) HARD DRIVE • FLASH ROM EMBEDDED DIAGNOSTICS
• UPGRADEABLE TO PENTIUM TECHNOLOGY • ACCELERATED LOCAL BUS VIDEO
WITH 512KB VIDEO RAM • ULTRASCAN 14C MONITOR [14] 1024 x 768, .28mm, NI)
• DUAL DISKETTE DRIVES (3.5" AND 5.25") • MS-DOS 6.0/MICROSOFT WINDOWS/MOUSE
PROMOTIONAL PRICE: OFFER EXPIRES 7/31/93



800-433-7830

WHEN CALLING, PLEASE REFERENCE #11DBA HOURS: 7AM-9PM CT MON-FRI, 8AM-4PM CT SAT, 10AM-3PM CT SUN. IN CANADA; CALL 800-668-3021

COMPAQ'S AND IBM'S VIDEO IS BEHIND THE TIMES.



Our Dell 466/M and 466/ME with over 19 million WINMARKS, outran the Compaq DeskPro 66M with QVision and IBM PS/2 Model 77 486 DX2 with XGA-2.That means we're up to 57% faster than QVision and up to 174%



faster than XGA-2. Thanks, of course, to our accelerated local bus video and fast drivers for Windows applications. Both help put the Dell* 466/M a little ahead of its time. THE DELL 466/M i486™ DX2 66MHz SYSTEM

\$3,149

BUSINESS LEASE®: \$117/MO.

8MB RAM • 230MB (17ms) HARD DRIVE • 128KB EXTERNAL CACHE
• FLASH ROM EMBEDDED DIAGNOSTICS • 6 ISA EXPANSION SLOTS
• UPGRADEABLE TO PENTIUM ** TECHNOLOGY • ACCELERATED LOCAL BUS VIDEO
WITH 1MB VIDEO RAM • ULTRASCAN ** 14C MONITOR (14*, 1024 x 768, .28mm, NI)
• ONE DISKETTE DRIVE (3.5" OR 5.25") • MS-DOS* 6.0

OR CHOOSE THE 466/ME EISA SYSTEM FOR ONLY \$200 MORE



800-433-7308

WHEN CALLING, PLEASE REFERENCE #11DF3.

HOURS: 7AM-9PM CT MON-FRI, 8AM-4PM CT SAT, 10AM-3PM CT SUN.
IN CANADA; CALL 800-668-3021. IN MEXICO CITY; 228-7811